Scientific Advice Mechanism
to the European Commission

22 March 2024

SAPEA expert workshop report

Solar radiation modification

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SAPEA evidence review report

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Summary

The expert workshop is a vital part of SAPEA's evidence review process. It provides a critique of the draft SAPEA evidence review report (ERR) by the wider expert community.

The workshop on solar radiation modification was held on 22 March 2024, as an online meeting. Participants included the invited experts, members of the working group, SAPEA representatives, the Group of Chief Scientific Advisors and staff of the European Commission.

The workshop format was as follows:

- After a general introduction to the evidence review report, a keynote speaker presented an overall assessment of the report, with initial observations on strengths, possible limitations and gaps.
- Each of the main sections was then introduced, followed by feedback from invited discussants and an opportunity for open discussion (where time allowed).

The suggestions for improvement to the draft report are summarised at the end of each discussant's feedback.

After the workshop, members of the working group considered the feedback and agreed on the actions that should be taken to address it. The draft evidence review report was then revised, prior to undergoing formal peer review. The final version has been published as a SAPEA evidence review report, and is available on the SAM website.[1]

1 https://scientificadvice.eu/advice/solar-radiation-modification/

Introduction

SAPEA's expert workshop is a vital part of the evidence review process. Its fulfils the following purposes:

- providing a critique of the draft SAPEA evidence review report by the wider expert community: invited experts to the workshop give informal feedback, offering constructive input to the working group that is producing the report
- developing further the conclusions and evidence-based policy options in the evidence review report

Experts attend and give their views in a personal capacity and not as representatives of their employer or any other organisation with which they are associated. Chatham House rules are observed, with no attribution to any individual.[2]

This workshop was conducted entirely online. A list of attendees is given in Annex 2 to this report.

[2] More information at: Chatham House Rule | Chatham House -- International Affairs Think Tank

Context and scope

The Scientific Advice Mechanism provides independent scientific evidence and policy recommendations to the European institutions, by request of the College of Commissioners.

The scoping paper[3] for solar radiation modification sets out the formal request for advice from the College of European Commissioners to the Group of Chief Scientific Advisors. The evidence review report by SAPEA synthesises the evidence, in response to the main questions from the scoping paper:

> How to address the risks and opportunities associated with research on Solar Radiation Modification and with its potential deployment? What are the options for a governance system for research and potential deployment, taking into account different SRM technologies and their scale?

[3] https://research-and-innovation.ec.europa.eu/system/files/2023-08/Scoping_paper_SRM.pdf

Report from the Expert Workshop

Introduction

The programme for the workshop is set out in Annex 3. A summary of each session is given below.

Welcome

All participants were warmly welcomed. They included invited experts, members of the working group and SAPEA representatives, members of the Group of Chief Scientific Advisors and staff of the European Commission and SAPEA (see Annex 2 for a list of attendees).

The Scientific Advice Mechanism and the need for this Scientific Opinion

The Scientific Advice Mechanism provides independent scientific evidence and policy recommendations to the European institutions, by request of the College of Commissioners.

The backdrop to the Scientific Opinion on solar radiation modification is that emissions are still increasing globally, rather than declining. A lot of attention has been given recently to SRM technologies, and the European Commission needs to be informed about research in SRM, risks and opportunities, and key questions around potential deployment, as well as international and EU governance.

Introduction to the SAPEA evidence review report

The evidence review report has set out to provide a balanced evidence synthesis on SRM. SRM is a controversial and contested topic. The introduction frames the debate for the report that follows, setting out the overarching goal of the report, which is how to address risks and opportunities of

research on SRM and its deployment, and what options exist for governance, taking into account different technical approaches and scales. The report also talks about different rationales for deployment, and some of the governance and ethical issues at stake. It mentions varying kinds of visions and imaginaries, before previewing the structure of the report.

Keynote summary

In this session, an invited keynote speaker presented an overall assessment of the draft report, with initial observations on strengths, possible limitations and gaps.

