BRIEFING

Towards climate neutrality

European Parliament

Options for the responsible governance of research on solar radiation modification

SUMMARY

Methods to reflect sunlight, known as solar radiation modification (SRM), have received growing attention as a potential complementary approach to address climate change, in addition to reducing greenhouse gas emissions, carbon dioxide (CO_2) removal and adaptation. SRM could lower temperatures by reducing the amount of sunlight that reaches the Earth's surface.

In 2024, the EU's Group of Chief Scientific Advisors issued a scientific opinion on SRM, followed in October 2025 by reports from the United Kingdom's (UK's) Royal Society and the French Academy of Sciences. Also that October, an Israeli-US startup received US$60 million (€51 million) of funding for SRM research and experiments. In May 2025, the UK launched a £56.8 million (€66 million) programme to explore the feasibility, safety and governance of climate cooling approaches.

While various international agreements apply to it, there is no comprehensive framework to regulate SRM. It is also unclear which international organisation should be in charge of developing such a framework. The Convention on Biological Diversity decided on a de-facto moratorium on outdoor SRM activities, while the United Nations (UN) Environment Assembly discussed the governance of SRM without reaching a consensus.

The EU insists on application of the precautionary principle to SRM and supports related risk assessments. The European Parliament calls for an EU-wide moratorium on the use of SRM and advocates a global SRM governance framework based on a firm stance of non-deployment.

This briefing summarises the state of knowledge about various proposed SRM methods and associated risks, explains their potential role in global climate action, gives an overview of the existing rules for SRM research and development, and outlines options for the future governance of SRM research.

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Author: Gregor Erbach

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Introduction

The idea of using sunlight reflection technologies to counteract the effects of global warming, popularised in 2006 by Nobel laureate Paul Crutzen, has gained renewed attention. Three major scientific reports were published in the last two years, by EU chief science advisors in December 2024 and by the UK Royal Society and the French Academy of Sciences in October 2025. The UK's Advanced Research and Invention Agency (ARIA) announced £56.8 million (€66 million) of funding for 21 climate cooling research projects in May 2025. Israeli-US startup Stardust Solutions raised US$60 million (€51 million) in October 2025 for developing sunlight reflection technologies.

SRM has previously been referred to as 'solar radiation management', but 'modification' is preferred because it is still unclear to what extent it is actually manageable. It belongs to the wider field of geoengineering (also known as climate engineering or climate intervention) that also encompasses CO_2 removal.

State of the climate and international climate action in 2026

Global temperatures continue to rise. The last three years were the warmest on record, and the rate of global warming has accelerated to around 0.35 °C per decade. This is largely caused by greenhouse gas (GHG) emissions. Despite more than 30 years of international climate action, human-made GHG emissions are still rising. In addition to human-made emissions, climate change itself causes emissions from natural systems, e.g. from forest fires or melting permafrost. Moreover, Earth's capacity to reflect solar radiation back into the atmosphere, known as albedo, has decreased due to reduced air pollution and the loss of snow, ice and cloud cover.

It is now virtually certain that global temperature rise will exceed 1.5 °C, surpassing the lower temperature target of the Paris Agreement. Ambitious and swift global climate action, including massive net CO_2 removals after reaching climate neutrality, will be required to reverse the overshoot and bring global temperature rise back to below 1.5 °C. With every year of insufficient climate action, atmospheric GHG concentrations rise, making this task more difficult than ever.

The Intergovernmental Panel on Climate Change (IPCC) issued a special report outlining the high risks associated with exceeding the 1.5 °C target. These risks include the crossing of irreversible tipping points in the Earth systems, such as the melting of polar ice sheets, loss of the Amazon rainforest and collapse of the Atlantic meridional overturning circulation. There is also an increased risk of self-reinforcing feedbacks that lead to further warming. These feedbacks and tipping points introduce considerable uncertainty into projections about the future state of the climate, making it difficult to plan for adaptation and resilience.

