Bundesamt für Umwelt BAFU
Office fédéral de l'environnement OFEV
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Uffizi federal d'ambient UFAM
Federal Office for the Environment FOEN



Swiss Confederation

# Perspectives on Solar Radiation Modification Governance

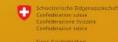
12 October 2023 | 10:00–12:00 CEST International Environment House II & Webex



# **Technical Information**

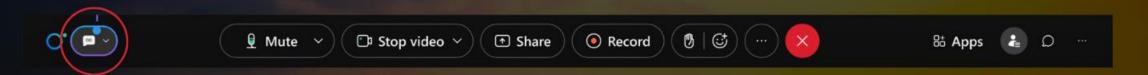
- Throughout the event, you may raise your questions in the Q&A box
- Automatically translated subtitles in many languages are available through the captions button on the bottom left of your screen
- The recording, summary and documents will be made available on the event's website



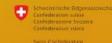


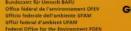


# ENGLISH CAPTIONS CAN BE ACTIVATED BY CLICKING ON THE BOTTON ON THE LEFT-SIDE OF THE BOTTOM BAR ON THE SCREEN











12 OCT 2023 | 10:00-12:00 CEST

# **SPEAKERS**

By order of intervention.



H.E. Amb. Felix WERTLI



Switzerland Ambassador for the Environment | Chair



# **Andrea HINWOOD**

UN @

Chief Scientist, UN Environment Programme



# Patrycja SASNAL



Member of the Advisory Committee to the Human Rights Council | Head of Research, Polish Institute of International Affairs



# **Anthony PATT**



Lead, Climate Policy Lab, ETH Zürich |
Coordinating Lead Author, International
Cooperation Chapter, WGIII AR6, IPCC



# **Pascal LAMY**





Chair, Climate Overshoot Commission | Vice President of the Paris Peace Forum; former Director-General, WTO



# Cheikh Ndiaye SYLLA



Director of Ministerial Cabinet for Environment and Sustainable Development, Senegal



# Marie-Valentine FLORIN

EPFL ingo

Secretary General, International Risk Governance Council (IRGC) Foundation



# Lili FUHR

GIEL

Director, Fossil Economy Program, Center for International Environmental Law



12 OCT 2023 | 10:00-12:00 CEST

# **AGENDA**

# **Opening**

· H.E. Amb. Felix WERTLI | Switzerland Ambassador for the Environment | Chair

### What has been said about Solar Radiation Modification?

# **UNEP Independent Expert Review**

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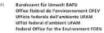
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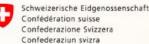


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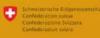


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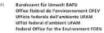
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# UNEP Independent Expert Review

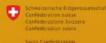


# **Andrea HINWOOD**



Chief Scientist, UN Environment Programme





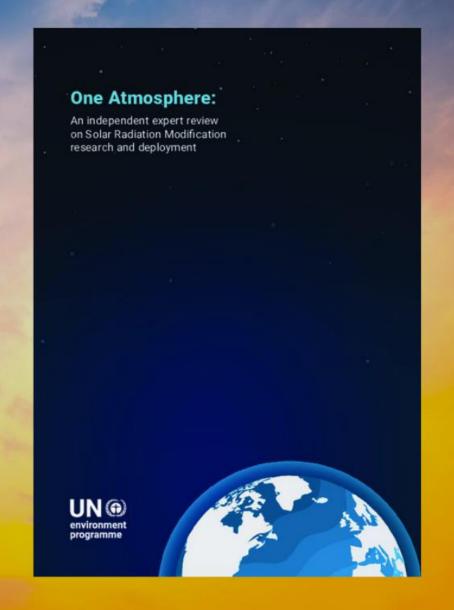


# One Atmosphere:

An independent expert review on Solar Radiation Modification research and deployment



unep.org/resources/report/Solar-Radiation-Modification-research-deployment





# 'One Atmosphere: An independent expert briefing on Solar Radiation Modification (SRM) research and deployment'

Dr. Andrea Hinwood Chief Scientist, United Nations Environment Programme 12 October 2023

# Background

- The IPPC continues to warn the world is not on track to meet the Paris Targets and that drastic and rapid cuts in greenhouse gas (GHG) emissions are critical to avoid global mean warming increasing the frequency and intensity of extreme weather, the melting of polar and glacial ice, and sea level rise, among other changes in the Earth system
- As the global community grapples with the climate crisis, Solar Radiation Modification (SRM), also called geoengineering and climate altering technologies and measures (CATM) (highly controversial technologies) being increasingly scrutinised, discussed, debated and researched as a potential approach to offset climate change impacts and avoid global temperature overshoot
- Debate on these possible technologies is polarized



# SUN STRATOSPHERIC **AEROSOL** ~16-25 KM Increased scattering by Stratospheric Thining high clouds to allow more heat to escape Increased scattering by