Consistency in terminology. In 2009, the Royal Society's report defined geo-engineering as "deliberate, large-scale manipulation of the planetary environment to counteract anthropogenic climate change" (Shepherd, 2009). We now use the term "climate intervention", as suggested by the National Academies (National Research Council, 2015). This is an example of where the report could be more consistent in its use of terms; another is "solar radiation modification" or "management".

History and background. There are a number of methods for doing SRM. Surface brightening goes back to the 1960s (Environmental Pollution Panel et al, 1965). 50 years ago, Mikhail Budyko suggested putting aerosols in the stratosphere (Budyko, 1974). However, not many people worked on it until Paul Crutzen (Nobel prize-winner) and Tom Wigley published papers in 2006.

Risks and benefits. There are many reasons why SRM may or may not be a good idea (Robock, 2016; Robock, 2020). We need to be able to make a risk-based decision, if we are ever to undertake implementation. If we could do it, what temperature should we set the planet to? If application were stopped, there would be rapid warming - the termination effect. By cooling the earth, there would be a reduction of precipitation in the summer over the monsoon regions of India and China.

Models. In 2008, a comparison of different models was published (Rasch et al., 2008). The models differed, and so a geoengineering model and comparison project (GeoMIP) was proposed (Kravitz et al., 2011). GeoMIP has produced 133 peer reviewed papers so far. Contrary to how the report is framed, models are very useful. Models are our laboratory. The only reason we worry about future changes from global warming is models as there are no observations of the future. Models will never be perfect, but they have been tested extensively on the past and on volcanic eruptions, so while we need to continue to improve them, we need them now to do our studies. For example, a paper from Kravitz et al. (2013) highlighted the problem of over-cooling the tropics and not cooling high latitudes as much, leading to sea level rise over Greenland and Antarctica. This resulted in controllers, where

sulphur is sprayed at different latitudes, at different times. Another paper on monsoons (Tilmes et al., 2013) highlighted the change in summer monsoon precipitation. A paper on the termination effect, showed rapid warming as a consequence (Jones et al., 2013).

Ecosystems impact. The report does not emphasise enough the impacts on ecosystems, on agriculture and biodiversity. A recent paper (Zarnetske et al, 2021) shows all the different ways that SAI could affect ecosystems. This is an area that has received insufficient attention and funding.

Slippery slope. Particularly challenging are human implementation, unintended consequences, governance and ethics. The 'slippery slope' to deployment may turn out to be a 'sticky slope' where, the more we research, the more we learn about the problems we face with SRM.

Indoor/outdoor research. The report does not distinguish between indoor research and outdoor research. Indoor research can be difficult to govern. Outdoor experiments, on the other hand, need governing because they can produce harmful effects. There are no mechanisms to do that, which is a real problem.

Summary of recommendations

The following to be considered:

- The report should be consistent in its use of terms: use 'climate intervention' and not 'geo-engineering'; use solar radiation 'modification' and not 'management'.
- The draft report is overly negative about the usefulness of models; models will never be perfect but we need to use them to look at the future, with and without SRM.
- There should be more emphasis on the impact on ecosystems, including agriculture and food security, and biodiversity.
- The draft report uses the 'slippery slope' to deployment argument but, conversely, research might raise awareness of the potential risks of SRM.
- The report should make clearer the distinction between indoor and outdoor research, and its governance.

Technological research, development and potential deployment (Part 1 of the evidence review report)

Introduction

This section is organised around the proposed solar radiation modification methods. It always starts with stratospheric aerosol injection, then cloud brightening, cloud thinning, surface brightening and space mirrors. Then we talk about effects, what is intended to be achieved, impacts which are maybe beyond the immediate climate target, and then side-effects. Chapter 4 covers technical and scientific requirements and prerequisites.

Summary of feedback from Discussant 1

Outdoor experiments. The report would benefit from more information on outdoor experiments that have been done or attempted before.