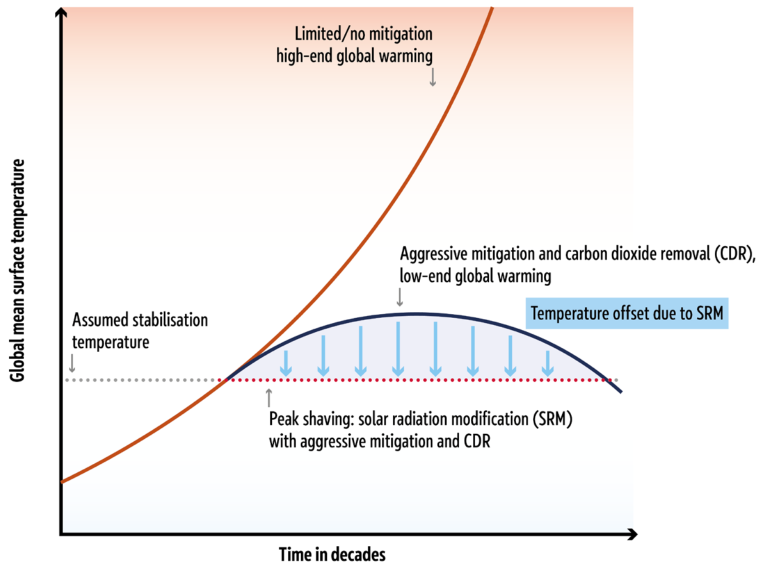
Analysis of national climate plans submitted ahead of the UN Climate Change Conference (COP30) in November 2025 shows that the world is on track to global warming of 2.4 °C, if the plans are fully implemented. COP30 failed to deliver a breakthrough that would reverse this trajectory, and current geopolitical trends indicate an increasingly difficult climate for global cooperation.

The current trends point to a future where it may become impossible to adapt to some climate impacts and to recover from catastrophic climate-induced losses and damages. Risk management experts warn of cascading risks leading to health impacts, excess mortality, mass displacement, severe economic contraction, financial breakdown and conflict.

There are two main scenarios in the context of solar radiation modification.

Temporary application: Even in a situation where greenhouse gas emissions are reduced and CO_2 removals increase to reach climate neutrality first and net GHG removals thereafter, temperature rise will temporarily exceed the 1.5-degree limit before falling again. In this scenario – known as peak shaving – SRM may limit the temperature overshoot (Figure 1), thus potentially avoiding catastrophic events and irreversible tipping points.

Figure 1 – Peak shaving for temperature stabilisation



Source: EPRS graphic by Samy Chahri, inspired by J. G. Shepherd.

Long-term application: In a situation where global climate action falls short, SRM could reduce global temperatures to keep temperature rise within a range where adaptation is still possible and the worst impacts and tipping points are avoided. In this scenario, SRM would need to continue indefinitely. The reduction and phase-out of net GHG emissions would still be needed to prevent further temperature rise.

The use of SRM has also been discussed as a means to protect vulnerable elements of the Earth system such as Polar ice shields, the Amazon rainforest and coral reefs.

SRM approaches

Several methods have been suggested to reduce the amount of sunlight warming up the Earth. This can be achieved either by reducing the amount of sunlight that reaches the surface of the planet (Figure 2), or by letting more heat escape into space.

Table 1 – SRM approaches

Approach	Characteristics	Effectiveness and technical difficulty
Stratospheric aerosol injection (SAI)	Release of particles in the stratosphere to reflect solar radiation back to space. Global effect. Annual cost estimated at tens of billions of dollars for one degree of cooling.	High effectiveness, medium technical difficulty
Marine cloud brightening (MCB), Marine sky brightening (MSB)	Injection of salt droplets into low-altitude clouds, to increase their reflectivity. Local effect.	Medium effectiveness, medium technical difficulty
Surface albedo modification	Increasing the brightness of elements of the Earth's surface (for example, white roofs) to reflect solar radiation back to space. This includes methods like sea ice thickening to protect or recreate Artic sea ice.	Low effectiveness, medium/low technical difficulty
Cirrus cloud thinning	Hypothetical interventions to reduce the thickness of cirrus clouds, to let more heat (infrared radiation) escape into space.	Low effectiveness, high technical difficulty
Space mirrors	Large artificial reflectors in space, to shade the Earth and reflect solar radiation.	High effectiveness, very high technical difficulty