# What is SRM?

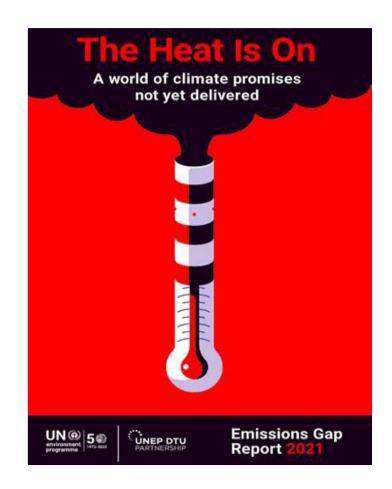
- Solar Radiation Modification technologies that aim to cool the planet
- SRM does not reduce, remove or manage GHG emissions
- Stratospheric aerosol injection (SAI)
   specifically, is being studied and discussed
   as an "emergency" method involves
   injection of aerosols into the stratosphere
- Modelling studies indicate a large-scale continuous SRM deployment could offset some effects of greenhouse gases on global and regional scales
- Volcanic eruptions give us some indication of the potential to cool the planet

# What we know and don't know

- Limited literature on uncertainties and risks of impacts
- No international scientific consensus on the risks of SRM
- The cooling effects of SRM would start to diminish as soon as the SRM deployment is halted – potential termination shock.
- Could delay closing of ozone hole
- Impacts such as warming of polar regions. Cooling of tropics
- Research in this field is seen as the slippery slope to deployment.
- These technologies are seen as potentially influencing geopolitics, introducing security risks and aiding developed countries at the expense of developing countries/ economies; economies already deeply impacted by changes to the environment and climate.

# Some Key Concerns

- The limited focus on potential environmental impacts
- Decisions about SRM experimentation and deployment would not be made in a globally inclusive, equitable and transparent manner
- SRM discussions might shift financial, political and intellectual resources from mitigation and adaptation efforts (the 'moral hazard' problem)
- There is no governance over (i) research, (ii) indoor experimentation, (iii) small scale or (iv) large-scale outdoor deployment



# **Concluding Remarks**

- The UN is not promoting research but recognizes that research is on foot.
- SRM does not solve the problem of climate change
- SRM technologies are fraught with uncertainties on the potential risks and impacts, compounded by complex issues of ethics and governance.
- A precautionary approach is required
- There is need to bring a level of scientific discipline and evidence to the table to further broaden the global understanding and engagement in the discussion of SRM.
- It is important to maintain neutrality to what has become a polarized debate potentially distracting from action on climate change
- Discussions could be initiated regarding what form a governance framework might take



# Thank you

Andrea Hinwood Chief Scientist UNEP andrea.hinwood@un.org

United Nations Avenue, Gigiri PO Box 30552 – 00100 GPO Nairobi, Kenya www.unep.org

12 OCT 2023 | 10:00-12:00 CEST

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• H.E. Amb. Felix WERTLI | Switzerland Ambassador for the Environment | Chair

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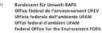
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# Advisory Committee of the Human Rights Council



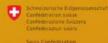
# Patrycja SASNAL





Member of the Advisory Committee to the Human Rights Council | Head of Research, Polish Institute of International Affairs







# Report of the Human Rights Council Advisory Committee Impact of new technologies intended for climate protection on the enjoyment of human rights



undocs.org/en/A/HRC/54/47

United Nations

A/HRC/54/47



### General Assembly

Distr : General 10 August 2023

Original English

Human Rights Council
Fifty-Fourth session
II September-October 2023
Agenda items 3 and 5
Promotion and protection of all human rights, civil,
political, economic, social and cultural rights,
including the right to development

Human rights bodies and mechanisms

Impact of new technologies intended for climate protection on the enjoyment of human rights

Report of the Human Rights Council Advisory Committee\*. \*\*

GE.23-13616 (E) 090823 090823



Agreement was reached to publish the present report after the standard publication date owing to circumstances beyond the submittee's control.

<sup>\*\*</sup> The annex is being circulated as received, in the language of submission only.

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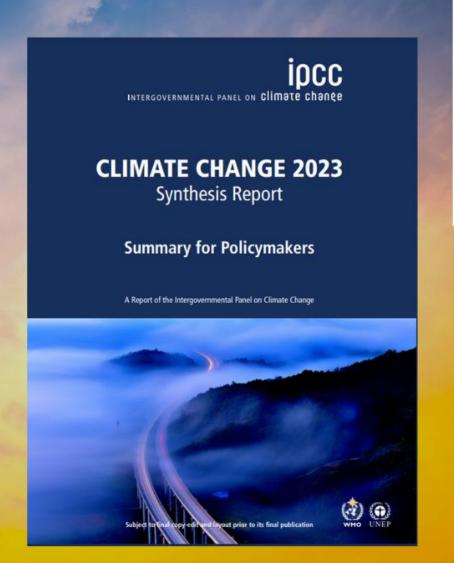
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IPCC Assessment Reports
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ipcc.ch/reports/

# IPCC Assessment Reports

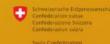


# **Anthony PATT**



Lead, Climate Policy Lab, ETH Zürich | Coordinating Lead Author, WGIII Sixth Assessment Report, Intergovernmental Panel on Climate Change







# Risk and governance aspects of **Solar Radiation Modification**

**Anthony Patt** Professor of Climate Policy, ETH Zürich IPCC AR6 Working Group III Coordinating Lead Author on this topic