Rebalancing of material. Some rebalancing and streamlining of material could be helpful. Consider removing the topic of mixed phase cloud thinning, as there is insufficient evidence in the literature. Cirrus cloud thinning is a small research area, so could be reduced. Consider a synthesising table for the various methods.

Impacts. There could be more on things that affect us beyond the physical climate response, such as impact on food crops.

Technological requirements. More could be said about the actual SRM technologies. For example, you could add more information on technological requirements for any deployment. Also, technology readiness levels, in addition to having a bit more on monitoring, reporting and verification needs.

Role of scales. It would be helpful to consider the scale of potential deployment, particular as new methods and technologies come into the research field.

Terminology. Appropriate choice of terminology, as well as consistency, should be addressed. Acronyms should be spelled out.

Level of knowledge and uncertainty. There could be more of a summary of what we know and what we do not know, and our level of confidence on what we think we know.

Key messages. These should be reviewed, as currently some of them may be a little misleading. They should also reflect the chapter titles. Each sub-chapter could be rounded off with a concluding statement that can underpin the key messages.

Summary of recommendations

The following to be considered:

- Provide more information on outdoor experiments that have been tried or planned.
- Address imbalances in the report, and consider streamlining and a synthesising table on SRM methods.
- Say more about technological requirements for deployment, technological readiness levels, monitoring, reporting and verification needs.
- Consider the role of scales in any potential deployment.
- Address the inconsistency of terminology and use of acronyms.
- Provide summaries on levels of knowledge and uncertainty. Ensure key messages accurately represent what is said in the report.

Summary of feedback from Discussant 2

Imbalance and need for streamlining. There is imbalance between SAI and other radiation methods within the report. It would be helpful to streamline the structure so that the concepts, evidence and uncertainties, as well as more technical aspects, are covered in balance between the different methods, and that overarching topics (like new materials, studies on natural analogues for MCB, CCT and for SAI) are mentioned and receive attention.

Links between Part 1 and Part 2. There are no direct links between Parts 1 and 2. There should be a stronger focus on impacts and risk assessment. Sometimes, different studies are cited between the two Sections. It would be helpful to include a section on decision-making under uncertainty, in order to establish a link from climate model studies to impact. Make sure there is consistency in definitions between Parts 1 and 2, when it comes to research and deployment, for example, as well as long-term commitment.

Technical feasibility. Technical feasibility should be covered in a little more detail, and toned down in some areas where it is stated with too much confidence.

Terminology. Terminology and scales of deployment need to be aligned across different sections of the report.

Summary of recommendations

The following to be considered:

- better balance between SRM methods and more streamlining in the report
- stronger links and more consistency between Sections 1 and 2
- more detailed coverage of technical feasibility and toning down, where appropriate
- alignment and consistency of terminology, as well as scale of deployment

Summary of feedback from Discussant 3

Terminology. Use of the term 'mitigation' is different from what the IPCC defines as mitigation. Based on this, SRM is not strictly speaking a mitigation option.

IPCC options on SRM. It would be useful to refer to the IPCC's table of options on SRM.

Balance. Balance within the report, particularly with regard to SAI, should be examined.

Non-climate impacts. Consider indirect as well as direct impacts of SRM.

Termination effects. Termination effects should be considered more fully.

Recent developments. These should include the UNEA Assembly in Nairobi and the WCRP Lighthouse Activities, amongst others.

Summary of recommendations

The following to be considered:

- Address the use of terminology, particularly the term 'mitigation'.
- Refer to the IPCC's table of options on SRM.
- Consider the balance of the report between SRM methods.

- Examine indirect as well as direct impacts of SRM.
- Termination effects should be considered more fully.
- Add in recent developments, such as the UNEA Assembly.