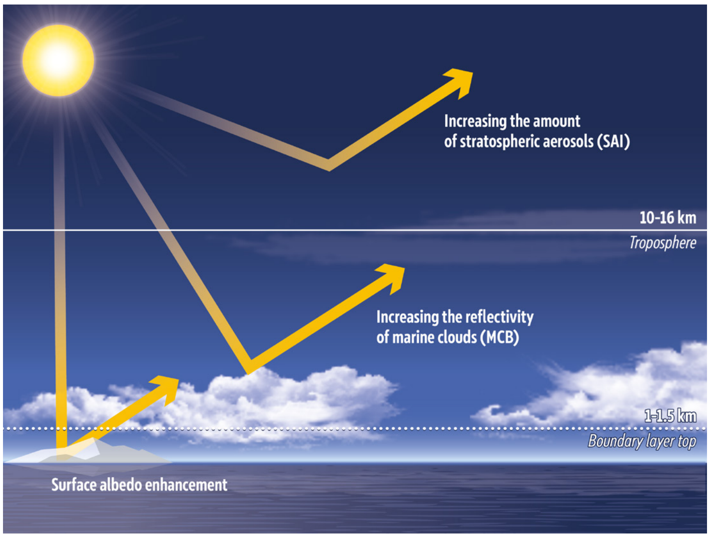
Sources: IPCC, Royal Society, SAPEA, UNEP.

SAI and MCB are the most widely considered options because they combine high potential effectiveness with moderate technical difficulty.

Stratospheric aerosol injection (SAI)

Stratospheric aerosol injection involves the release of sunlight-reflecting aerosol particles in the stratosphere, located some 10-50 kilometres above the Earth's surface. This would require special planes that can fly at such high altitudes, and would take around a decade to develop. Model simulations most commonly assume that sulfate aerosols would be used, but other materials have also been studied. SAI would also require the development of methods for producing aerosols of a specific size and uniformity. Modelling indicates that SAI could achieve up to 1 °C of cooling, which would require annual injections of sulfur dioxide roughly equivalent to the Mount Pinatubo eruption in 1991.

Figure 2 – Main SRM approaches



Source: EPRS graphic by Samy Chahri.

Aerosols will last in the stratosphere for one to three years. They will have to be replaced regularly, otherwise the cooling effort will be undone, resulting in a rapid temperature rise over one to two decades, also referred to as a 'termination effect' or 'termination shock'. Once started, it would therefore be problematic to stop SAI, even if negative side-effects are discovered. Even with ambitious mitigation efforts, SAI would have to be applied for around a century until enough CO_2 has been removed from the atmosphere to stabilise the temperature rise at 1.5 °C. The aerosols would mix in the stratosphere, excluding a purely local application of SAI. Moreover, the effectiveness and regional impacts of SAI would depend on the timing and location of the aerosol injections. Inconsistent or intermittent application would increase climate variability, with likely negative impacts on food production.

Marine cloud brightening (MCB)

MCB is the injection of aerosol particles into low-altitude clouds in specific ocean regions, leading to an increased reflection of sunlight. MCB model simulations usually assume that the aerosols are sea-salt particles generated by spraying seawater from near the ocean surface. This would need to be done regularly because the lifetime of sea salt aerosols in the atmosphere is only around 10 days. Like SAI, MCB would require the development of delivery platforms/vehicles and of methods for producing aerosols of a specific size and uniformity. MCB can only be applied effectively in specific locations, rather than globally.

Real-world analogues

Real-world analogues are historic events that had effects similar to proposed SRM methods. The primary analogue for SAI are large explosive volcanic eruptions that cause a few years of global cooling. In 1991, Mount Pinatubo in the Philippines erupted 17 million tonnes of sulfur dioxide into the atmosphere. The resulting sulfuric acid particles reflected sunlight and cooled average global temperatures by up to 0.5 °C for about a year and a half.

For MCB, the main analogue is the brightening effect of sulfur dioxide emissions from shipping and of effusive volcanic eruptions on low-altitude clouds. Until recently, cloud brightening from ship emissions offset around 3-5 % of global warming from GHGs, but this effect is getting smaller as cleaner shipping fuels are used in order to improve air quality. This effect is referred to as 'unmasking' and has been likened to the 'termination shock' that would result if SRM is stopped.

Impacts and risks

There are large uncertainties and knowledge gaps regarding the potential of SRM to reduce climate change risks. According to the Royal Society, the influence of SAI on the climate is currently much better understood than MCB, although the climate effects of both methods are less well understood than the influence of GHGs on climate change. It may not be possible to fully assess the impacts and risks of large-scale SRM deployment before such deployment takes place. Monitoring would be necessary to assess the effects of SRM use, but it will be hard to distinguish SRM effects from natural variability. Moreover, in case of SRM deployment, it will be impossible to know what the situation would have been without SRM.

