Policy Brief

Key messages for the ethical governance of Solar Radiation Modification (SRM) research

TECHETHOS
FUTURE ○ TECHNOLOGY ○ ETHICS

Highlights 👁

To ensure responsible, just and sustainable SRM research, the Horizon 2020-funded TechEthos project encourages EU policymakers to:

- **Adopt a leadership position in the international arena** in pursuit of internationally recognised definitions of SRM Research, SRM field testing and SRM deployment that align with EU values;

- **Clarify**, for the sake of research policy direction and research organisations, **the implications of existing EU and international principles for governance of SRM research**, in particular the Do No Significant Harm (DNSH) principle, the Leave No-one Behind (LNOB) principle, the Polluter Pays Principle (PPP), and the precautionary approach;

- **Ensure any decision to institute SRM research programmes is managed by permanent, politically legitimate representative bodies**. These should be transparent, accountable, and respectful of human rights. Research programmes should begin by funding research on governance itself, prior to any fundamental research;

- **Encourage international cooperation on SRM governance development**, as well as any fundamental research. SRM Research projects, including modelling and social science, should involve international and interdisciplinary cooperation;

- **Facilitate communication and knowledge-sharing for any SRM research activities** at an international level. Require any EU-funded SRM research projects, including social science and modelling, to transparently report results on an ongoing basis, including the reporting of negative results, ensure accurate presentation of positive results, and promote such requirements in international fora.

Who is this for?

This brief is primarily aimed at **policymakers** at the EU level, and seeks to inform those involved in the international coordination of science policy, the coordination of climate policy and the coordination of research ethics. In addition to these core targets, the brief will also be of interest to intergovernmental organisations, including **agencies of the UN system**, **national governments**, **research funders** and **research policymakers** at both the national and international levels, and research organisations themselves.

Background

Solar Radiation Modification (SRM) is a term which designates a range of proposed interventions intended to slow the heating of the earth's atmosphere by reflecting a portion of incoming shortwave solar radiation. Deployment of these techniques is anticipated to involve physical risks, as well as political risks and governance challenges associated with a potentially very long-term policy commitment to ongoing deployment, depending on emissions reductions. There are also theoretical arguments which support the view that all SRM research involves risk, irrespective of the physical impacts of experiments, because it may create path dependencies in climate policy.

Governance structures must establish an approach to assessing the risks of research which allows for consideration of the risks of failing to pursue research, given the growing threat of the climate crisis, in a way that is consistent with precautionary EU values. This is especially salient given that, even after a return to pre-industrial emissions levels, global temperatures would remain at their elevated level, whereas SRM might offer the possibility of achieving cooling on a shorter timescale, although with distribution of potentially undesirable effects beyond regions of deployment.

Key Messages

Clarify the definition of SRM and SRM research

- **Pursue a common definition of what constitutes SRM research**, and how it is to be differentiated from other forms of environmental research;

- **Pursue a common definition of what constitutes SRM field testing**, what constitutes **SRM deployment**, **and** what would constitute **"deployment with a scientific basis"** within the meaning of the UNCBD decision on geoengineering. This should include defining whether local and regional activities amount to SRM field tests and/or deployment, and whether proof-of-concept experiments constitute field tests.

Formulate an EU Research Policy Direction

- **Ensure the decision to institute SRM research programmes is managed by politically legitimate, permanent representative bodies**. Ensure transparency by publishing the basis for decisions under consideration in accessible form. Ensure accountability, by providing mechanisms for civil society to challenge the goals, standards and methods of the institution tasked with formulating SRM research policy;

- **Ensure decisions to institute SRM research programmes are assessed as part of a full range of potential climate change responses**, without neglecting portfolios of responses that do not rely on SRM research/deployment;

- **Ensure representative bodies' decision-making competence on SRM research programmes is consistent with their representative authority**, reinforcing the need for international cooperation;

- **Revisit UNCBD decisions to clarify the guidance provided regarding SRM-related activities**; meanwhile, agencies at all levels should regard the decision as hortatory recommendation for an effective moratorium on any SRM field-tests that may have significant adverse effects on biodiversity, and should respect that call;

- Consider the possibility of **expanding existing international environmental agreements** to the governance of certain aspects of SRM, such as ENMOD or the Montreal Protocol.

Refine the Governance Framework for SRM Research

- Adopt a precautionary approach guided by ethical guardrails when **assessing the risks of SRM research policy programmes in the context of the risks associated with not pursuing research**. Refrain from comparing risks of research with risks of pausing research i) given scenarios where EU institutions' or member states' fulfilment of duties to protect human rights and the environment is inadequate (according to a politically-defined standard), ii) scenarios in which prospective interventions violate human rights or materially affect people without democratic influence, or iii) scenarios in which the interests of the most vulnerable are traded off against the interests of the rest;

- Promote as best practice the norm that **SRM governance research projects**, social science on SRM, as well as any fundamental research including modelling, **should be based on international partnerships** with as wide representation as possible;

- **Facilitate communication and knowledge-sharing of any SRM research activities** at an international level. Require any SRM research projects, including social science and modelling, to transparently report results on an ongoing basis, including the reporting of negative results, and ensuring balanced presentation of positive results;

- **Manage the allocation of research funding to limit the potential for acquisition of intellectual property into SRM technologies** by private entities unless such acquisition is demonstrably in the public interest;

- **Require any SRM research projects that go beyond computer modelling and observational studies**, including those that envisage technology development in a laboratory setting, to include a public consultation component, which should contain a capacity-building element. Capacity building should run in parallel with consultation.

Safeguard Procedural Justice and Human Rights

- **Include normative values such as legitimacy and global justice** when assessing the implications of SRM and SRM research, as well as rejecting SRM, for the protection of human rights;

- **Develop means for effective public participation at a global level** under existing international law such as the Aarhus Convention;

- **Evaluate the potential of alternative mechanisms to facilitate** effective means of **public participation**, such as by reflecting on the role of the International Seabed Authority in governing activities in the International Seabed Area within the meaning of UNCLOS;

- **Promote transparency** about any emerging national SRM research activities, ensure public accountability, and strengthen compliance with the Aarhus Convention by re-evaluating means of facilitating effective public participation in the context of SRM research.

Further reading

- Adomaitis, L., Grinbaum A., Lenzi, D. (June 2022) TechEthos D2.2: Identification and specification of potential ethical issues and impacts and analysis of ethical issues of digital extended reality, neurotechnologies, and climate engineering. TechEthos Project Deliverable. Available at: techethos.eu;

- Cannizzaro, S., Bhalla, N., Brooks, L. and Richardson, K. (2023), TechEthos Deliverable D5.3: Operational guidelines/ codes for selected technologies. TechEthos Project Deliverable. Available at: techethos. eu;

- Vinders, Julie (2023). TechEthos D5.2 Enhancing Legal Frameworks at the National and International Level, For the governance of climate engineering, neurotechnologies and digital extended reality. TechEthos Project Deliverable. Available at: techethos. eu;

- Vinders, J., Howkins, B. (2023). Policy briefs on enhancing EU legal frameworks. Deliverable 6.2 for the European Commission. TechEthos Project Deliverable. Available at: techethos.eu.

This policy brief is based on the results of the social, ethical, and legal analyses of the TechEthos project. Policy briefs on other project results are provided at www.techethos.eu.eu.

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