

4.8

# What about Geoengineering?

**Niclas Hällström, Jennie C. Stephens  
and Isak Stoddard**

‘Geoengineering’ is the intentional technological manipulation of the Earth’s atmosphere and ecosystems at scales so large that it would interfere with and alter global climate systems. Most geoengineering technologies are still only speculative ideas, yet they are extremely controversial.

Geoengineering is not intended to reduce production of fossil fuels or emissions of greenhouse gases, the root causes of global warming. Its proponents seek instead to reduce the warming effects of the sun, either by reflecting some of its radiation back into space or by removing carbon dioxide from the atmosphere and somehow storing it. Solar geoengineering includes widely contested proposals to fly fleets of aeroplanes around the globe to continuously spray large quantities of sun-blocking aerosols into the stratosphere, or to cover extensive areas of Arctic ice with glass beads. Carbon dioxide removal at geoengineering scale includes suggestions to fertilize swathes of the ocean to cause massive algal blooms, or to convert enormous land areas to tree plantations with the intention of burning the wood and capturing the CO<sub>2</sub>.

All geoengineering approaches involve huge risks, some to the point of threatening both ecosystem and societal breakdown. Many impacts would be irreversible and impossible to predict and would exacerbate existing injustices. This is particularly the case with solar geoengineering, where the injection of aerosols into the stratosphere could disrupt monsoons, intensify droughts and threaten the livelihoods of billions of people. Worse yet, if this process were initiated, and then at some future time the sun-dimming aerosol injections were to stop, the masked heating effect of the CO<sub>2</sub> accumulated in the atmosphere could cause sudden and massive temperature rises, preventing any chance of adaptation and driving a catastrophic ‘termination shock’.

Many scholars, experts and activists have concluded that such technologies cannot be managed equitably and safely. Advancing solar

geoengineering assumes the existence of stable global systems of governance that could function without failure for hundreds or thousands of years – an impossible requirement. Allowing the development of these technologies also leads to the frightening prospect of powerful states, organizations or even wealthy individuals exerting unilateral control of them, deepening today's inequities in power and financial access, and escalating the risk of wars over attempts to control the Earth's climate systems. Around the world, there are growing calls for an immediate international ban on the advancement of solar geoengineering technology (see [www.solargeoeng.org](http://www.solargeoeng.org)), and many are working to strengthen the existing geoengineering moratorium under the UN Convention on Biological Diversity.

Attempts to advance real-world research and experimentation on solar geoengineering are consistently met with fierce resistance from Indigenous peoples, scientists and civil society organizations, who warn that humanity must not head down the slippery slope of normalization (see [www.stopsolargeo.org](http://www.stopsolargeo.org) and [www.geoengineeringmonitor.org](http://www.geoengineeringmonitor.org)). Attempts at repackaging the contested term 'geoengineering' into new, less tarnished terms, such as 'climate intervention', 'climate repair' and 'climate protection technologies', shows the ways in which certain actors are attempting to obfuscate the discourse around these controversial technologies.

All geoengineering schemes are attempts to manipulate the Earth with the same domineering mindset that got us into the climate crisis in the first place. The implications of vested interests mainstreaming the idea of geoengineering by discussing it as if it were a viable option may be as dangerous as the impacts of actually deploying geoengineering. Suggesting that geoengineering is a 'plan B' provides convenient excuses for the fossil fuel industry, tech billionaires and other promoters of these ideas to delay and derail the fundamental societal transformations that are urgently needed. Geoengineering is not an option. Intensified climate disruptions and injustices call for something very different: a focus on sufficiency and well-being, curbing emissions at the source and rapidly phasing out fossil fuel production, while prioritizing principles of equity, local livelihood and ecological integrity. /

## What We've Done About It

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*All online sources accessed on 30 November 2021*

**“the injection of aerosols into the stratosphere could disrupt monsoons”** Jones, A. C., et al., ‘Impacts of hemispheric solar geoengineering on tropical cyclone frequency’, *Nature Communications*, 8, 2017: 1382, <https://doi.org/10.1038/s41467-017-01606-0>.

**“if ... the sun-dimming aerosols were to stop”** Pierrehumbert, R., and Mann, M., ‘Some say we can “solar-engineer” ourselves out of the climate crisis. Don’t buy it’, *Guardian*. 22 April 2021, <https://www.theguardian.com/commentisfree/2021/apr/22/climate-crisis-emergency-earth-day>.

**“such technologies cannot be managed equitably and safely”** See ‘We call for an international non-use agreement on solar geoengineering’, Solar Geoengineering Non-use Agreement, <https://www.solargeoeng.org/>.

**“global systems of governance that could function without failure”** Stephens, J. C., et al., ‘The dangers of mainstreaming solar geoengineering: a critique of the National Academies report’, *Environmental Politics*, 18 October 2021, <https://doi.org/10.1080/09644016.2021.1989214>.

**“deepening today’s inequities ... and escalating the risk of wars”** Stephens, J. C., et al., ‘The risks of solar geoengineering research’, *Science*, 372 (6547), 2021: 1161, <https://doi.org/10.1126/science.abj3679>.

**“the UN Convention on Biological Diversity”** ‘Climate-related geoengineering and biodiversity’, United Nations Convention on Biological Diversity, 23 March 2017, <https://www.cbd.int/climate/geoengineering/>.

**“vested interests mainstreaming the idea of geoengineering”** Stephens, J. C., and Surprise, K., ‘The hidden injustices of advancing solar geoengineering research’, *Global Sustainability*, 3, 2020: Article e2, <https://doi.org/10.1017/sus.2019.28>.

**“Suggesting that geoengineering is a ‘plan B’”** See for example Pierrehumbert, R., ‘There is no plan B for dealing with the climate crisis’, *Bulletin of the Atomic Scientists*, 75 (5), 2019: 215–21, <https://doi.org/10.1080/00963402.2019.1654255>.