Carnegie Climate Geoengineering Governance Initiative

an initiative of CARNEGIE COUNCIL for Ethics in International Affairs

Workshop proceedings

Governing Solar Geoengineering and Carbon Removal

United Nations, Nairobi, Kenya, 23 May 2018

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Summary

On 23 May 2018, the Carnegie Climate Geoengineering Governance Initiative (C2G2) convened a workshop in collaboration with the UN Environment Programme (UNEP) at the United Nations in Nairobi, Kenya. The workshop brought together 20+ government, civil society and academic participants to learn about and discuss the governance of new experimental technologies known as Solar Geoengineering and Carbon Removal. Discussions were stimulated by short presentations from international experts and commentary provided by leading voices from international organisations, academia, research and civil-society groups. During the workshop, participants also engaged in an interactive game that explored the challenges of balancing development needs with managing climate risk and the importance of effective governance.

C2G2 is grateful to all speakers and workshop participants who contributed to this important discussion and to the UNEP for collaboration in convening this workshop and preparation of the workshop report.

Presentations and resources are available from the workshop page on the UNEP website[1].

[1] http://web.unep.org/about/cpr/events/briefings-secretariat/carnegie-climate-geoengineering-governance-initiative-workshop

Background

1. During May 2018, in collaboration with the UN Environment Programme (UNEP), the Carnegie Climate Geoengineering Governance Initiative (C2G2) organised a briefing and a workshop for representatives to the UN Environment Assembly (UNEA) to learn about emerging approaches for addressing climate change known as Solar Geoengineering and Carbon Removal and begin to consider how they might be effectively governed.

2. The briefing (22 May) was convened for the UN Environment Programme's Committee of Permanent Representatives (CPR). Further information, presentations and background materials and a summary of the briefing can be found on the UN Environment website[2].

3. The workshop (23 May) was convened to allow participants from UN Member States and others more in-depth insight into Solar Geoengineering and Carbon Removal technologies from presentations by leading international researchers and commentators. As well as an opportunity for learning, the workshop facilitated discussion about the need for more comprehensive governance of research and decision-making around the potential deployment of these emerging technologies as part of a global risk management approach for addressing climate change. Further information, presentations and background materials can be found on the UN Environment website3.

4. Workshop presenters included:

- Dr. Wenjian Zhang
  Assistant Secretary General, World Meteorological Organisation (WMO)
- Prof. Douglas MacMartin
  Professor of Computing and Mathematical Sciences, California Institute of Technology and Senior Researcher in Mechanical and Aerospace Engineering, Cornell University
- Dr. Sabine Fuss
  Head of Working Group on Sustainable Resource Management and Global Change, Mercator Research Institute on Global Commons and Climate Change
- Dr. Stephan Singer
  Senior Adviser, Climate Action Network (CAN) International
- Dr. Arunabha Ghosh
  Executive Director, Council on Energy, Environment and Water (CEEW)
- Mr. Janos Pasztor
  Executive Director, Carnegie Climate Geoengineering Governance Initiative (C2G2)
- Mr. Nicholas Harrison
  Senior Programme Manager, Carnegie Climate Geoengineering Governance Initiative (C2G2)

[2] http://web.unep.org/about/cpr/events/briefing

[3] http://web.unep.org/about/cpr/events/briefings-secretariat/carnegie-climate-geoengineering-governance-initiative-workshop

Welcome and Introduction

1. Mr. Janos Pasztor opened the workshop, welcoming participants and introducing the Carnegie Climate Geoengineering Governance Initiative (C2G2).

2. C2G2 is neither in support nor against Solar Geoengineering or Carbon Removal but is promoting discussion on their potential governance, by providing an impartial platform for views to be expressed and explored, to strengthen the knowledge base to inform government decision making.

Background and context: climate change

3. Mr. Wenjian Zhang, Assistant Secretary General, World Meteorological Organisation (WMO) provided background and context on climate change.

4. Improvements in meteorological data are showing us the increasing extent and impacts of climate change and global warming (e.g. model simulations indicate that hurricanes in a warmer climate are likely to become more intense).

What is Carbon Removal?

5. Dr. Sabine Fuss provided a (pre-recorded video) an overview of Carbon Removal and its role in achieving a 'well below 2°C pathway'.

6. Limiting global warming to 1.5°C above the pre-industrial average will make the world increasingly dependent on technologies that extract carbon dioxide from the atmosphere.

