c.f.g | climate interventions

Climate interventions: research vs. deployment

Research into climate interventions and decisions on the actual deployment of these technologies are often treated as the same. This lack of distinction creates confusion and hinders informed, concrete policy discussions based on real risks and benefits.

One reason for the confusion seems to stem from the belief that research into climate interventions will inevitably lead to deployment. Such concerns must be addressed through careful governance, as we at CFG advocate. However, concerns about a potential future deployment should not undermine responsible research. Without research and assessments, future generations of policy-makers face greater uncertainties if or when decisions on deploying or deterring climate intervention-related technologies - such as Solar Radiation Modification (SRM) - arise.

A balanced approach to climate intervention research needs to affirm that deployment is not on the table and distinguish different modes of research, including:

- Curiosity-driven climate research, which has never been questioned but can be affected by restrictive demands regarding climate intervention research
- Focused research on uncertainties and risks of SRM, which has not been done systematically but increasingly seems necessary
- International assessments are needed to summarise the scientific evidence
- SRM technology development, which is more controversial and requires a discussion of its own and oversight

The table below gives an overview of the key positions of the scientific community and groups of individual scholars on the topic with a specific focus on SRM.

Key positions to date

Curiosity-driven research within climate sciences

✓ The scientific and the international community unequivocally supports curiosity-driven climate science	✗ Non-use campaign*

Focused research on SRM uncertainties and risks

✓ The majority of the scientific community has not asked to restrict freedom of research ✓ Letter by the natural science community urging addressing research gaps responsibly** ✓ US[1, 2, 3] ✓ EU[4, 5, 6] ✓ American Geophysical Union*** ✓ CFG: research priorities informed by an EU climate security strategy)	✗ Non-use campaign*

International assessments of SRM

✓ EU[5, 6, 7], US[1], UN (UNEP[8], WMO[9]) ✓ Letter by the natural science community urging addressing research gaps responsibly** ✓ Call for balance****	✗ Non-use campaign*

[1] The White House (2023) Congressionally Mandated Research Plan and an Initial Research Governance Framework Related to Solar Radiation Modification supports a U.S. government-wide research program to study risks and benefits SRM as a supplementary strategy to address climate change.

[2] National Research Council (2015) Climate Intervention: Reflecting Sunlight to Cool Earth recommended an albedo modification research program to be carried out focusing on multiple-benefit research that also furthers basic understanding of the climate system and its human dimensions.

[3] National Academies of Sciences, Engineering, and Medicine (2021) Reflecting Sunlight: Recommendations for Solar Geoengineering Research and Research Governance recommends that the U.S. establish a transdisciplinary solar geoengineering research program with other countries.

[4] The Communication (2023) on the climate and security nexus declares the EU's support for international assessments on risks and uncertainties and for discussions on international governance.

[5] In its Scoping paper: Solar Radiation Modification the EU Commission asks its Chief Scientific Advisors to address the risks and opportunities, and consider governance options, for researching SRM and for its potential deployment.

[6] The Group of Chief Scientific Advisors and the European Group on Ethics in Science and New Technologies published their opinions on the scientific and ethical perspectives of SRM (2024) calling for responsible research on impacts of solar radiation technologies.

[7] The Communication (2023) on the climate and security nexus declares the EU's support for international assessments on risks and uncertainties and for discussions on international governance.

[8] UNEP (2023) One Atmosphere: An independent expert review on Solar Radiation Modification research and deployment recommends establishing a global, transparent, inclusive and fair scientific assessment process for SRM, exploring multilateral SRM governance to address research and deployment concerns.

[9] WCRP (2021) Research to Inform Decisions about Climate Intervention launched a Lighthouse Activity (LHA) on Climate Intervention Research that explores potential future scenarios, provides an overview of Earth system risks and opportunities, and addresses key uncertainties.

Development of climate interventions-related technology	
Few have specifically discussed development; some point to >10-year lead time A company is currently developing climate intervention-related technology – showing the need for democratic oversight	Non-use campaign*

Deployment of large-scale climate interventions	
Consensus: no large-scale test or deployment at the moment Lack of governance is evidenced by startup claiming SRM deployment[10]	Non-use campaign*

[10] Solar Radiation Modification (SRM) is a deliberate, large-scale intervention in the Earth's climate system aimed at reducing global warming. While it does not address the root causes of climate change, it may temporarily mitigate the severe effects of a warming planet. For more information, see CFG's "Policymakers' FAQ: Climate Interventions".

Overview of the most prominent views in the scientific community

* Non-use campaign (no public research & no assessment)

While ostensibly focused on preventing deployment, the campaign written and advocated for primarily by Dutch political science academics and signed by about 500 academics – is restrictive of research and assessments. Their demands prevent publicly funded research – pushing it toward intransparent funding.[12] Furthermore, the campaign de facto asks to prevent balanced international assessments by the IPCC.[13]

** Members of the natural science community

A public letter also from March 2023 by over 110 academics in the natural sciences argued for urgently addressing scientific research gaps, including, where necessary, via field experiments. It affirms the importance of proceeding with responsible research to evaluate the potential to reduce climate risks and impacts, understand and minimise intervention risks, and produce information required for governance.

The scientific community at large

The majority of the academic community has not made any statements on the scientific merit of conducting research specific to SRM. However, there is overwhelming support for climate-related research and increasingly for SRM research if it is interdisciplinary and spans natural science, social sciences, and humanities.[11]

*** American Geophysical Union

The AGU's position statement emphasises that "research aimed at understanding the benefits and impacts of CI [climate interventions] measures is necessary and must consider global transparency, ethical, and inclusion practices and be subject to robust governance and oversight structures. ***CI research must be part of a broader climate solutions package that, given the urgency of addressing climate change, should be funded at a level matching the enormous scale of the space programs of an earlier era."***

**** A call for balance

The Call for Balance signed by about 170 academics in climate- and geosciences and governance, from March 2023, highlights SRM research and international assessments as crucial for SRM governance and for making well-informed decisions in the future. Assessments should be done by reputable international organisations such as the IPCC.

[11] The latest state of the climate 2024 observes: "Research into solar geoengineering needs to focus on understanding the potential environmental, social, and geopolitical impacts," and points to a comprehensive research roadmap (NAS 2021).

[12] Their demands are widely regarded as sweepingly delegitimizing SRM research.

[13] By asking "to object to future institutionalization" they predetermine the outcomes of assessments.