SAI has the potential to lower global temperatures by up to around 1 °C within a few years and to alleviate some climate hazards, but it would not restore the climate to its previous state. Likely positive impacts of SRM include an increase in net primary productivity (conversion of energy to organic substances by photosynthesis), an enhancement of global land and ocean CO_2 sinks and a reduction of wildfires. The impact on crop yields and ice sheets is not well understood. Sea level rise and glacier melting would likely be reduced.

While researchers are confident that SAI can achieve global cooling, there is less certainty about other effects. Modelling indicates uneven and uncertain regional and seasonal effects. Precipitation would likely be lower, with regional differences. SAI could have substantial risks, unintended and unexpected consequences, as well as side-effects because of complex chemical, radiative, and dynamical interactions. Possible examples of this include changes to the water cycle and clouds, and effects on ecosystems, agriculture and health. A resulting change of the sky's brightness may have impacts on the productivity of solar panels. Rapid implementation or termination of SRM would very likely result in abrupt changes to the water cycle. There is considerable uncertainty about impacts on the ozone layer. The air quality impacts of SAI are likely small and mainly driven by changes in climate, not the actual aerosols. SAI may contribute to acid rain, but would cause only little damage compared to other sulfur emissions resulting from human activity. Similarly, sea salt proposed for MCB would not have a significant impact on vegetation compared to the natural deposition of sea salt. MCB may cause changes to the El Niño Southern Oscillation.

In any case, SRM would not address the root cause of climate change, namely rising atmospheric CO_2 concentrations. While SRM can help cool the oceans, it would do nothing to reverse ocean acidification, which results from CO_2 that oceans absorb from the atmosphere. Ocean acidification has been identified as one of the planetary boundaries and critical thresholds have already been crossed.

SRM research and development

SRM has been researched primarily via computer climate models, often by climate scientists. Since 2010, the international Geoengineering Model Intercomparison Project has assessed geoengineering scenarios using multiple climate models. Laboratory experiments are carried out to examine different materials for SAI and MCB – for example, cloud chamber experiments at the University of Manchester. Very few outdoor experiments have been performed, with such small quantities of particles that negative impacts can be excluded and the climate is not affected. The Cooling and Shading R&D Subprogram to protect the Great Barrier Reef is one of the few ongoing outdoor experiments. Planned outdoor experiments in Sweden and California were cancelled due to public opposition and broader concerns about climate interventions. Overall, the funding for SRM research is small, estimated at less than 0.1 % of total climate research funding. SRM research has mostly focused on understanding the likely effect of climate interventions, and not on engineering of technologies that would be needed for SRM deployment. In addition, there is a lot of research on governance, ethics, and security dimensions of climate interventions.

An EU-funded project, Co-CREATE, works with a broad range to stakeholders to identify elements for a governance framework for SRM research, and held an International Forum on SRM Research

Governance in May 2026. The project GENIE, funded by the European Research Council, explores multiple dimensions of GHG removal and SRM and works towards a comprehensive scientific assessment for evidence-based policymaking. The European Space Agency carries out fundamental research on SRM, combining satellite data and computer modelling.

The World Climate Research Programme promotes scientific research on climate intervention. The Degrees Initiative supports activities and research projects in developing countries to build capacity to evaluate SRM. It has funded 39 projects in 23 developing countries, with over US$3 million (€2.6 million). Reflective, a non-profit research organisation, develops data and tools to help make informed decisions on SRM. Since 2020, the United States (US) National Oceanic and Atmospheric Administration has carried out modelling and laboratory studies to investigate the efficacy and potential impacts of SRM methods.

The UK's Natural Environment Research Council supports climate modelling to understand the impacts of SRM with £10.5 million (€12.5 million). The UK's Advanced Research and Invention Agency (ARIA) is investing £56.8 million (€66 million) in the Exploring Climate Cooling programme to investigate if climate cooling approaches could ever be feasible, scalable, safe, and governable.

Commercial companies are starting SRM activities. In October 2025, the Israeli-US startup company Stardust Solutions raised a US$60 million (€51 million) investment, bringing their total amount of capital raised to US$75 million (€64 million). The company is working on a complete SAI solution, including proprietary reflective particles, high-altitude deployment systems and real-time atmospheric monitoring. In April 2026, the company published its guiding principles and technical proposals for safety and controllability. Moreover, the US company Make Sunsets sells 'cooling credits' for small scale releases of sulfur dioxide in the stratosphere. So far, the quantities released are too small to have any impact on the climate. The company was granted a US patent in December 2025. Scientists warn that the unregulated development of SAI technologies by for-profit entities may encourage premature deployment without proper safety assessments.