7. However, technology development and expansion (including pilot projects), are considerably lagging behind the timetable for deployment in current climate mitigation scenarios. In order to limit global temperature-rise to below 2°C, the extensive use of a broad portfolio of "negative emission technologies" (NETs) will be required.

8. There is a major gap in the dialogue between science and policy. With the Paris Agreement, the international community committed itself to limiting global warming to well below 2°C. However, the necessary deployment of NETs is currently hardly discussed in policy debates, although some of these technologies present considerable conflicts over land use, water consumption or energy requirements among others.

9. NETs aim to remove carbon dioxide (CO_2) - the major driver of anthropogenic climate change - from the atmosphere. They include relatively simple options like planting more trees to lock up CO_2 as they grow or crushing rocks that naturally absorb CO2 and spreading them on soils so that they remove CO_2 more rapidly. Other options include sequestering CO_2 directly from the air (Direct Air Capture) or burning plants for energy and capturing the CO_2 that would otherwise be released, then storing it permanently deep below the ground. This is called Bioenergy with Carbon Capture and Storage (BECCS).

10. All NETs have different costs attached to them, but one has to consider all the options and it is important to note that Carbon Removal is not a substitute for emission reductions.

What is Solar Geoengineering?

11. Prof. Douglas MacMartin provided an overview of Solar Geoengineering and what role it might play in an overall climate strategy.

12. Solar Geoengineering aims to address some of the impacts of global warming by helping cool the planet through increasing the release of heat or reflecting sunlight away to reduce further warming.

13. One option involves the injection of aerosols into the stratosphere (Stratospheric Aerosol Injection) which could theoretically be deployed with specially adapted aircraft.

14. Other options include Marine Cloud Brightening, which would involve a fleet of wind-powered ships spraying salt-water into low-level clouds to increasing their ability to reflect sunlight back out to space. However, cloud-aerosol interactions are poorly understood.

15. A limited deployment of Solar Geoengineering in addition to aggressive carbon dioxide emission reductions might reduce many climate risks and avoid tipping points.

16. There will be both physical climate risks and societal risks associated with Solar Geoengineering.

17. We do not know enough today to make an informed decision about what impacts deploying such technology might have. Around 20 years of research is still needed and even then, there will always be uncertainty. Such decisions Twill always be a risk-risk trade-off.

Civil Society considerations on governance

18. Dr. Stephan Singer provided a civil society view on deep decarbonisation and geoengineering.

19. There are currently many Carbon Removal technologies available, but CO_2 removal only makes sense if governments first focus on deep decarbonisation.

20. Carbon Removal should not have any negative effects on food security and biodiversity.

21. Before we engage in any carbon removal activities there should a broad public participatory debate.

Interactive game: A game on technology, science and governance

22. Mr. Nicholas Harrison introduced and facilitated an interactive game, engaging workshop participants in a fun exploration of the complexity of decisions balancing development with managing climate risk (using giant foam dice)[4]. In its final rounds, the game introduced the potential to deploy Solar Geoengineering to stimulate a group discussion of possible pros- and cons- and the need for governance.

23. The game illustrated the importance of strategic thinking to prepare for extreme climate events and clearly showed how future deployment of Solar Geoengineering may become increasingly tempting to manage the impacts extreme weather phenomena.

24. Workshop participants were divided into two teams (of 10 in each) and played three rounds ("decades") of the game with teams making investment decisions in the context of increasingly uncertain climate risk. By decade four, when offered the opportunity to deploy Solar Geoengineering to improve their chances of winning more development points (the team with most points at the end, wins), one team decided to deploy and the other not to. Interestingly, the team which decided to deploy were behind on development points and when reflecting on the reason for deploying stated "well, we had nothing to lose so we thought we should just go for it!". The other team (who had more development points) said the opposite: "we didn't want to deploy and put at risk our points lead" – could this be an analogue for future international governance or deployment debates between global South and North? Time will tell.

Considerations for governance

25. Dr. Arunabha Ghosh provided an overview of considerations for the governance of Solar Geoengineering and Carbon Removal.

26. Material concerns regarding the governance of Carbon Removal and Solar Geoengineering centre on risk, whereas ethical concerns centre on intentions, however governance does not necessarily mean prohibition.

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[4] C2G2 gratefully acknowledges Pablo Saurez and colleagues at the Red Cross Red Crescent Climate Centre for creating the game.

