

*MCC Press Release*

## Scientists caution no guarantees when it comes to overshooting 1.5°C

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A study co-authored by MCC analyses scenarios in which we temporarily exceed this limit and bring temperatures back down later. Rapid emission reductions are essential.

**Berlin, 09/10/2024.** Even if it is possible to reverse the rise of global temperatures after a temporary “overshoot” of 1.5 degrees Celsius (°C), some climate damages triggered at peak warming, including rising sea levels, will be irreversible. This is shown in a study by 30 scientists, co-authored by the Berlin-based climate research institute MCC (Mercator Research Institute on Global Commons and Climate Change). It is the culmination of a three-and-a-half-year project, backed by the European innovation fund HORIZON2020, looking at overshoot scenarios where temperatures temporarily exceed the Paris Agreement’s 1.5°C limit, before descending again by achieving net-negative CO<sub>2</sub> emissions. The study has been published today in the renowned journal *Nature*.

“This paper does away with any notion that overshoot would deliver a similar climate outcome to a future in which we had done more, earlier, to ensure to limit peak warming to 1.5°C,” commented Carl-Friedrich Schleussner. He is a group leader at the research institute IASA in Laxenburg near Vienna, scientific advisor at the Berlin-based Climate Analytics institute, and lead author of the study. “Only by doing much more in this critical decade to bring emissions down and peak temperatures as low as possible, can we effectively limit damages.”

If we were to exceed 1.5°C, there are clear benefits to reversing warming by acting to achieve net negative emissions globally. Achieving long-term temperature decline could lower sea level rise in 2300 by about 40 centimetres compared to a situation in which temperatures merely stopped rising. “The results of the analysis show that in addition to ambitious emission reductions, atmospheric carbon removals are increasingly needed to steer back from an overshoot”, says [Sabine Fuss](#), Co-Chair of MCC and co-author of the study. “Given the currently limited sustainable potential, this leads to a major challenge in scaling up removal methods. And we really need to minimise our residual emissions that we can’t squander our scarce removal potentials on.”

The study emphasises that while there are still pathways open to limiting warming to 1.5°C or lower in the long run, there is a need to “hedge” against higher warming outcomes if the climate system warms more than median estimates. A “preventive capacity” of several hundred gigatonnes of net removals might be required. “Until we get to net zero, warming will continue,” commented co-author Joeri Rogelj, Professor of Climate Science & Policy at Imperial College London. “The earlier we can get to net zero, the lower peak

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warming will be, and the smaller the risks of irreversible impacts. This underscores the importance of countries submitting ambitious new reduction pledges well ahead of next year's climate summit in Brazil.”

**Reference of the cited article:**

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