Presentation to Geneva Environment Network, 12.10.2023







International Cooperation Chapter 14

# **Cross-Working Group Box 4 | Solar Radiation Modification**

Authors: Govindasamy Bala (India), Heleen de Coninck (the Netherlands), Oliver Geden (Germany), Veronika Ginzburg (the Russian Federation), Katharine J. Mach (the United States of America), Anthony Patt (Switzerland), Sonia I. Seneviratne (Switzerland), Masahiro Sugiyama (Japan), Christopher H. Trisos (South Africa), Maarten van Aalst (the Netherlands)

### **Proposed Solar Radiation Modification schemes**

This cross-working group box assesses Solar Radiation Modification (SRM) proposals, their potential contribution to reducing or increasing climate risk, as well as other risks they may pose (categorised as risks from responses to climate change in the IPCC AR6 risk definition in 1.2.1.1), and related perception, ethics and governance questions.

SRM refers to proposals to increase the reflection of shortwave radiation (sunlight) back to space to counteract anthropogenic warming

# (5 pages)

SRM technologies with broader public participation and political legitimacy, guarding against potential risks and harms relevant across a full range of scenarios, and ensuring that SRM is considered only as a part of a broader portfolio of responses to climate change (Stilgoe 2015; Nicholson et al. 2018). For SAI, large-scale outdoor experiments even with low radiative forcing could be transboundary and those with deployment-scale radiative forcing may not be distinguished from deployment, such that MacMartin and Kravitz (2019) argue for continued reliance on modelling until a decision on whether and how to deploy is made, with modelling helping governance development.

# 14.4.5.1 Global Governance of Solar Radiation Modification and Associated Risks

Solar radiation modification, in the literature also referred to as 'solar geoengineering', refers to the intentional modification of the Earth's shortwave radiative budget, such as by increasing the reflection of sunlight back to space with the aim of reducing warming. Several

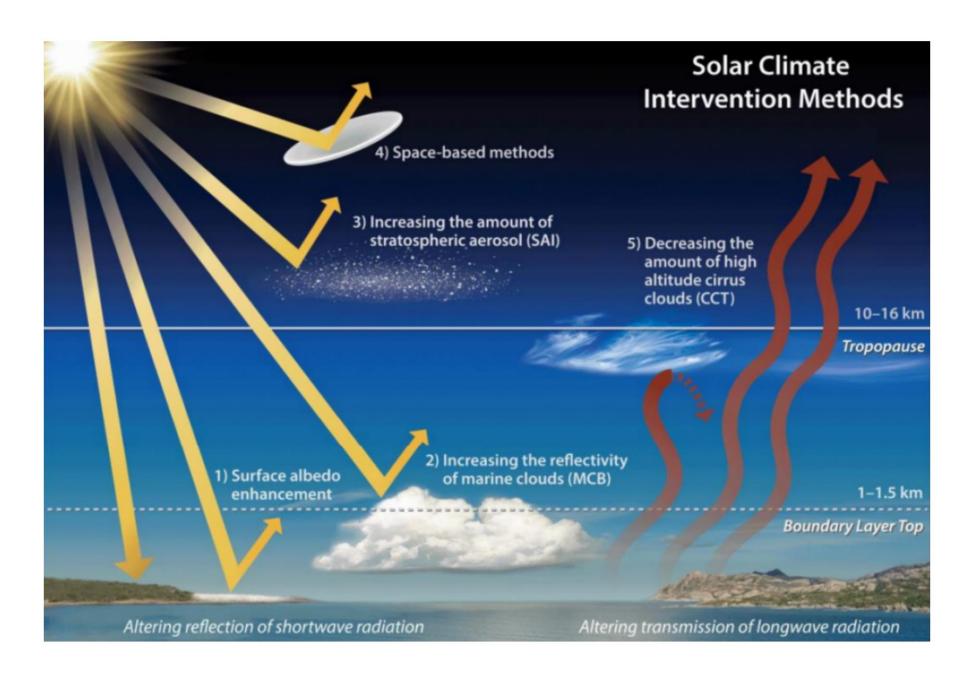
While there is room for national and even sub-national governance of SAI – for example on research (differentiating indoor from open-air) (Jinnah et al. 2018; Hubert 2020) and public engagement (Bellamy and Lezaun 2017; Flegal et al. 2019) – international governance of SAI faces the challenge that comprehensive institutional architectures designed too far in advance could prove either too restrictive or too permissive in light of subsequent political, institutional, geophysical

