Seven prominent figures in the global climate change policy discourse published an opinion essay in *Nature*. In "Three years to safeguard our climate," they set a deadline for key targets to be met in order to stay on track to meet the Paris Agreement's global warming goals. The notable thing is that the essay was published three years ago this week:

> The year 2020 is crucially important for another reason, one that has more to do with physics than politics. … should emissions continue to rise beyond 2020, or even remain level, the temperature goals set in Paris become almost unattainable… The good news is that it is still possible to meet the Paris temperature goals if emissions begin to fall by 2020.

Image by geralt at pixabay

The authors are well-known. The essay's lead author, Christiana Figueres, was previously Executive Secretary of the UN Framework Convention on Climate Change and oversaw the Paris Agreement's creation. Johan Rockström led the development of the influential "planetary boundaries" theory of sustainability, was the director of the Stockholm Environment Institute, and is now joint director of the Potsdam Institute for Climate Impact Research (PIK). Hans Joachim Schellnhuber was PIK's founding director and helped establish the planetary boundaries theory. They are joined by more than 60 co-signatories [PDF]. Where do the authors' targets stand? As quoted above, their top-level objective is that greenhouse gas emissions must decline by this year. Although emissions continued to rise through 2019, they will decline this year *not* due to climate policies but because of the coronavirus slowing the global economy. When the economy rebounds, so too will emissions.

In fact, they are already rebounding. According the a recent *New York Times* article:

> But by mid-June, as countries eased their lockdowns, emissions had ticked up to just 5 percent below the 2019 average, the [scientific article's] authors estimated in a recent update. Emissions in China, which accounts for one-quarter of the world's carbon pollution, appear to have returned to pre-pandemic levels. The study's authors said they were surprised by how quickly emissions had rebounded. But, they added, any drop in fossil fuel use related to the coronavirus was always likely to be temporary unless countries took concerted action to clean up their energy systems and vehicle fleets as they moved to rebuild their ailing economies.

In their *Nature* essay, Figueres et al go on to offer six specific targets that must be met this year. Let's look the latest figures for these criteria:

> By 2020, here's where the world needs to be: Energy. Renewables make up at least 30% of the world's electricity supply — up from 23.7% in 2015. No coal-fired power plants are approved beyond 2020, and all existing ones are being retired.

At the source that they cite for 2015, the latest figure is 26.4% of electricity coming from renewables in 2019. Extrapolating the trend linearly, renewables may reach 28.2% in 2020 — not quite 30%. Regarding new coal-fired power plants, in 2019 the world added 68 GW of coal-fired capacity, two-thirds of which was in China. (A one is about 600 MW, so this implies about 110 such coal-fired plants) Plenty more are in the construction pipeline worldwide. For example, Japan — which has essentially ended its use of nuclear power, which once provided a third of its electricity — plans to build 22 coal-fired plants.

> Infrastructure. Cities and states have initiated action plans to fully decarbonize buildings and infrastructures by 2050, with funding of $300 billion annually. Cities are upgrading at least 3% of their building stock to zero- or near-zero emissions structures each year.

I am unsure where to find data for these precise processes, such as "initiat[ing] action plans." However, greenhouse gas emissions from buildings reached a record high in 2019, while "incremental spending on energy efficiency investments amounted to over USD 150 billion," only half of Figueres et al's target. The International Energy Agency concludes that "Energy efficiency investments [in buildings] are still not keeping pace with construction." Regarding upgrading building stock, the global renovation rate in 2019 was

less than 1.5%. This implies that upgrading building stock to zero- or near-zero emissions is even lower than this value, or less than half of Figueres et al's target.

> Transport. Electric vehicles make up at least 15% of new car sales globally, a major increase from the almost 1% market share that battery-powered and plug-in hybrid vehicles now claim. Also required are commitments for a doubling of mass-transit utilization in cities, a 20% increase in fuel efficiencies for heavy-duty vehicles and a 20% decrease in greenhouse-gas emissions from aviation per kilometre travelled.

In 2019, electric cars were 2.6% of global new car sales, about one-sixth of Figueres et al's goal. Their second sentence concerns "commitments," which are difficult to measure but matter much less than actual progress. (I have committed to exercising every day, but still do not do so.) What's more, the authors give no dates for their desired commitments. (With respect to the global use of public transit, it has recently plummeted due to the coronavirus, and might take quite some time to recover.)