International SRM governance

The 1992 United Nations Framework Convention on Climate Change (UNFCCC) aims for 'stabilisation of **greenhouse gas concentrations** in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'. The 2015 Paris Agreement (under this convention) has the main objective of 'holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 °C above pre-industrial levels' (Article 2), to be achieved by reaching '**"global peaking" of GHG emissions** as soon as possible' and net-zero GHG emissions in the second half of this century (Article 4). SRM is thus outside the scope of the UNFCCC and has only been discussed informally in side events of UNFCCC conferences, but never featured on the formal agenda.

There is no targeted international law or agreement relating specifically to SRM. However, there are some international agreements that cover aspects of SRM research and deployment.

In 2010, the Convention on Biological Diversity (CBD) adopted Decision X/33 on biodiversity and climate change, inviting parties to prevent climate-related geoengineering activities that may affect biodiversity, until there is adequate scientific justification and appropriate consideration of the associated risks, while allowing for small-scale research in controlled settings. The 16th Conference of the Parties to the CBD reaffirmed this de-facto moratorium in November 2024.

Other existing treaties are relevant to SRM, but do not rule out its use. For example, the Convention on Long-Range Transboundary Air Pollution regulates ground-level pollution, including sulfur dioxide, but does not cover the stratosphere. The Montreal Protocol aims to protect the ozone layer and could, in theory, be adapted to cover substances used for SAI. The Environmental Modification Convention prohibits environmental modification of the atmosphere for military or hostile purposes.

The 2024 UN Environment Assembly considered a Swiss-led proposal to establish an expert group on SRM, but could not reach a consensus. In May 2025, the UN scientific advisory board highlighted issues regarding SRM research governance, ahead of a consultative workshop and policy dialogue. A May 2026 working paper from the UN Environment Programme stresses the foundational role of early and inclusive governance of SRM, highlighting the importance of justice, global equity and intergenerational responsibility. It calls for a comprehensive assessment of readiness, feasibility, risks and impacts of SRM approaches.

Governance options for SRM research

Types of governance

Governance of SRM can serve different purposes – for example, preventing premature and therefore risky large-scale deployment, in line with the European Parliament's position. To prevent unilateral SAI deployment, which would have worldwide effects, a non-use agreement would need to be global and agreed in an international framework, such as the UN Environment Assembly. However, governance can also serve to enable deployment and aim to ensure safety, effectiveness and equity. Any future large-scale SRM deployment would also require global governance because of the need to follow an optimal injection strategy over time and consider space, in order to maximise benefits, minimise harm and avoid potentially large, undesirable, regional climate effects.

So, the governance of SRM research and development can be both enabling and restrictive. Enabling governance may set out a coherent research programme with funding and regular assessments. Restrictive governance sets strict conditions under which research activities may be carried out. This can take various forms, from binding rules to principles and best-practice guidelines. In the absence of a global international agreement, various actors can be involved in SRM governance: supra-national entities like the EU, nation-states, local and regional authorities, scientific societies and science academies, research funding agencies, universities and research institutes. The Solar Geoengineering Research Governance Platform, established in 2026, is a voluntary, multi-regional initiative to promote transparency, accessibility and accountability of SRM research.

Governance principles

In 2009, a group of academics proposed the five Oxford Principles for geoengineering: regulation of geoengineering as a public good; public participation in decision-making; disclosure of research and open publication of results; independent assessment of impacts; and governance before deployment. The Tollgate Principles elaborate on this further by focusing on justice and political legitimacy. In 2021, the US National Academies suggested an integrated framework in which SRM research governance and research activities evolve hand in hand, with mechanisms for stakeholder engagement and periodic assessments. Building on these previous works, in October 2024, the American Geophysical Union released ethical framework principles for climate intervention research, based on the issues of responsible research, holistic climate justice, inclusive public participation, transparency and informed governance. According to the Royal Society, there is now broad agreement on the general principles that should govern SRM research and development, but their operationalisation remains an open question. In the absence of formal governance structures, variations of the aforementioned principles have been applied to specific research activities on a case-by-case basis.