Actors and public perceptions, feasibility conditions and constraints, and options for multilevel governance (Part 2 of the evidence review report)

Introduction

Part 2 aims to capture social science debates, governance aspects, politics and innovation. It starts with a figure that tries to visualise SRM as a socio-technical system. We call this the mutual construction of technology and society, or the social shaping of technology. The Section then goes through the 'slippery slope' framing, as well as the distinction between research and deployment. Chapter 5 draws on work done on actor networks and interest groups. Then there is a section on public and social perceptions. We do a thematic analysis of those approaches before we move to the final part, which is expert elicitation and perceptions of elites from earlier work, all the way up to more recent work published in the literature. Chapter 6, for now we have termed "feasibility, required conditions and normative implications". It gets into economic feasibility and issues of institutional and political feasibility. It also covers notions of geopolitical and security impacts and then finally, the ethics debate, justice debate, and then mitigation, deterrence, and moral hazard debate altogether. In Chapter 7, we start with a diagram about diversity of governance approaches and different rationales for governance, then a split between research governance and deployment governance. Finally, there is a whole section on law which we've named as 'State obligations under international law and legal principles'.

Summary of feedback from Discussant 1

Controversies in SRM research. It was surprising that the controversies around research on SRM are not mentioned more, such as projects like SPICE. These controversies explain the path dependencies in the debates, the positions of certain actors such as NGOs, and why different actor are relevant to research in the field.

Socio-technical systems. The figure on social-technical systems seems very isolated and not connected to the rest of Section 5. It should either be integrated better or left out. It is also inconsistent with desirability-feasibility dimensions (Gilabert & Lawford-Smith, 2012) that are used as structuring concepts in Chapter 6.

Better connection between chapters. Chapter 5 does not link well into Chapter 6, explaining why the public and certain actors are relevant, and how they influence political feasibility or non-feasibility. It would be good to explain how public and elite perceptions potentially tie in with institutions and political processes.

Public awareness and elite perceptions. Hardly anyone in the wider public of any country knows about SRM technologies; this finding from the literature should be discussed to put the results from public perceptions research into perspective. Currently there is no such thing as public opinion on SRM, though it might form in the future. Public perceptions of SRM as elicited by survey, focus groups or else are not the same as public opinion, which is additionally influenced by societal discourses. The results from an expert survey at the beginning of the section are not integrated sufficiently with the following section; if only 1.5% of respondents thought that publics and society were important or relevant "for the commercialisation, development, and/or acceptability of solar radiation management technologies", it should be explained why in the subsequent section public and communities' perceptions are considered in detail. Check also how the expert survey relates to findings in Part 1 and whether it is a suitable introduction to this section.

Summary of recommendations

The following to be considered:

- The report should mention past controversies around SRM research, and how these are relevant to actor networks in the field.
- Inconsistencies between Parts and Chapters should be tackled.
- The isolation of the socio-technical diagram in the introduction to the section should be addressed.
- The report should mention the low level of public awareness of SRM, and consider how expert survey results relate to other parts of the report.

Summary of feedback from Discussant 2

The literature is incredibly rich, and it is challenging to adequately reflect some of the tensions and coherence issues that come up when presenting different traditions and perspectives on the issues of SRM.

Defining feasibility. 'Feasibility' is a key framing concept in the report, but there is no explicit definition of feasibility used throughout the report. We then seem to get contrasting or even contradictory findings on different aspects of feasibility, and greater transparency and clarity on this is needed to avoid misunderstandings. The IPCC has a framework on feasibility, with a much more explicit definition; the IPCC has a lot to say about thresholds and risks in relation to particular dimensions of feasibility, and this might be useful.

Coherence across sub-sections. Sometimes, coherence across the sections was not as great as it could have been. The report could do a better job at pointing to the extensions between the different sections, between the different traditions. One example was between economic feasibility and governance concerns, for example. The normative section perhaps misses a chance to make the point independent of feasibility, and there is a large literature and governance context related to SRM that is separate to whether or not it is feasible.

