Opinion – Geoengineering Is Not Going to Deliver Itself

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JOHN HICKMAN, FEB 24 2024

Until recently serious discussion of solar radiation management (SRM) geoengineering among climate policy experts and decision-makers was effectively a taboo. Geoengineering encompasses multiple technological proposals to arrest climate change. Solar radiation management (SRM) geoengineering is the subset of those technologies that would lower global temperature by reflecting more sunlight back into space. Although that might sound innocuous, it has elicited powerful denunciations.

One commentator expressed the consensus by denouncing the idea as "barking mad" taboo violators would be assailed for risking the "green moral hazard," or encouraging the public to think there might be an easy technological fix to the climate problem. Massive reductions in greenhouse gas emissions was believed to be the only workable response. To consider any other response might undermine difficult efforts to persuade the public and decision-makers to undertake the transition to a green economy. This commits the *argumentum ad consequentiam* or 'appeal to consequences' fallacy. Yet the climate crisis was deemed too important to worry excessively about such illogic. SRM geoengineering was a dangerous idea that might be embraced as an easy technological fix and thus needed to be excluded from responsible policy discussion. Moreover, reducing emissions would be accompanied by transformation in how humans related to their environment, which would be the silver lining in the climate cloud.

However, findings from a recent study of political communication by Christine Merk and Gernot Wagner has shown that telling the public about geoengineering has no effect on their thinking about the necessity of reducing emissions. The new study means that climate experts can stop worrying about discussing geoengineering because it may be grasped in plainer language.

The reason we have all begun talking about SRM geoengineering is that the key 'solution' to climate change long championed by the climate policy experts – the United Nations Framework Convention on Climate Change (UNFCCC) – has failed. The 2015 Paris Agreement and subsequent Conferences of the Parties (COPs) have resulted in no meaningful reduction in the accumulation of greenhouse gases in the atmosphere. "In our fractured and divided world," United Nations Secretary General António Guterres said at a press conference at COP28 on December 11, 2023, "COP28 can show that multilateralism remains our best hope to tackle global challenges." Unfortunately, he was wrong. Multilateralism in the sense of reaching consensus-based decision-making is why the UNFCCC has failed.

With absent coercive regulation, no amount of negotiation will overcome the rationality of freeriding in the global tragedy of the climate commons. In this, collectively owned resources that are otherwise sustainable may be destroyed or degraded by overexploitation. Freeriding is self-interested behavior that ignores the collective interest in the sustainability of a commons. The climate is a global commons. Freeriding by emitting greenhouse gases without restraint is individually rational for countries because it avoids the cost associated with transition to green technology. The problem is that freeriding in the global tragedy of the climate commons is almost universal, and no amount of urgent exhortation will alter that rationally self-interested behavior.

Greenhouse gas emissions cause climate change, the most important indicator of which is increasing global temperature. In 2023, the mean global temperature exceeded the 1.5° c benchmark identified in the Paris Agreement. The projected scale and severity of the climate crisis will likely overwhelm the adaptive capacity of many

countries in the Global South. That is why many climate experts have begun to very cautiously discuss SRM geoengineering. For example, the University of Chicago's David Keith qualifies the admission that these technologies may be necessary because emissions reductions will be insufficient with the warning that confidence in embracing or rejecting them is not warranted. Colorado State University's James Hurrell wants to research them as part of a 'portfolio of options". These experts know that SRM Geoengineering promises a way to limit that rise in temperature, and thus the worst of the associated harms.

When SRM geoengineering is imagined, it is as a last-ditch effort undertaken by a broadly representative international organization. That is an unlikely description of what might be realized in practice. Expensive global public goods are usually delivered by one great power, which then benefits disproportionately in return for absorbing the associated costs. The primary global reserve currency and global positioning satellites provided. Granted, the work of international organizations like the International Telecommunications Union and International Labor Organization are also global public goods, but they are typically not costly to deliver.

Although the now broken taboo against discussing SRM geoengineering may have delayed research, we do know that the SRM geoengineering technology most likely to be adopted is atmospheric aerosol injection. This would involve two options. In the first case, deploying a fleet of aircraft to release sulphur dioxide or calcium carbonate into the stratosphere. Alternatively, secondly, deploying a fleet of ships to continuously release sea salt aerosols into the marine boundary layer, which is the part of the atmosphere that has direct contact and is thus directly influenced by the ocean. Particles injected into the stratosphere would reflect sunlight back into space as they fall through the atmosphere over multiple years while particles injected into the marine boundary layer would reflect sunlight by brightening the clouds.

Atmospheric aerosol injection would not involve novel engineering problems or prohibitive cost relative to the cost of doing nothing. However, it would arguably violate Article 192 of the United Nations Convention on the Law of the Sea (UNCLOS), which prohibits harming the ocean environment. The claimed harm would be interference with the ability of the oceans to sequester carbon. International law might be interpreted liberally in the face of the myriad harms projected to be caused by climate change or might simply be ignored. Space based SRM geoengineering, the less often mentioned proposal to construct a global sunshade, would involve developing novel technology and would be more expensive, but would not run afoul of UNCLOS.

How might the decision to adopt SRM geoengineering be reached? Changing the course of the lumbering UNFCCC apparatus is highly unlikely. A summit of the leaders of the United States, China and Russia such as the 1945 Yalta Conference of the Big Three is also highly unlikely. More plausibly, either the United States or China might convene an international meeting with its allies to establish the necessary legal and administrative institutions in a manner comparable to the 1944 Bretton Woods Conference. Which would be the better model? The COPs of the UNFCCC are mobile monuments to the impossibility of effective global governance based on international consensus. Yalta resulted in the United Nations, which promised international security as a global public good that it delivered, albeit unevenly. Bretton Woods promised a functioning international monetary system, and successfully delivered it.

Furious objections to any mechanism adopted to deliver SRM geoengineering may be anticipated from those governments which are themselves unable to deliver SRM geoengineering as a global good or to resist the temptation to freeride on any reductions in greenhouse gas emissions by others. Given that SRM geoengineering is probably inevitable, it is time to discuss how to deliver it.

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