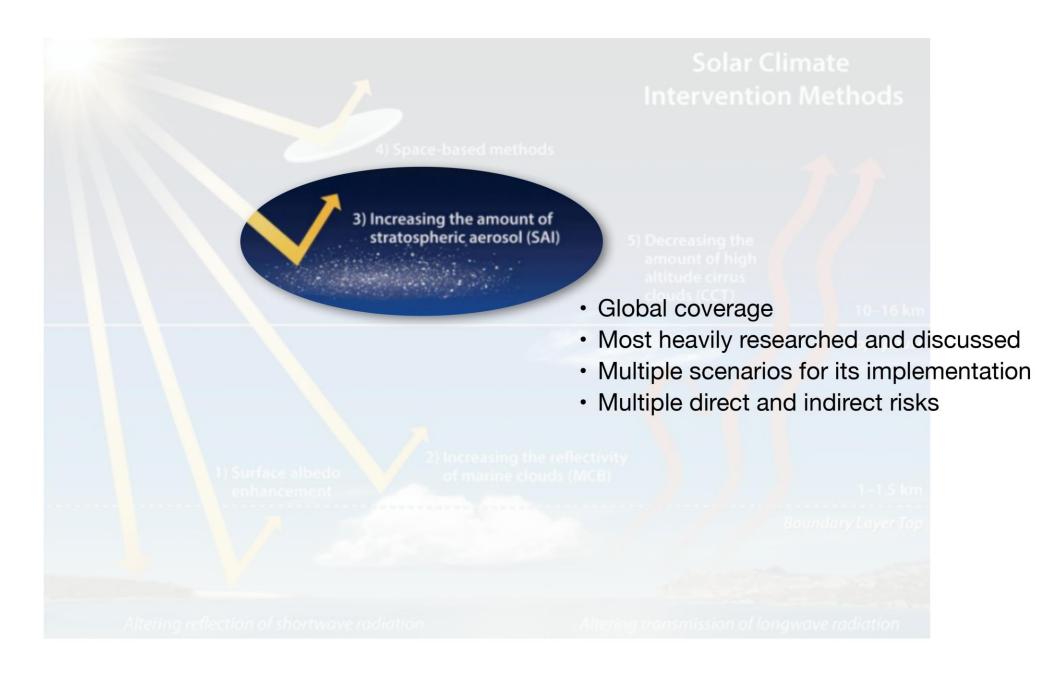
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# **IPCC** coverage

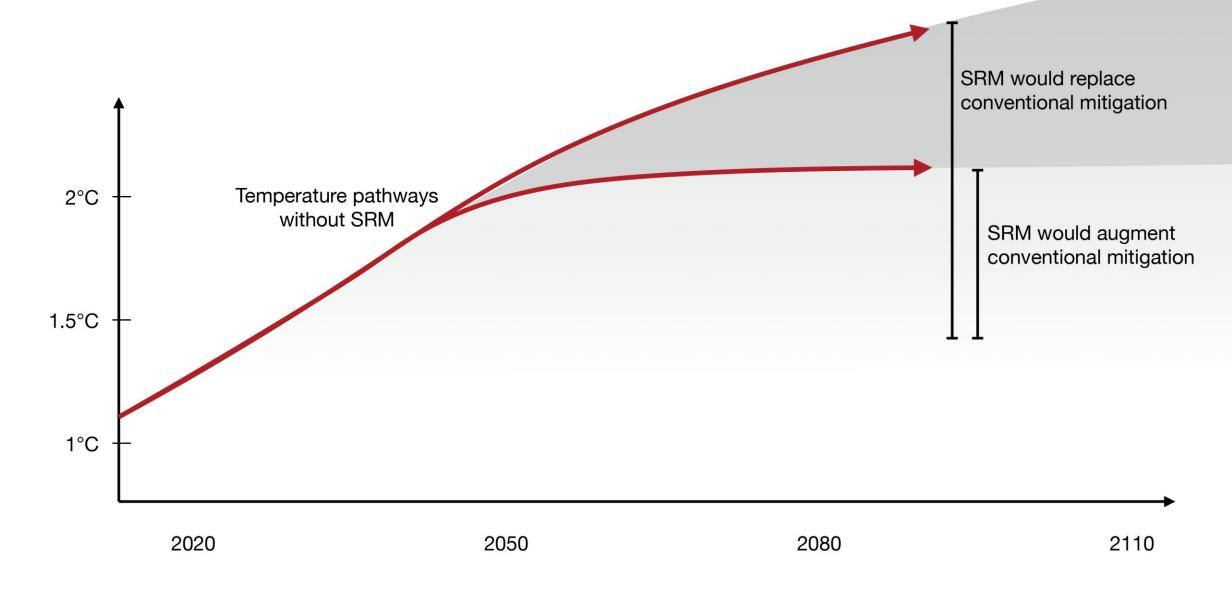
- methods
- scenarios
- risks
- public perception
- ethics
- · governance