> Land. Land-use policies are enacted that reduce forest destruction and shift to reforestation and afforestation efforts. Current net emissions from deforestation and land-use changes form about 12% of the global total. If these can be cut to zero next decade, and afforestation and reforestation can instead be used to create a carbon sink by 2030, it will help to push total net global emissions to zero, while supporting water supplies and other benefits. Sustainable agricultural practices can reduce emissions and increase CO2 sequestration in healthy, well-managed soils.

The first sentence concerns policies, which are again hard to measure. And the authors do not say how many or which countries must enact such policies. Looking at the intended effect, the change in global forest cover remains net negative, although this rate has slowed to half of its peak. Net carbon dioxide emissions from re-, af-, and deforestation as well as land-use changes have been roughly steady for years at around 14% of total emissions (but did increase in 2019 due to large forest fires). The rest of Figueres et al's paragraph regards 2030 and general observations.

> Industry. Heavy industry is developing and publishing plans for increasing efficiencies and cutting emissions, with a goal of halving emissions well before 2050. Carbon-intensive industries — such as iron and steel, cement, chemicals, and oil and gas — currently emit more than one-fifth of the world's CO2, excluding their electricity and heat demands.

Whether or not "heavy industry" this year has a goal for 2050 is not very relevant. Issuing long-term goals is much easier than actually meeting either them or short-term ones. The authors' second sentence is difficult to parse. Does "current" mean 2017 or 2020? Why does heavy industry's portion of total emissions even matter if one hopes that all sectors' emissions will decrease? Either way, I cannot find values for industry's share of global emissions more recent than 2016.

> Finance. The financial sector has rethought how it deploys capital and is mobilizing at least $1 trillion a year for climate action. Most will come from the private sector. Governments, private banks and lenders such as the World Bank need to issue many more 'green bonds' to finance climate-mitigation efforts. This would create an annual market that, by 2020, processes more than 10 times the $81 billion of bonds issued in 2016.

In 2018 — the most recent year for which I could find numbers — climate finance was $546 billion. It is increasing rapidly and roughly linearly, at which rate it might be about $700 billion in 2020, significantly short of Figueres et al's goal of $1 trillion. Meanwhile, "green bonds" appear to be $175 billion (also in 2018) and perhaps $255 billion (in 2019), a far cry from the authors' goal of $810 billion (in 2020).

To summarize: Figueres et al's headline objective of declining greenhouse gas emissions will be met this year, but this is due to the coronavirus. Emissions will presumably rebound in within a year or two, although 2019 may (hopefully) turn out to be the year of peak global emissions. According to the latest data that I found, none of their specific criteria have been achieved, many fall dramatically short, and none are on track to be met.

What does failing (*completely*) to meet these targets mean? In the case of these authors, Figueres et al imply — but do not outright say — that the Paris Agreement's global warming goals can no longer be met. However, they carefully used language such as "the temperature goals set in Paris become *almost* unattainable" and, in the press release, "the world… *may be* fatally wounded by negligence until 2020" (emphasis added) . Likewise, they attach no direct consequences to their statement "By 2020, here's where the world needs to be."

More generally, this sort of "deadlinism"– in my opinion — harms efforts to prevent dangerous climate change. To be clear, I understand that deadlines such as the one examined here are meant to motivate action. But short-term deadlines invite dangerous emergency-based thinking. And the last half-century of environmentalism is littered with too many alarmist deadlines that were not met and whose forecast doom never manifested. In

the past, it was Paul Ehrlich who, in 1968, wrote "[i]n the 1970s hundreds of millions of people will starve to death in spite of any crash programs embarked upon now." Or in 2006, "unless drastic measures to reduce greenhouse gases are taken within the next 10 years, the world will reach a point of no return, [former US vice president Al] Gore said." More recently, it was claims (even from the President of the UN General Assembly) that "We have 12 years to limit climate change catastrophe," a widespread misrepresentation or misinterpretation of the findings of the Intergovernmental Panel on Climate Change. Supporters of efforts will become unduly despondent. After all, if the assertions of deadlines are true and we have passed a point of no return, why should even try? Furthermore, opponents of these efforts use the missed deadlines as effective political weapons, undermining environmentalists' credibility. This is especially likely if advocates, such as the authors here, move the goalposts by extending the deadline — which seems likely.