Regional effects. Uncertainty over regional effects is underestimated; we should be careful about what we infer from the evidence that we know about regional effects. This links to what was said about regional precipitation, agriculture and ecosystems, for example. We should be quite careful about inferring global benefits and global effects, especially in a report addressed to policymakers. It might be a moment to say that global models that are being relied on might be methodologically limited as sources of information for regional effects.

Governance conditions. It was not clear what is meant by 'conditions' in the discussion of feasibility, and what would happen if these conditions were not fulfilled. Is there a red line, or does it not matter if governance of SRM is not necessarily democratic or legitimate? What is the takeaway for the reader, when presented with information for and against the possibility of legitimate or democratic governance, or normatively acceptable implementations?

Summary of recommendations

The following to be considered:

- 'Feasibility' should be defined as a concept, and types of feasibility need to be explained.
- The report needs greater coherence between parts, chapters and sections.
- Uncertainty over regional effects of SRM needs greater attention.
- Conditions for governance to be explained more clearly, within the context of policy.

Summary of feedback from Discussant 3

EU law. EU law is not addressed in the draft report, apart from a mention of the precautionary principle. Both primary EU law (Treaty on the Functioning of the European Union) and a variety of secondary EU legislation seem relevant, along with the issue of EU and Member State competencies.

Inconsistencies across the draft report. There are tensions and inconsistencies across the report, that need to be addressed. Key messages do not always fit with the content of the discussion in the same section or across sections.

Clarity on methods and approach. There is a need for greater clarity in this respect. What is the framework guiding the choice of literature and the criteria for its assessment (e.g. dimensions of "feasibility" in Chapter 6; themes of the literature discussed in Chapter 5)? According to what criteria is some literature discussed in greater detail than other (especially in Chapter 5)?

Imbalances. Several areas of the report give the impression of having a presumption that we should develop SRM. It is also important to delineate between assessment of the literature and interpretations or conclusions by the working group, some of which seem to go beyond synthesising the literature.

Governance. It should be clarified what levels of governance are being addressed. It is also important to distinguish between compliance and enforcement of treaties towards the parties, and participation and membership. There is also a question over the need for the section on 'soft law'.

Mitigation deterrence as a moral issue. The presentation of mitigation deterrence as a moral issue is potentially misleading. The issue is of fundamental importance also beyond ethics (costs/benefits, environmental impacts). There is also likely a trade-off between financing SRM and financing emission reductions.

Policy options. It should be clearer how these relate to the preceding discussion. At present, they at times seem to contradict the preceding discussion or not derive from it. There is also a need to provide balance and avoid privileging options in favour of the use of SRM.

Summary of recommendations

The following to be considered:

- The report should address EU law in greater detail.
- Inconsistencies and imbalances in favour of SRM use across the report should be rectified, and greater clarity on method and approach in terms of selection of literature and assessment criteria be provided.
- The discussion of governance issues should clarify the levels of governance addressed and distinguish between compliance/enforcement and participation/membership.
- Mitigation deterrence should be considered as a fundamental issue.

Discussion

Delineation between deployment and research versus technical feasibility. A discussant made the point that the delineation between deployment and research versus technical feasibility needed to be defined more clearly across Parts 1 and 2.

Conclusions and evidence-policy options (Chapter 8 of the evidence review report)

Introduction

This is an important chapter that is not yet fully developed. It contains evidence-based policy options, and not recommendations, which are the responsibility of the Group of Chief Scientific Advisors. We start the chapter with some general considerations for policy deliberation. The policy options are organised into three categories:

- SRM research
- possible deployment
- monitoring and simulation tools

Summary of feedback from Discussant 1

Chapter 8 is a very important chapter and is still at an early stage.