27. We cannot analyse the different technologies in silos and governance should guide the research community.

How to get the governance we need

28. Mr. Janos Pasztor presented an overview of the current state of international governance of Solar Geoengineering and Carbon Removal noting some potential routes to future governance arrangements.

29. UNEA-4 could consider passing an initial resolution to recognize the gaps in, and suggest ways to address governance of these technologies. Such a resolution could inform an eventual UN General Assembly resolution in 2022 on the governance of geoengineering, including an element to agree on not deploying Solar Geoengineering unless the risks and benefits are sufficiently known, and the governance can be agreed.

30. It is crucial to engage developing countries in the discussion about Carbon Removal and Solar Geoengineering.

Discussion

31. One participant noted that it is not realistic to hope for a resolution on Geoengineering at UNEA-4, since Member States will not yet be able to define their positions. UNEA-4 should instead take a decision to give UN Environment a coordinating role to provide Member States with impartial knowledge to inform their positions (e.g. assessment of options).

32. It was noted that UN Environment may have an important role to play in connecting scientists and policy-makers and promoting tools such as a Code of Conduct for research.

33. Concerns were shared that too often Developing countries are engaged in discussions on international governance of new issues at such a late stage that they really cannot have a meaningful input, they have already ‘missed the bus’. However, following further discussion, it was noted that this issue is different as the technologies and discussions around their governance are still at such an early stage that broad involvement and influence in research and development is still possible.

34. Concerns were also shared that investment in research and development of geoengineering might be used by industrialized countries to offset their financial obligations to address climate change.

35. Concerns were shared about the potential involvement of vested commercial interests in the governance discussion and this is why it is important to have key discussions now before more influential political forces join the debate.

36. It was noted that governance of Geoengineering is an important part of broader global efforts to identify and address global environmental challenges.

37. Carbon Removal and Solar Geoengineering is a technically complicated and controversial issue and many technologies are still at an early stage of development.

38. Most participants seemed to have a rather negative view (“We should not interfere with nature”), however, views differed and some representatives were open to explore the use of geoengineering especially in view of the scientific evidence that Carbon Removal will be necessary in order to fulfil climate targets.

39. Many participants agreed on the importance to learn more about the technologies and engage in more serious discussion of governance options at the international level.

Registered participants

- Allen Ottaro, Catholic Youth Network for Environmental Sustainability in Africa
- Anzul Jhan, UN Habitat
- Arunabha Ghosh, Council on Energy, Environment and Water (CEEW)**
- Chrispinus Wanyonyi Maina, Agency for Science Technology and Communication, Kenya
- Chrispin Otin, Agency for Science Technology and Communication, Kenya
- Churchill Osugo, Tumaini Letu Africa
- Cicilia Githaiga
- David Ngigi Munene, Catholic Youth Network for Environmental Sustainability in Africa
- Douglas MacMartin (Cornell University and California Institute of Technology)**
- Evelyn Ng'ang'a
- Francis Nyagaka
- Hellen Wangechi Mugo, Catholic Youth Network for Environmental Sustainability in Africa
- Jana Gheuens, Belgian Embassy
- Janos Pasztor, Carnegie Climate Geoengineering Governance Initiative (C2G2)**
- Jared Akama Onyari, Kenya Environment and Waste Management Association
- Josphat Lumwagi, Forestry, Agriculture, Livestock Improvement and Soil Conservation Programme (FALIASCOP)
- Juliet Makokha, Sustainable Environment and Development Watch (SUSWATCH) Kenya
- Kai-Uwe Schmidt, Carnegie Climate Geoengineering Governance Initiative (C2G2)
- Laban Ogallo, University of Nairobi
- Nabila Ghazli, Embassy of Algeria
- Nicholas Harrison, Carnegie Climate Geoengineering Governance Initiative (C2G2)**
- Ambassador Raza Bashir Tarar, Pakistan High Commission
- Stephan Singer, Climate Action Network (CAN) International**
- Wenjian Zhang, World Meteorological Organisation (WMO)**

** *Speakers*

Disclaimer

This report has been prepared based on notes taken during the workshop and has endeavoured to faithfully and accurately document points raised during the workshop. All discussions were convened under Chatham House rules and any views expressed do not reflect official positions of C2G2, the UN Environment Programme nor those of workshop speakers or participants. Please notify Nicholas Harrison njharrison@c2g2.net of any important corrections required.