

# New climate pledges likely to prevent worst of global heating

November 5 2021, by Hayley Dunning

---



Credit: CC0 Public Domain

If fulfilled, climate pledges made in the last six years have a much better chance of reaching globally agreed temperature goals.

Over 100 nations have issued new commitments to reduce [greenhouse gas emissions](#) ahead of the United Nations Conference of the Parties, or COP26, currently underway in Glasgow.

A new analysis published today in the journal *Science* assessed those new pledges, or nationally determined commitments (NDCs), and how they could shape Earth's climate. The authors of the study, from institutions led by the Pacific Northwest National Laboratory and including Imperial College London, find the latest NDCs could chart a course where limiting [global warming](#) to 2°C and under within this century is now significantly more likely.

Under pledges made at the 2015 Paris Agreement, the chances of limiting temperature change to below 2°C and 1.5°C above the average temperature before the industrial revolution by 2100 were 8 and 0 percent, respectively.

Under the new pledges—if they are successfully fulfilled and reinforced with policies and measures of equal or greater ambition—the study's authors estimate those chances now rise to 34 and 1.5 percent, respectively. If countries strike a more ambitious path beyond 2030, those probabilities become even more likely, rising to 60 and 11 percent, respectively.

Further, the chance of global temperatures rising above 4°C could be virtually eliminated. Under the 2015 pledges, the probability of such warming was more likely, at around 10 percent probability.

The researchers used an open-source model called the Global Change Analysis Model (GCAM) to simulate a spectrum of emissions scenarios. They then used a climate model calibrated to the findings of the latest climate report of the Intergovernmental Panel on Climate Change (IPCC) to evaluate the probabilistic temperature outcomes for those

scenarios.

At one end of the spectrum is a hypothetical future in which current climate mitigation measures and policies remain largely the same through 2100. At the other, nations commit to more ambitious targets for limiting emissions and increasing the global decarbonization rate. Such modeling illustrates the range of climate outcomes that lie beyond different courses of action.

Co-author Dr. Joeri Rogelj, director of research for the Grantham Institute at Imperial, said: "To deal with climate change we need to understand future climate risks. There is no one and only temperature number, so we need to look at how our decisions today increase our chances that warming is kept under 2 degrees and 1.5 degrees.

"The good news is, in our study we show how some of the most extreme futures can be excluded if current pledges are followed. But these pledges are still not yet sufficient to meet the goals of the Paris Agreement, and COP26 still has an important task in front of them. If we're serious about getting to 1.5 degrees, the pledges need to be further strengthened.

"Ultimately, realizing the long-term climate benefits described in this study will require putting words into action by implementing these newer and enhanced targets. When we look at the climate action data on the ground, it doesn't yet match up with the stated ambition in the pledges."

Several factors reshaped near-term emissions trajectories and long-term [climate](#) outcomes, the authors said. Examples include the worldwide shift away from coal to technological advances that made solar panels and electric vehicles less costly. These developments, they said, have helped bring the goals of the Paris Agreement closer to fruition.

Even under a scenario in which no new emission mitigation policies take place through 2100, this century's emissions are projected to be lower than previous estimates, largely due to post-2015 developments like reduced coal power investment and the reduced cost of renewable energy.

Co-lead author and Pacific Northwest National Laboratory research scientist Dr. Gokul Iyer said: "New commitments, [technological advances](#), and the near- and long-term recovery from the pandemic have set us on a different course than what laid before us at the 2015 Paris Agreement.

"But if we adopt more ambitious goals that truly reflect the common but differentiated responsibilities across all parties, that gives us a better than even chance of staying under 2 degrees Celsius."

**More information:** Navroz K. Dubash et al, National climate institutions complement targets and policies, *Science* (2021). [DOI: 10.1126/science.abm1157](https://doi.org/10.1126/science.abm1157)

Provided by Imperial College London

Citation: New climate pledges likely to prevent worst of global heating (2021, November 5) retrieved 10 April 2024 from <https://phys.org/news/2021-11-climate-pledges-worst-global.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--