 deeper dive into governance

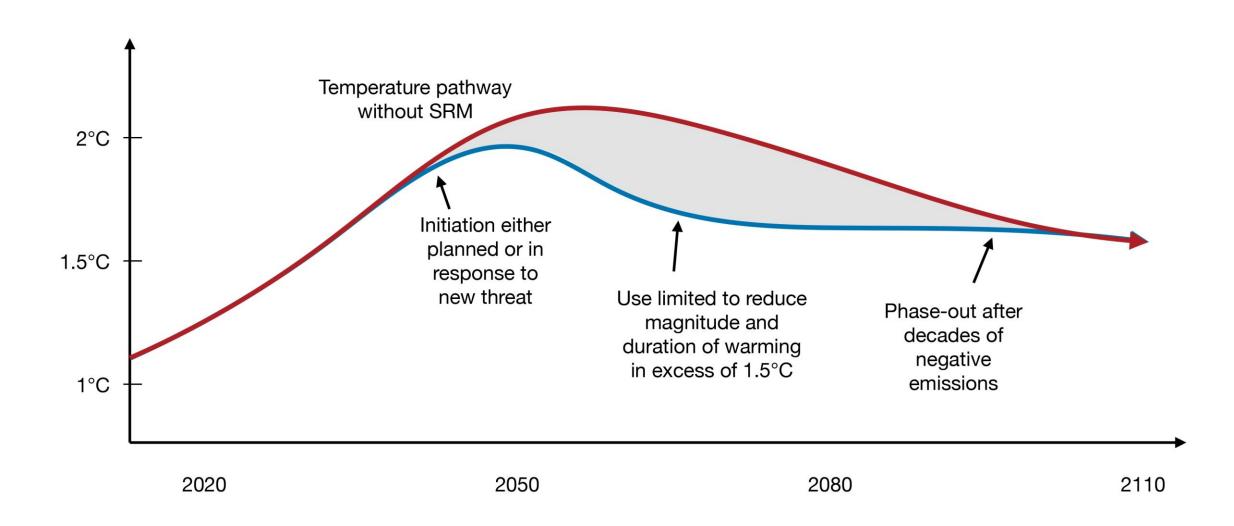




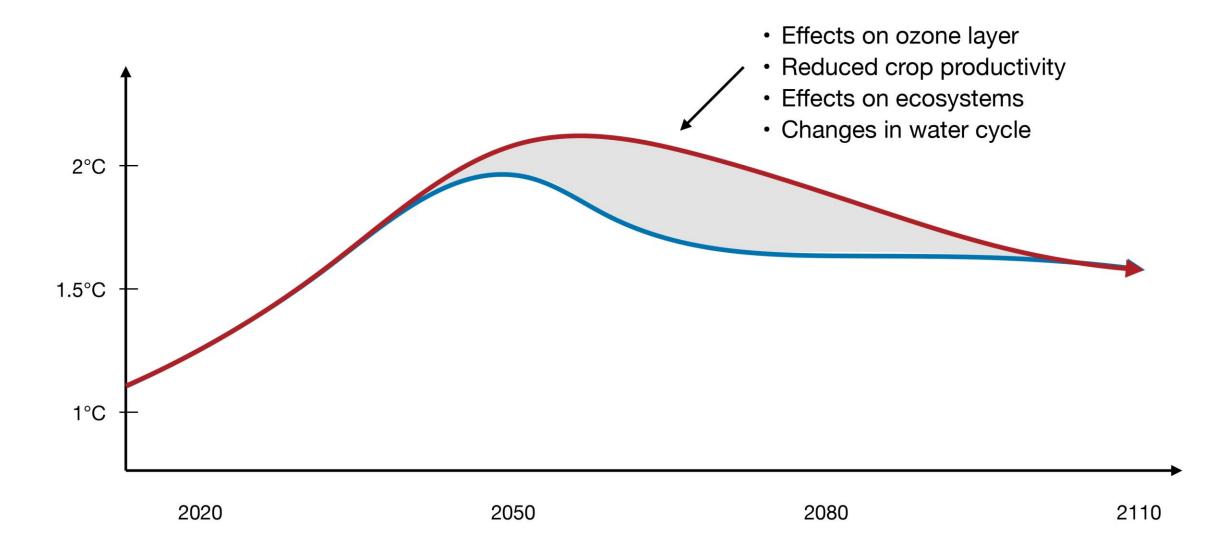
# **Permanent SRM use scenarios**



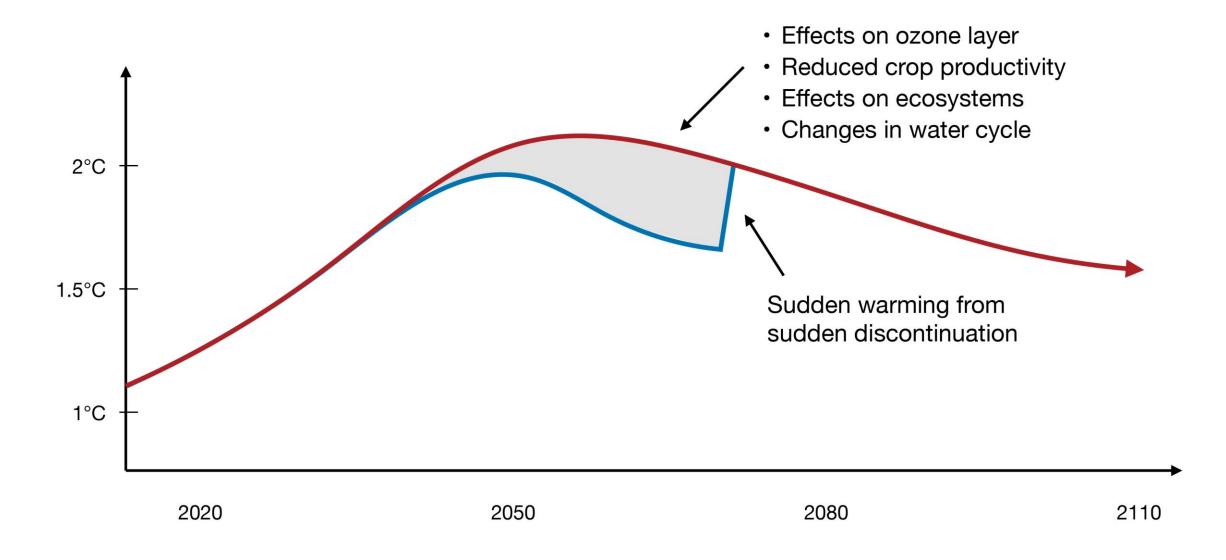
# Peak-shaving use scenario

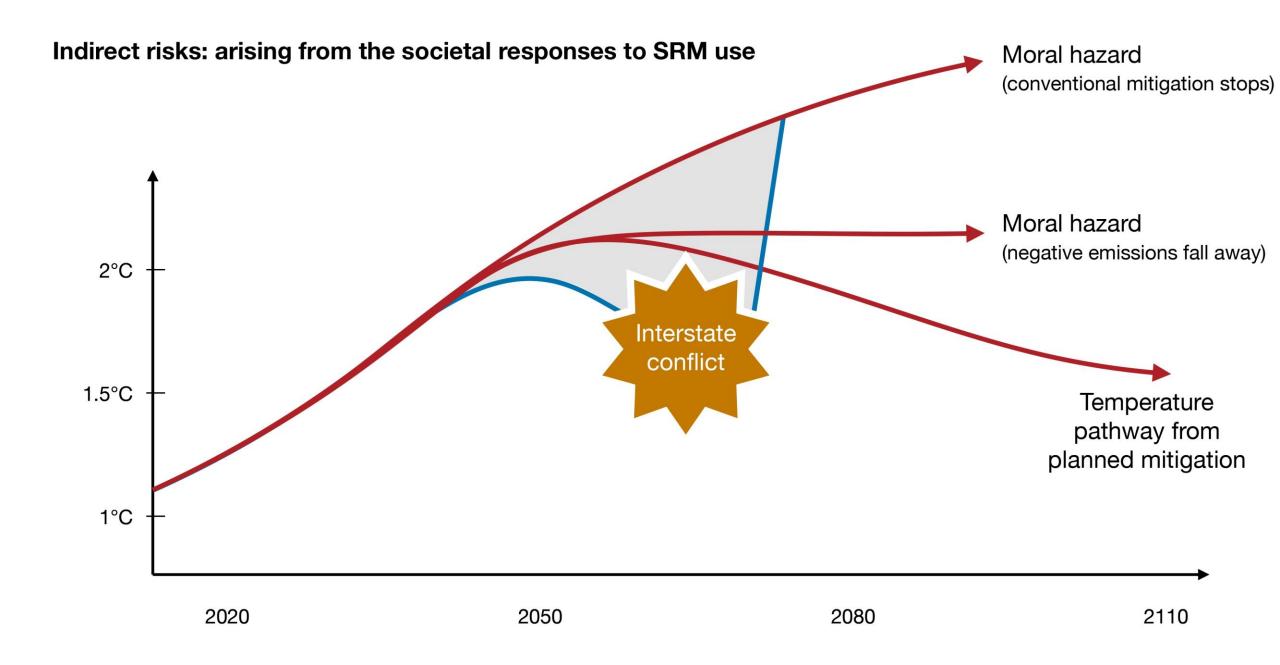


# Direct risks: physical impacts associated with its use



# Direct risks: physical impacts associated with its use





Decide and plan never to use

Prepare to use if future events warrant it

Decide to use

#### **Governance needs**

Global non-use agreement

#### Agreements covering:

- Research and testing
- Conditions of use
- Coordination and governance of use

#### Agreements covering:

- · Research and testing
- Coordination and governance of use

#### **Current political status**

- Each of the three standpoints have support within NGO and scientific communities.
- No state has formally signalled support for any of the standpoints, although some have implicitly signalled support for the middle standpoint.
- Full disclosure: I have signed a statement, led by scientists, supporting the middle standpoint

#### Near-term objectives of global governance

H

Guard against potential risks and harms

2

Enable appropriate research and development

3

Foster transparency to legitimise future decisions

4

Ensure that SRM is only one part of a broader policy portfolio

Guard against potential risks and harms

Enable appropriate research and development

Foster transparency to legitimise future decisions

Ensure that SRM is only one part of a broader policy portfolio

#### Develop a transparency mechanism

Scientific & technical information; project development and legal compliance; funding sources and use

#### Establish a global forum

A venue for dialog between state, non-state, and multi-lateral organisations leading to potential agreements

#### Incorporate SRM into the Global Stocktake under Paris

Provide guidance into fit between SRM and other Paris objectives and mechanisms

#### **Concluding thoughts**

- SRM is highly politicised, and its various dimensions overlap with sharp ideologically driven perspectives and principles.
- For scientists, there are strong perceived risks associated with saying anything about SRM governance, due to the likelihood of being seen as engaged in advocacy.
- It might be good to normalise discussions of SRM governance sooner rather than later.

