Press Release

Climate Geoengineering Cannot Save the Paris Agreement

But climate goals can still be reached if CO_2 emissions are cut drastically

In order to avert the worst consequences of climate change, the Paris Climate Agreement aims to limit global warming to well below 2°C and, if possible, to 1.5°C. But this goal will only be achieved if the signatory states reduce their emissions considerably more than they have pledged so far under the agreement. Could climate geoengineering be a Plan B if they fail to deliver? A team of authors led by IASS Scientific Director Mark Lawrence argue in an article just published in Nature Communications that the proposed technologies cannot be relied on to rescue the Paris Agreement and the 2°C goal.

In order to achieve the 2°C goal, emissions of CO_2 and other greenhouse gases would need to be reduced by roughly 50% per decade. However, the emissions reductions pledged so far by countries in the framework of the Paris Agreement fall far short of this: Indeed, CO_2 emissions are currently expected to stay about constant or even increase until 2030. This discrepancy has fuelled discussion on the potential risks and benefits of targeted interventions in the climate system: so-called climate geoengineering technologies aim to actively remove CO_2 from the atmosphere, reflect sunlight away from Earth, or modify cirrus clouds in order to allow more terrestrial infrared radiation to escape to space.
But all of these technologies are fraught with uncertainty. According to the authors, considerable further research would be needed to more accurately assess each of the proposed techniques in terms of their cooling potentials, as well as their costs and risks for Earth systems and society. Many of these technologies would also require investments in massive infrastructures and resources, and the development of complex international governance frameworks.

Extensive emissions reductions are the only way to achieve the Paris Climate Agreement

“None of the proposed climate geoengineering techniques is realistically likely to be deployable on a global scale within the coming decades. In other words, these technologies cannot be relied on to make significant contributions towards achieving the 2°C goal – let alone the 1.5°C goal”, explains lead author Mark Lawrence. If climate geoengineering techniques ever worked as envisioned, they would very likely not be implementable prior to the second half of the twenty-first century. Significantly strengthening measures to reduce emissions of CO_2 and other climate forcers remains the only reliable way to achieve the goals of the Paris Agreement.

Critical discussions ward against false hopes

In the article, the team of authors goes beyond reviewing the technical capacities of various proposals to also offer a critical perspective on the current political situation and the public discourse on climate geoengineering. “Climate geoengineering is already entering the collective imagination, especially through the media and climate policy discussions”, emphasises co-author Stefan Schäfer (IASS). “If approached uncritically, there is a danger that it will come to be seen as an alternative to emission reductions.” A spirited and open discourse is needed, underpinned by solid scientific evidence such as the research conducted through the German Research Foundation’s priority programme on climate engineering, in order to develop a realistic assessment of these technologies. Events such as the international Climate Engineering Conferences organised by the IASS in 2014 and 2017 provide an entry point for diverse societal groups to engage with this discourse.

Mark G. Lawrence, Stefan Schäfer, Helene Muri, Vivian Scott, Andreas Oschlies, Naomi E. Vaughan, Olivier Boucher, Hauke Schmidt, Jim Haywood & Jürgen Scheffran: Evaluating climate geoengineering proposals in the context of the Paris Agreement temperature goals, Nature Communications, volume 9, Article number: 3734 (2018)

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