The precautionary principle is one of the foundations of EU environment policy. It requires that an action should not be taken unless there is proof that is does not cause significant harm. Applied to SRM, this would mean that outdoor experiments may only be carried out if their safety can be proven. On the other hand, the precautionary principle has also been invoked as a justification for pursuing SRM research, to generate knowledge about climate interventions, since a termination of research would eliminate a potential option for dealing with dangerous levels of global warming.

Governance issues

Governance frameworks for SRM need to evolve as research generates new knowledge on which to base decisions about further steps, especially when moving from modelling and laboratory experiments to outdoor experiments. One proposal calls for responsible outdoor research with small quantities of aerosols, following a multi-stage research protocol similar to that for clinical trials of medicines.

The **moral hazard** argument against SRM research is that the potential future availability of a technology to cool the planet would lead to a reduction of efforts to cut net GHG emissions (mitigation deterrence). Although there is no evidence that potential future SRM options are driving the persistent rise of GHG emissions, mitigation deterrence remains a concern. A large-scale behavioural experiment with almost 2 300 participants found that information about SRM did not change their behaviours or stated climate policy preferences. Moreover, to prevent catastrophic climate change and ocean acidification, ambitious climate mitigation will be needed in addition to any potential application of SRM. However, it remains possible that **misinformation** may lead to overly optimistic expectations of SRM's potential, but also to an over-estimation of its dangers.

Another debate is centred on fears that SRM research would eventually lead to large-scale deployment. Its proponents argue that performing outdoor experiments requires the development of SRM technology (such as special aircraft or reflective particles), which would then likely be deployed on a larger scale by nation-states or commercial companies. Conversely, proponents of SRM research argue that dangerous, unilateral emergency deployment of SRM becomes more likely in the absence of a solid knowledge base.

Public participation and transparency are considered necessary to build trust and acceptance for SRM research, especially outdoor experiments. Cancellations of outdoor SRM experiments have shown the critical role of local actors as gatekeepers. Most SRM research is currently carried out in the Global North, while the populations most affected by current and future climate impacts are in the Global South. The African Climate Intervention Research Hub, established in 2025, connects scientists and institutions to strengthen Africa's capacity and leadership in this field.

SRM raises questions of **intergenerational fairness** and equity. Once SRM deployment is started, it would have to be maintained over one or more centuries. This would burden future generations with the costs and side-effects, and expose them to the risk of a termination shock. On the other hand, the case has been made that research on SRM must be carried out as soon as possible to equip future generations with the knowledge needed to make informed decisions about the potential use of SRM to prevent catastrophic climate impacts.

SRM also poses important international security issues. Although direct weaponisation of SRM is unlikely due to a lack of precision of the technologies, deployment by one or several states has the risk of creating international tensions, for example due to different temperature preferences or attribution of climate impacts to SRM deployment. This risk is compounded by the fact that attributing climate impacts to SRM interventions is difficult because they are hard to distinguish from natural variability. There is interest in **detecting undeclared SRM activities**, as requested by the European Parliament. The US is developing an early warning system to detect climate interventions. Countries affected by real or perceived SRM impacts may resort to counter-geoengineering or even armed conflict. However, foreign policy experts warn that framing SRM as a national security issue may be counter-productive, and hinder effective action on climate change, which is the real security threat.

SRM research is considered a **risk management strategy**, balancing the risks associated with SRM research and potential deployment against the risk of climate impacts in the absence of SRM options. Both types of risk are hard to assess and quantify. Such a risk-risk assessment of climate interventions could complement a proposed global assessment of avoidable climate change risks that would also include worst-case scenarios. While there is agreement that the best risk reduction strategy is a rapid decrease in net GHG emissions, which addresses the root cause of climate change, interest in SRM as a potential additional risk management tool is likely to grow, as long as uncertainty persists around the effectiveness and future prospects of global climate action.

Nation-state and stakeholder views

The UN Human Rights Council Advisory Committee warns that the expected impacts of SRM violate the right to food and water. It recommends a ban on development and implementation of SRM and restrictive regulations on SRM experiments, including a ban on outdoor experiments. Conversely, the Alliance for Just Deliberation on Solar Geoengineering makes the case that a human rights analysis of SRM must weigh the potential risks of SRM research against the consequences of failing to generate knowledge about SRM.

