

As Paris climate goals recede, geoengineering looms larger

October 11 2017, by Marlowe Hood



Scientists gathered in Berlin this week are examining viable ways to geoengineer the climate to cope with rising greenhouse gas emissions

Even if you are terrified of heights, jumping out of a plane with a makeshift parachute may begin to look like a good idea once you know the aircraft is running out of fuel.

That, arguably, is akin to the mindset of climate scientists and policymakers brainstorming in Berlin this week on how to compensate for humanity's collective failure to curb the greenhouse gases—caused mainly by burning fossil fuels—that drive global warming.

In 2015, 195 nations miraculously, if belatedly, vowed to cap the rise of the Earth's average surface temperature at "well below" two degrees Celsius (3.6 degrees Fahrenheit), and to make a good-faith effort to hold the line at a 1.5 C.

But the Paris Agreement did not mandate how or when to hit those targets.

With a single degree Celsius of warming so far, a crescendo of impacts—including tropical storms engorged by rising seas, along with deadly heatwaves, fires and droughts—suggest that time is not on our side and that the range of options is narrowing.

"It has become very clear that getting to 2 C, and especially 1.5 C, is very dependent on our ability to remove large amounts of CO₂ from the atmosphere," Naomi Vaughan, a [climate scientist](#) at the University of East Anglia, told the opening plenary of the Climate Engineering Conference 2017.

Indeed, 90 percent of projections in the UN climate science panel's most recent report that would keep the planet under the 2 C threshold depend heavily on such "negative emissions". (The others assume [greenhouse gas emissions](#) peaked in 2010, when in fact they are still climbing.)

"It is a matter of considerable concern that we are not sure how to do this" on the scale needed, Myles Allen, head of the University of Oxford's Climate Research Programme, told AFP.

Deflecting sunlight

Michael Taylor, an atmospheric scientist from the University of West Indies, underscored the urgency in the aftermath of the two Category Five hurricanes—projected to increase in frequency—that recently ravaged the Caribbean.

"The region's climate will be so significantly altered that it will not just be unfamiliar," he told colleagues. "It will be unprecedented."

One of two broad categories under the geoengineering umbrella, carbon dioxide removal (CDR) schemes include "enhanced weathering" of rocks that soak up CO₂; large-scale production of charcoal from organic waste; sequestering CO₂ cast off from burning biofuel plants; and sucking carbon dioxide directly from the air with high-tech machines.

Even the massive planting of trees—which store CO₂ as they grow—is seen as part of the "CDR" arsenal.

The other, far more controversial approach to climate engineering, known as solar radiation management, would deflect enough sunlight back into space to cool the planet a degree or two.

This, proponents say, could be done by injecting billions of tiny reflective particles into the stratosphere, or chemically brightening mirror-like ocean clouds.

"It will be very difficult to meet the Paris Agreement goal of even staying below 2 C without resorting to at least one, if not both, of these forms of climate engineering," said Mark Lawrence, scientific director of the Institute for Advanced Sustainability Studies in Potsdam, Germany, which is hosting the four-day conference.

Impacts on a planetary scale

Some scientists think [climate engineering](#) of any kind is a slippery slope.

"It diverts attention away from the need to reduce emissions," Jean-Pascal van Ypersele, a professor at the Catholic University of Louvain in Belgium, and a former vice-chair of the UN Intergovernmental Panel on Climate Change, told AFP.

"CO2 removal gives the illusion that we can continue using fossil fuels indefinitely," he said.

Other experts who have reluctantly embraced the necessity of geoengineering to help fix the [climate](#) are more nervous about fiddling with the sun's radiative force.

"This is the first time since the development of nuclear weapons that we have a set of technologies which has the potential of impacting Earth, as well as human society, at a planetary scale," said Arunabha Ghosh, chief executive of the Council on Energy, Environment and Water in New Delhi.

Solar radiation management could disrupt rainfall patterns, and thus agriculture, say critics who also worry about what is sometimes called "termination shock"—a sudden warming if the system were to fail.

There is also the danger of conflicts over side-effects—real or perceived, Allen said.

"Countries that are suffering from drought will blame whoever is doing solar radiation management for their troubles," he said.

Because such technologies could be deployed unilaterally by a single

country, or even a company, they also raise questions about who should set the rules.

"We have to imagine governance arrangements that have never been imagined before," said Ghosh, who says research should continue in the meantime.

More information: 'Plan B': Seven ways to engineer the climate:
phys.org/news/2017-10-ways-climate.html

© 2017 AFP

Citation: As Paris climate goals recede, geoengineering looms larger (2017, October 11)
retrieved 16 August 2024 from <https://phys.org/news/2017-10-paris-climate-goals-recede-geoengineering.html>

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.