

THE REALITIES OF CLIMATE CHANGE



ISSUE BRIEF BY **MARK PAUL, ANDERS FREMSTAD, AND J.W. MASON** | JUNE 2019

It's clear that the global community must rapidly curtail its greenhouse gas (GHG) emissions immediately. According to the recent Intergovernmental Panel on Climate Change (IPCC) report, written by top scientists from around the world, if society is to have a reasonable chance at limiting warming to 1.5 degrees Celsius (2.7 degrees Fahrenheit) then global net emissions must be reduced by 45 percent by 2030 and reach net zero around 2050 (IPCC 2018). This would represent a sharp break from our current trajectory, which has us on track to surpass 4°C by 2100.

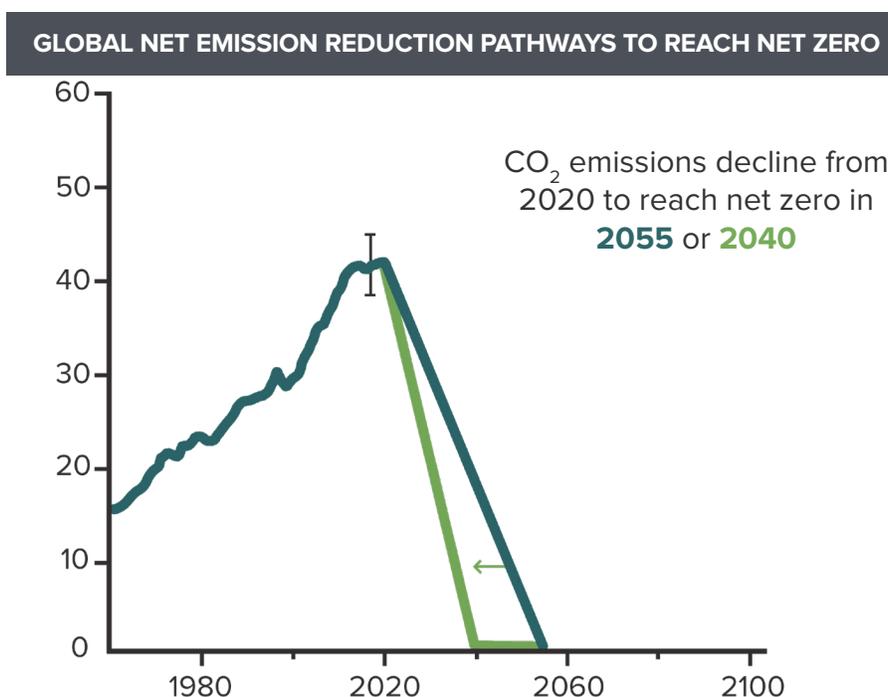


FIGURE 1 According to the IPCC 2018 report, global net emissions must decline rapidly to have a likely chance of limiting global warming to 1.5°C. Faster reductions in CO₂ emissions, shown in blue, help limit cumulative CO₂ emissions and improve the likelihood of limiting warming to 1.5°C. The y axis represents Billions of Tonnes of CO₂ per year
Source: <https://www.ipcc.ch/sr15/chapter/summary-for-policy-makers/>

Scientists warn that inaction would be devastating. First, as warming continues to occur, natural feedback loops will exacerbate warming trends. In other words, there are thresholds of warming that will automatically unleash waves of additional warming by altering some of Earth's natural systems. For instance, ice is light in color and extremely reflective, but the ocean's surface is dark and absorbs heat. As the planet continues to warm and ice melts, the oceans will absorb additional heat, which will cause the planet to warm faster. Additionally, there may be what climate scientists call "tipping points," which are thresholds that, when exceeded, move the Earth abruptly beyond its steady state, bringing about catastrophic climate events. One of the troubling tipping points may come as permafrost is thawed due to warming, which will then release methane—an incredibly potent GHG.



Inaction will also lead to preventable declines in the health and well-being of many communities, as well as the absolute destruction of some communities, with those burdens disproportionately placed on vulnerable groups. Estimates show that reckless climate inaction would lead to significantly worse air quality, resulting in additional cases of asthma and other respiratory problems that are major killers, as well as mounting heat-related deaths that could amount to \$141 billion in damages alone (NCA4 2018). Globally, the World Health Organization (WHO) estimates that approximately 250,000 deaths annually would be related to climate change from 2030 to 2050 (WHO 2014). A thorough look at health benefits shows that the costs of limiting warming from 1.5 to 2°C, which includes limiting harmful co-pollutants released by fossil fuels combustion, would be fully offset by the value of these health benefits alone (Shindell et al. 2016).

Beyond the devastating environmental and health impacts of inaction, scientists and economists estimate that the economic impacts of global warming are going to be immense. In a recent paper published in *Nature*, researchers found that a world that warmed 3°C by 2100 would reduce global GDP by roughly 10 percent compared to a world where the earth warmed by 2°C (Burke et al. 2018). A 2°C increase, however, would also result in major economic costs. They estimate that limiting warming to 1.5°C rather than 2°C would save the global economy roughly \$20 trillion by 2100. Estimates by the Federal Reserve Bank of Richmond, and reported in the “Fourth National Climate Assessment,” also demonstrate that all aspects of the US economy are threatened by global warming and that warming along the current trajectory could cost the US economy upwards of 10 percent of GDP by the end of the 21st century. To put this into perspective, that’s more than double the economic losses from the Great Recession—but the damage in this case has no chance of being undone (Global Change 2018; Colacito et al. 2016).

The irreversible nature of climate change demands that we act boldly now to minimize warming. Even if we reorient politics and policymaking, resulting in large cuts in emissions, it will not lead to reductions in concentrations of GHG emissions in the atmosphere as long as new emissions outpace the removal of carbon dioxide from the atmosphere. Thus, we must not only rapidly reduce new emissions, but we must also consider pathways to reduce concentrations of emissions in the atmosphere.

Climate change represents the greatest threat humanity has ever faced. We can, however, act now to rapidly change our ways and secure a safe and stable climate for current and future generations. Building a climate resilient and economically equitable future comes down to making the right policy choices and demonstrating a clear commitment to collective, broad-based action.

Read the [*Decarbonizing the US Economy: Pathways Toward a Green New Deal*](#) report to learn more.



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