While there are no countries that promote large-scale SRM deployment, some have opposed, restricted or banned certain SRM activities. In July 2025, all 54 African countries reaffirmed support for a non-use agreement during the African ministerial conference on the environment, stressing that SRM poses 'significant and uncertain environmental, ethical, and geopolitical risks'.

The US Environmental Protection Agency monitors potential SRM activities, which must be reported under the Weather Modification Reporting Act. Four federal states have adopted bans on solar geoengineering experiments, and 14 other states are considering them, amid bipartisan opposition to geoengineering. Mexico announced a ban on solar geoengineering experiments in January 2023, after the unauthorised launch of SAI balloons in Baja California by the company Make Sunsets.

Germany excludes SRM as a climate policy option and does not fund any SRM research. The German Environment Agency advocates for a precautionary approach to SRM and expressed serious concerns about normalisation through research. It calls for a complete ban on SRM deployment, including field experiments, and insists that regulation of research activities must be grounded in a legally binding ban. The French Academy of Sciences recommends a ban on SRM deployment and opposes specific research on SRM methods because such research might normalise the concept and discourage effective emission reductions. Although the report by the UK's Royal Society highlights knowledge gaps and presents principles for governance of SRM research, it does not take a position on whether further SRM research should be carried out.

The scientific community is split in its views to SRM. One group of scientists argue for a solar geoengineering non-use agreement that would include a ban on outdoor experiments. Reacting to this, other researchers have published a call for balance and a letter supporting research.

The Climate Overshoot Commission, a non-governmental initiative, is in favour of SRM research and governance dialogue, while calling for a moratorium on large-scale SRM. The Environmental Defense Fund expresses a similar position. The Centre for Future Generations calls for cooperation on criteria and guardrails to prevent irresponsible testing and deployment and empower responsible research, complemented by a collaboration on foresight to anticipate possible developments. They propose a system of satellite-based monitoring for testing activities and a public registry of SRM research, testing and funding to ensure transparency.

EU policy and European Parliament position

The EU first set out its position on SRM in the June 2023 in its Joint Communication of the Commission and High Representative on the Climate-Security Nexus. Guided by the precautionary principle, the EU will support international efforts to assess the risks and uncertainties of climate interventions and promote discussions on a potential international framework for its governance. The communication highlighted a lack of rules, procedures and institutions, and knowledge gaps regarding risks, impacts and unintended consequences.

In August 2023, the European Commission requested the Science Advice Mechanism to produce an evidence review report and a scientific opinion on SRM. Both were delivered in December 2024. The Group of Chief Scientific Advisors recommended an EU-wide moratorium on the use of SRM and negotiations on a global governance system, in which the EU position should be for non-use of SRM.

According to the group, SRM research should be conducted responsibly, in accordance with ethical principles, and include research on the full range of possible effects and impacts, as well as governance and justice issues. It called for periodic reassessment of the scientific evidence every five to 10 years. The European Group on Ethics in Science and New Technologies issued an opinion on SRM, stressing the need for inclusive and equitable governance with participatory processes that value different kinds of perspectives and expertise, and offered specific recommendations for stakeholders.

In a January 2026 answer to a parliamentary question, Commissioner Wopke Hoekstra reinforced this position, acknowledging potential environmental, public health and geopolitical risks, particularly when advancing SRM technologies without a clear international governance structure.

The April 2026 Council conclusions on EU energy and climate diplomacy warned that large-scale climate interventions, in particular SRM, pose significant risks for the climate, the environment, security and geopolitics. It called for full application of the precautionary principle to geoengineering, a close monitoring of initiatives, and a moratorium on the deployment of SRM. The conclusions reiterate that the EU 'will continue to engage in discussions on potential international governance arrangements, including research related aspects'.

European Parliament's position

The European Parliament resolution on the COP30 climate change conference, adopted in the October II 2025 plenary session, opposes deployment of SRM and insists that 'any pursuit of climate engineering must be guided by the precautionary principle'. It calls on the Commission to proactively negotiate a global SRM governance framework based on a firm stance of non-deployment and to strengthen the capability to detect any undeclared deployment. It advocates for an EU-wide moratorium on the use of SRM and calls on the Commission and EU Member States to ensure that any public funding for SRM research and risk assessment does not replace public funding for research on climate adaptation and mitigation.

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eprs@ep.europa.eu (contact)

https://eprs.in.ep.europa.eu (intranet)

www.europarl.europa.eu/thinktank (internet)

http://epthinktank.eu (blog)