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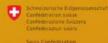
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PARIS PEACE FORUM PARIS

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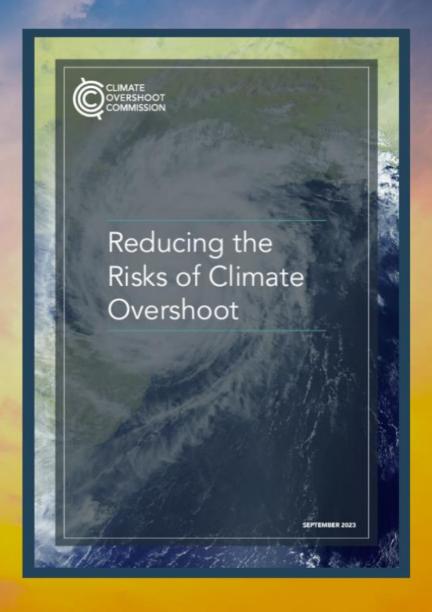




#### Climate Overshoot Report Reducing the Risks of Climate Overshoot



overshootcommission.org/report



Geneva Environment Network





Climate Overshoot Commission

12<sup>th</sup> of October 2023 10 am CET -12 pm CET



# THE CLIMATE OVERSHOOT COMMISSION





PASCAL LAMY



HINA RABBANI KHAR



KIM CAMPBELL



AGNES KALIBATA



FRANCES BEINECKE



ARANCHA GONZALEZ



ANOTE



MAHAMADOU ISSOUFOU



JAMSHYD GODREJ



XUE



MUHAMAD CHATIB BASRI



LAURENCE TUBIANA





#### Solar radiation modification



**First**, countries should adopt a moratorium on the deployment of solar radiation modification (SRM) and large-scale outdoor experiments. The moratorium should apply to any intervention with risk of significant transboundary harm, regardless of where it occurs, who carries it out or is responsible for it, what form it takes, or for what purpose.

**Second**, governance of SRM research should be expanded.

**Third**, in parallel with strengthening SRM gover- nance, SRM research should also be strengthened; and the two should coevolve.

**Fourth**, an international, independent scientific review and assessment of the best available evidence from SRM research should take place every few years.

**Fifth**, because the potential use of SRM raises multiple concerns, including novel and severe gover- nance challenges, broad consultations and dialogues on these issues are needed.

#### Space-based reflectors



Stratospheric aerosol injection



Cirrus cloud thinning



Marine cloud brightening

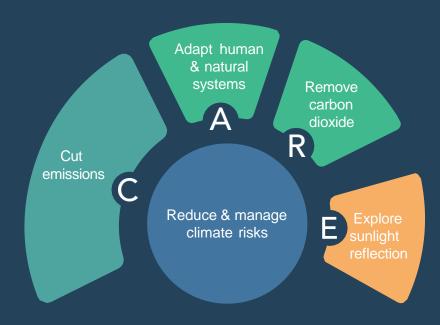




## CARE AGENDA FOR POSSIBLE OVERSHOOT

Pursuing any single approach to reducing risks from overshoot-emissions reductions, adaptation, carbon removal, possibly SRM-may influence the effectiveness of other approaches. Both positive and negative spillovers must be identified and managed within a holistic framework. Overall, the recommendations made by the Commission can be conceptualized as constituting integrated components of a "CARE Agenda" for reducing risks from climate overshoot.







#### **Cut** emissions

Accelerate emissions reductions and consolidate decarbonization.



#### **Adapt**

Expand adaptation and fully mainstream into development.



#### Remove

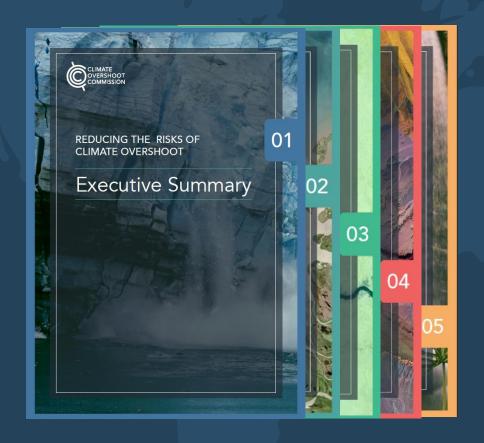
Develop and deploy higher-quality carbon dioxide removal to help achieve net-zero emissions targets and beyond.



#### **Explore**

Adopt a moratorium on large-scale solar radiation modification and expand research and governance dialogue.





- Contact:
  info@overshootcommission.org
- Visit our Website to read our report Overshootcommission.org/report
  - in LinkedIn
  - <u>Twitter</u>

12 OCT 2023 | 10:00-12:00 CEST

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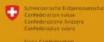


#### **Cheikh Ndiaye SYLLA**



Director of Ministerial Cabinet for Environment and Sustainable Development, Senegall