Overall framing. The overall framing of the report starts with the presumption that we understand from climate modelling that SRM can achieve global cooling, and that this will lead to reductions in climate impacts if you use SAI. This is a very strong presumption, and a problematic framing that could be misread by policymakers and is not consistent with the climate modelling evidence that we have. As we have heard already, SRM climate at the same temperature is very different from one controlled by greenhouse gas mitigation. We will have different warmings across different latitudes, different night/day temperatures, shifts in seasons. Local climates will be affected. The report should start with the lack of evidence that SRM will protect us from climate change in the way it is currently described in the report.

Impacts and risks. The highest priority for research is to prove there are benefits from SRM and for this we need modelling studies that can go beyond the very simplistic climate indicators that people have looked into, understanding the impact on human systems. There should be a discussion of non-optimal deployment and regional deployment and what this would mean for policymaking. Aspects of international security and peace are not really discussed, and these are important for EU policymakers. Before we start SRM deployment, we need a clear strategy for how phaseout would work. The risk framing of the report is problematic; there are important compound risks of SRM; if is used for peak shaving, then there will be a problem with phaseout and overshoot, which may lead into more speculative and controversial mitigation options.

Research. The conclusion of the need to increase SRM research funding means that other research may be crowded out, given that overall funding is limited. Even before starting SRM on a small-scale outdoors, it would be necessary to show the benefits, as these are not so clear in modelling studies right now.

Links with other bodies. Finally, it would be helpful to establish links with the EU's Advisory Body on Climate Change.

Summary of recommendations

The following to be considered:

- The framing of the draft report is that we understand from climate modelling that SRM can achieve global cooling and reduce climate impacts. There is a lack of evidence for this.
- Modelling studies need to go beyond climate indicators and be able to examine the impact on human and other systems.
- There should be a discussion on non-optimal deployment and regional deployment.
- International peace and security should be considered, within the context of SRM.
- Highlight the need for a clear strategy on phaseout, and consider the compound risks of SRM.
- Question the assumption that more research funding for SRM is needed; the benefits of small-scale outdoor experiments need to be shown.
- Establish links with the EU's Advisory Body on Climate Change.

Summary of feedback from Discussant 2

Structure. The overall structure of the report starts with the science first, but in many ways politics are more important and this calls for an integrated report.

Bias. The impression the report gives is one of bias in favour of presenting SRM as a positive and useful option. Summaries focus on positives; caveats appear only in detailed text. Modelling results are presented as if they are the results of real-world experiments. The language is unbalanced, literatures have been treated only partially. Benefits are presented as if 'known', while risks are described as 'potential'. The claim that global cooling can be achieved by SRM misrepresents the academic literature, and the warnings that you note throughout the report. Instead, it might be said that the literature suggests that global cooling could be achieved, although only within the presumed parameters and simplifications of the models.

Control measures for SRM. As acknowledged, the conclusions still need to be connected to the evidence base. Vitally, we need to find measures on how to control SRM, and this should include a ban on deployment, and an umbrella for research that does not trigger mitigation deterrence, which would lead to millions of additional deaths through air pollution if we continue to burn fossil fuels.

Research governance. All research needs to be subject to proportionate governance, including modelling. It is important to scale up governance when there is a likelihood of significant harms or

transboundary effects, and that can come from indoor as much as outdoor research, small-scale as well as large-scale. Standards for permitted research need to go beyond transparency to include questions of, for instance, funding limitations, ethics board pre-approval.

Modelling studies. These get a lot of inappropriate privilege. Instead we need social factors to determine what gets modelled, then outputs of modelling should be one input to more deliberative social and political research.

Regional and geopolitical considerations. There is a fundamental question over whether SRM would ever be accepted or agreed. Non-ideal scenarios, geopolitical and security risk issues should be covered. The Introduction does not mention geopolitical or cultural rationales for doing SRM.

Governance. The UNEA negotiations and other recent governance debates should be covered, including access to information, knowledge politics, epistemic justice.

Public and expert views. Studies have different methodologies and values, for different purposes. Citizen assemblies go through a process of education, with a more meaningful and deliberative outcome.

