



Policy Brief

Enhancing EU legal frameworks for Solar Radiation Modification

TECHETHOS

FUTURE ◦ TECHNOLOGY ◦ ETHICS

February 2023

Highlights



This policy brief provides recommendations to the European Union (EU) in relation to Solar Radiation Modification (SRM), which together with Carbon Dioxide Removal (CDR) are collectively known as 'climate engineering' or 'geoengineering'. To protect and uphold ethical, fundamental rights and sustainability considerations in the research and development of SRM, the Horizon 2020-funded [TechEthos](#) project encourages EU policymakers to:

- **Clarify the definition** and various **types of research activities** that constitute SRM research;
- **Determine the conditions** under which – if any – research into various types of SRM may be conducted;
- **Clarify the role – if any – of various types of SRM** in alleviating the impacts of climate change;
- Evaluate the effects of SRM research activities on **EU fundamental rights and principles**;
- **Collaborate internationally** and evaluate existing international governance regimes.

Who is this for?

This brief is primarily aimed at EU institutions including the European Commission, European Parliament, the Council of the European Union, and the European Council. This brief seeks to inform EU policymakers and officials involved in the preparation of legislative or policy initiatives related to **climate action, climate technologies, climate engineering, geoengineering, and SRM**.

Introduction

SRM refers to a type of climate engineering technique that aims to reflect sunlight and heat back into space to reduce warming. Whilst the objective of SRM would be to alleviate some impacts of climate change, such techniques present various risks and are considered controversial. This policy brief sets out recommendations based on the challenges related to SRM identified through an analysis of EU laws and policies as part of the TechEthos project. In particular, these recommendations are considered in the context of EU law and policy, including the European Climate Law and the Green Deal, as well as international environmental agreements to which the EU and/or its Member States are parties to, such as the United Nations Convention on Biological Diversity (UNCBD), the Aarhus Convention, and the UN Convention on the Prohibition of Military or Any Other Hostile Use of Environmental Modification Techniques (ENMOD).





Clarify the definition and various types of research activities that constitute SRM research

- The EU should clarify the **definition** for and the various **types of research activities that constitute SRM research**, taking into consideration the distinction between outdoor experimentation and lab-based research, as well as research from deployment. In doing so, the EU should seek to harmonise with the terminology of the Intergovernmental Panel on Climate Change (IPCC).
- The EU should focus not only on large-scale SRM activities with the **purpose of moderating the global climate system**, but also consider the **cumulative effect of small-scale SRM activities** conducted for purposes other than the moderation of the global climate system.
- Furthermore, the EU should evaluate the adequacy of **existing environmental liability regimes** that would apply to different types of SRM research activities, and in relation to the potentially cumulative effect of SRM activities at different scales.

Determine the conditions – if any – under which research into various types of SRM may be conducted

- The EU should investigate whether further research into various types of SRM should be conducted, and **determine the conditions, if any**, under which SRM research in general, and especially any open-air testing, could be conducted.
- The EU should consider the conditions for SRM research in light of the precautionary principle and the de facto international **moratorium on SRM** under the UNCBD.
- The EU should evaluate what **normative values and ethical principles** are at the core of the conditions under which SRM research may be conducted, such as fundamental rights, biodiversity, sustainability, international development and public participation.
- Through its investigation, the EU should

consider the normative framing of research into SRM, particularly in relation to **standards of legitimacy**. This may demand stringent public participation inclusive of representation for both global and intergenerational voices, amongst others.

Clarify the potential role – if any – of various types of SRM in alleviating the impacts of climate change

- The EU should clarify whether SRM could and should play a role – if at all – in alleviating the impacts of climate change. This includes considering whether to facilitate further scientific research into the technical, social and political feasibility of SRM, as well as wider social scientific and humanities-based research into the **research ethics and research integrity considerations of SRM**, its potential fundamental rights implications, as well as wider socio-economic, environmental and biodiversity considerations.
- The EU should also explore how decisions on the permissibility of SRM research may take various forms of **risk and risk-mitigation** into account, including SRM's potential for climate-risk-reduction as well as the risks associated with various forms of SRM research or use.

Evaluate the effect of SRM research activities on EU fundamental rights and principles

- The EU should evaluate the implications of SRM **research on rights related to scientific research**, such as the right to enjoy the benefits from scientific progress, moral and material interests resulting from scientific production, and the rights of research participants. This would inform the conditions – if any – under which research into SRM may be conducted.
- In determining the conditions – if any – under which SRM research may be conducted, the EU should take a **holistic approach** to evaluating the effect of SRM on the protection of fundamental rights and the environment, taking into account **normative values** such as legitimacy and global justice.
- Furthermore, the EU should evaluate **effective and inclusive ways of promoting public participation** in the context of SRM, which is likely to extend beyond the borders of the EU.





Collaborate internationally and evaluate existing international governance regimes

- The EU should **collaborate internationally** in defining the conditions – if any – under which SRM research may be conducted. The EU should evaluate the adequacy of **existing international governance regimes**, including but not limited to, international law on space-related matters, the Aarhus Convention, the UNCBD and the de facto moratorium on SRM, and the ENMOD.

Final take-aways



A key takeaway is the need to **clarify the conditions – if any – under which research into SRM may be conducted**. The EU should consider the possible wide-ranging implications of SRM research and consider the normative framing of SRM research, particularly in the context of its legitimacy.

The following actions would be beneficial to the EU's consideration of SRM research:

- Clarify the definition of SRM and the **various types of research activities that constitute SRM research**;
- Evaluate the **normative values and ethical principles of SRM research**, including but not limited to legitimacy and global justice;
- Adopt a **holistic approach** to evaluating the effects of SRM on the protection of fundamental rights and the environment;
- **Evaluate what role – if at all – SRM should play** in alleviating the effects of climate change;
- **Collaborate internationally** and evaluate the adequacy of international governance regimes.

Further reading



- Adomaitis, L., Grinbaum, A., Lenzi, D. (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: www.techethos.eu; and <https://doi.org/10.5281/zenodo.7619852>.
- Bernstein M.J. and Mehnert E.W. (2022) Policy note: Analysis of expert scenarios addressing ethical implications of the selected technologies. TechEthos Project Deliverable to the European Commission. Available at www.techethos.eu; and <https://doi.org/10.5281/zenodo.7615250>.
- Santiago, N., et al. (2022). TechEthos D4.1: Analysis of international and EU law and policy. TechEthos Project Deliverable. Available at: www.techethos.eu; and <https://doi.org/10.5281/zenodo.7650731>
- Vinders, J., et al. (2022). TechEthos D4.2: Comparative analysis of national legal case studies. TechEthos Project Deliverable. Available at: <https://www.techethos.eu/national-legal-cases-on-emerging-technologies/>.

This policy brief is based on the results of the legal analysis of the TechEthos project. Further policy briefs on wider ethical project results will be provided at www.techethos.eu.

Keep in touch



@ www.techethos.eu

✉ info@techethos.eu

🐦 [@TechEthosEU](https://twitter.com/TechEthosEU)

in [TechEthosEU](https://www.linkedin.com/company/techethos/)