## African Perspectives on Solar Radiation Management

Cheikh Ndiaye SYLLA

12 oct

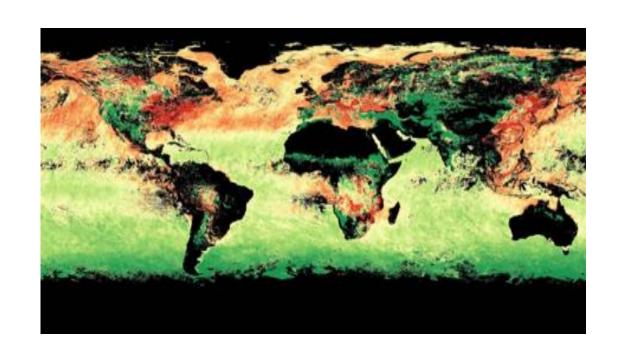
Genève

STEPS 1

#### STUDY ON GEOENGINEERING AND AFRICAN PERSPECTIVES:

#### PROBLEMS, VULNERABILITIES, ELEMENTS FOR POSITIONING AND REFINING AFRICA ON GEOENGINEERING AND ITS GOVERNACE

**SRM ISSUES FOR AFRICA** 



#### STEPS 2

STUDY AFRICAN CLIMATE CHANGE GROUP WORKSHOP ON GEOENGINEERING, NAIROBI, KENYA, 13 and 14 January 2022

**SUMMARY OF KEY MESSAGES AND HIGHLIGHTS** 

### AFRICAN CLIMATE CHANGE GROUP WORKSHOP ON GEOENGINEERING, NAIROBI, KENYA, 13 and 14 January 2022 SUMMARY OF KEY MESSAGES AND HIGHLIGHTS

Hybrid format in Nairobi on the 13-14 January 2022, to begin creating awareness on the risks, impacts, opportunities, and other implications for Africa.

In the discussion participants highlighted that, Africa is deeply concerned that:

- . Current levels of global ambition of commitments to address the global climate change crisis
- . This will result in severe impacts on the continent already extremely vulnerable
- . That the potential impacts of SRM technologies will add a further burden on a continent

- Further, Africa is also extremely concerned on the focus of financing experimentation:
  - Actual and real reductions in global GHG emissions at source; and
  - Building of resilience and adaptative capacity, particularly in developing countries.
- Additionally, Africa is concerned that a focus on negotiating a governance system for these emerging SRM technologies will take time, and potentially further divert political will and resources away from obligations to implement and finance proven policies, technologies, and measures under the UNFCCC framework.

 In the light of these concerns, and high degrees of uncertainty around these technologies, Africa should not support their application at this stage

 but should rather support the development of an authoritative scientific synthesis and review of the state of knowledge of these technologies

 This scientific assessment should be conducted by a mandated body such as the IPCC

- Africa is further concerned, that the SRM technologies:
  - In terms of the current state of knowledge, will have potentially severe transboundary impacts and implications across multiple sectors and areas of legal jurisdiction.
  - Given the global and transboundary nature, it is important to be considered by relevant mandated bodies within the UN system involving, AMCEN at scientific, technical, political, and legal levels.

- While recognising the importance of international controls to prevent unilateral advancement of SRM technologies, Africa is not yet ready to support any engagement on possible broader international governance matters related to these technologies given the above-mentioned:
  - Limited levels of understanding; and
  - Considering that existing bodies within the UN system have the mandate to address any immediate geo-engineering concerns that may arise.
  - The African Group of Negotiation on Climate, will develop further consideration and report to AMCEN, for decision making

#### STEPS 3 ....

- SRM aims to increase albedo e.g. injecting aerosols (SOx, or engineered nanoparticles into the stratosphere...); covering deserts with plastic; painting mountains; space shields...
  - What stage: conceptual, proposal and preliminary laboratory research, in implementation?
- Combined with mainstream mitigation and adaptation measures CATM has potential to significantly ameliorate CC impacts
- Distinguish from CDR may require different treatment
- No report yet from the AGN
- Need an African view: when?



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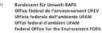
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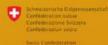
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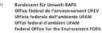
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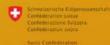


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Director, Fossil Economy Program, Center for International Environmental Law







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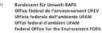
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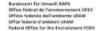
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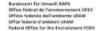
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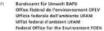
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# THANK YOU FOR JOINING!



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Switzerland Ambassador for the Environment | Chair



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Chief Scientist, UN Environment Programme



# Patrycja SASNAL

Member of the Advisory Committee to the Human Rights Council | Head of Research, Polish Institute of International Affairs



# **Anthony PATT**

IDCC ++ ETH zürich

Lead, Climate Policy Lab, ETH Zürich Coordinating Lead Author, International Cooperation Chapter, WGIII AR6, IPCC



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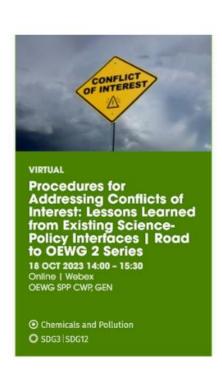
Briefing on the 3rd Session of the Intergovernmental **Negotiating Committee to Develop an International Legally** Binding Instrument on Plastic Pollution (Plastic Pollution INC-3)

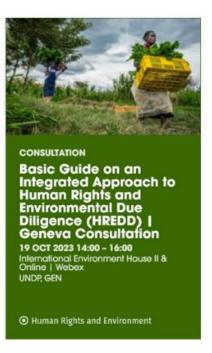


# WHAT'S NEXT?











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Office fédéral de l'environnement OFEV
Ufficio federale dell'ambiente UFAM
Uffizi federal d'ambient UFAM
Federal Office for the Environment FOEN



Swiss Confederation

# Perspectives on Solar Radiation Modification Governance

12 October 2023 | 10:00–12:00 CEST International Environment House II & Webex