Feasibility and ethics. Ethical decisions must precede any consideration of feasibility.

Summary of recommendations

The following to be considered:

- better integration throughout the report between the science and the politics
- addressing bias in language and choice of literature
- how to control SRM deployment and allow research in such a way that does not trigger mitigation deterrence
- research governance for both indoor and outdoor, small- and large-scale
- modelling studies as forms of input to deliberative social and political research
- regional and geopolitical considerations, including security risks
- include recent governance debates
- citizen assemblies as a form of deliberative process that may lead to a more meaningful outcome
- ethical decisions must precede consideration of feasibility

Annexes

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List of attendees

Invited experts

- Dominic Lenzi, Assistant Professor, Twente University
- Duncan McLaren, Climate Intervention Fellow in Environmental Law and Policy, University of California Los Angeles (UCLA)
- Christine Merk, Deputy Director Research Centre Global Commons and Climate Policy, Kiel Institute for the World Economy
- Helene Muri, Professor, Norwegian University of Science & Technology (NTNU)
- Sebastian Oberthür, Director of Research Centre for Environment, Economy and Energy, Brussels School of Governance
- Keywan Riahi, Director of the Energy, Climate and Environment Programme, International Institute for Applied Systems Analysis (IIASA)
- Alan Robock, Distinguished Professor, Rutgers University
- Isabelle Steinke, Associate Professor, TU Delft
- Jean-Pascal van Ypersele, Professor Emeritus, Université catholique de Louvain

Members of the working group

- Roberto Cantoni
- Gabriel Chiodo
- Olaf Corry
- Ilias Fountoulakis
- Oliver Geden
- Aarti Gupta
- Clare Heyward
- Hannele Korhonen
- Axel Michaelowa
- Andreas Oschlies
- Johannes Quaas

- Florian Rabitz
- Herman Russchenberg
- Benjamin Sovacool
- Simone Tilmes

Members of the Group of Chief Scientific Advisors

- Naomi Ellemers
- Nicole Grobert
- Eric Lambin
- Nebojša Nakićenović
- Eva Zažímalová

Members of the European Group on Ethics

- Nils-Eric Sahlin

Members of the European Commission

- Bence Börcsök
- Annabelle Ascher
- Gilles Laroche
- Jim Dratwa
- Karen Fabbri
- Nikolaos Stilianakis

Other invitees

- Livia Bianca Fritz
- Rolf-Dieter Heuer
- Sean Low
- Rafael Carrascosa Marzo

SAPEA staff

- Louise Edwards

- Stephany Mazon

SAPEA representatives

- Paolo Papale
- Meg Kisleva
- Ole Petersen

Programme

Time (CET)	Session
14:30-14:35	Welcome; introduction to the workshop (Professor Paolo Papale, SAPEA; Professor Ole Petersen, SAPEA)
14:35-14:45	Quick overview of the Scientific Advice Mechanism, the need for this Scientific Opinion and the role of SAPEA (Nebojša Nakićenović and Eric Lambin, Group of Chief Scientific Advisors; Louise Edwards, SAPEA)
14:45-14:55	Overview of the SAPEA Evidence Review Report on solar radiation modification (Johannes Quaas, Benjamin Sovacool)
14:55-15:15	Keynote: overview of the evidence review report, with observations on strengths, possible limitations and gaps (15 minutes); Discussion (5 minutes)
15:15-16:00	Part 2: Overview (5 minutes), Benjamin Sovacool; Response by 3 discussants (10 minutes each); Discussion (10 minutes)
16:00-16:10	Short break
16:10-16:55	Part 1: Overview (5 minutes); Response by 3 discussants (10 minutes each); Discussion (10 minutes)
16:55-17:20	Chapter 8: Overview (5 minutes), Johannes Quaas; Response by 2 discussants (5 minutes each); Discussion (10 minutes)
17:20-17:30	Closing remarks and next steps

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