Australian Government
Chief Scientist

MEETING BRIEF

Meeting: International Chief Science Advisors
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Location: WEBEX

Date and time: Wednesday 18 December 07.30 – 08.30 AM

OCS staff attending: Paula Perrett

Context

The UK is hosting this meeting between international Chief Science Advisors. The last meeting was on 28 September 2024.
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Agenda

1. s 22(1)(a)(ii)
2. If time, a discussion on what topics are on CSAs' minds and bothering them at the moment
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Other topics front of mind

5. Geoengineering

   Australia is undertaking modelling and atmospheric research and trials. How much of a priority is geoengineering research for other countries?

   [See background notes on geoengineering on page Research notes in preparation for the meeting of the s 22(1)(a)(ii) , 18 December 20244]

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Background: Geoengineering

Research notes in preparation for the s 22(1)(a)(ii) , 18 December 2024

Purpose

This research note provides an overview of Australian research on geoengineering. It was compiled through desktop research only.[1]

Definitions

Geoengineering is an umbrella term to describe actions to 'alter the climate system to counter climate change' (IPCC, 2013, 19).

This includes:

- direct carbon removal, such as carbon capture and storage, afforestation etc.
- solar radiation management, otherwise known as 'solar geoengineering', e.g.
    - cloud brightening
    - cirrus cloud thinning
    - stratospheric aerosol injection.

Direct carbon removal is well established.

Solar geoengineering is highly controversial due to concerns about:

- the possibility it will deter climate action
- potential concentration of power among those who control it
- unintended consequences
- difficulties of regulation.

Solar geoengineering is not being implemented at scale, although it is the subject of considerable debate. As the effects of climate change worsen, demands for solar geoengineering may increase.

Solar geoengineering research in Australia

Research in Australia about solar geoengineering can be categorised into 3 types:

1. Atmospheric research and trials

The Reef Restoration and Adaptation Program (RRAP) (funded through the Australian Government's Reef Trust and the Great Barrier Reef Foundation) is researching options for cooling and shading on the Great Barrier Reef.[i]

This includes cloud and sky brightening which involves dispersion of nanosized sea-salt aerosols into the atmosphere to be incorporated into clouds. Trials took place in the early 2020s. Research is led by:

- Southern Cross University
- CSIRO
- QUT and other contributors.

The Australian trials are a rare example of outdoor solar engineering experimentation.

Other trials being conducted as part of this program include small-scale shading of coral using shade cloth.[ii]

[1] Much of the content in these notes was drawn from: Symons, J., Fung, C., Jayaram, D., Kabbej, S., & McDonald, M. (2024). Australia, we need to talk about solar geoengineering. Australian Journal of International Affairs, 78(3), 369–374. https://doi.org/10.1080/10357718.2024.2333811

Other atmospheric research undertaken in Australia includes research into the atmospheric aerosols that may inform future solar geoengineering attempts.

Centres for atmospheric research in Australia include:

- University of Wollongong Centre for Atmospheric Chemistry
- CSIRO Climate Science Centre (Atmospheric Composition and Chemistry group)
- University of Melbourne Atmospheric Chemistry and Composition group

2. Modelling

As solar engineering is very controversial, opportunities for field trials are limited and most research focusses on modelling.

Australia contributes to GeoMIP, an international collaboration to model solar geoengineering scenarios.

GeoMIP is led by researchers from Rutgers and Cornell Universities in the US and receives funding from the NSF. The UK and Canada also participate.

Australia's contribution has been via the CSIRO and its Mk3L climate system model (note: this model is now quite old and Australia's current engagement with GeoMIP is not clear).

3. Politics, governance and regulation

The University of Tasmania hosts the Australian Forum for Climate Intervention Governance, which 'aims to be the leading research centre for climate intervention governance in the Southern Hemisphere'.

It includes members from CSIRO, the University of Newcastle and Melbourne University.

Recents activity

US – The Office of Science and Technology Policy: Congressionally mandated research plan and an initial research governance framework related to solar radiation modification (June 2023)

UK – The National Environment Research Council (NERC) has allocated £10.5 million for a 5-year Modelling Environmental Responses to Solar Radiation Management programme

Canada – 'improving the understanding of climate-altering technologies in the Canadian context' (e.g. solar radiation modification) is highlighted as an area of essential research in Environment and Climate Change Canada's Science Strategy 2024-2029.

Australia's international engagement in solar geoengineering

Australia has not played a significant role in international debates about geoengineering.

[i] https://gbrrestoration.org/program/cooling-and-shading/
[ii] https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2024.1333806/full

Melbourne roundtable 5 April 9am

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- Geoengineering tech (carbon sequestration, solar radiation management) for mitigating climate change – understanding the risks
  - Management frameworks and governance
  - Public trust
  - Intervention in complex natural systems
  - Substitute for addressing the root cause

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