



GEOENGINEERING AND THE CLIMATE CRISIS

Discussion guide for the proposed HOPE Inc.
(Australia) research series

*Technological Promise, Environmental Risk
and Global Responsibility*

Meeting date: Tuesday 20 October 2026

Time: 7pm – 9pm

Guest presenter – Dr Adrian McCallum,
University of Sunshine Coast

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A simple structure for the Zoom discussion.



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Introduction



Why this discussion, and what the proposed series is intended to do.

- Geoengineering is receiving greater attention as climate risks increase and emissions reductions remain insufficient to avoid dangerous warming.
- The proposal treats geoengineering as a broad family of very different interventions - not as a single technology or policy option.
- The proposed research is deliberately open-ended: it asks what works, what risks arise, who bears those risks, and under what conditions any intervention could be legitimate.
- Today's discussion: should HOPE Inc. (Australia) pursue this coordinated research series, and if so, how should it be structured and supported?

The proposal explicitly distinguishes carbon dioxide removal from solar radiation modification, weather modification from climate intervention, and research from climate-significant deployment.



Adrian McCallum

University of the Sunshine Coast

- Trained Oceanographer, Meteorologist and Glaciologist
- Teaches courses in Soil Mechanics & Weather and Climate
- Interested in facilitating discussion on Geoengineering value or not

Definition

A working definition for the discussion.



Geoengineering: a broad set of methods and technologies intended to deliberately alter the climate system in order to alleviate the impacts of climate change.

Carbon dioxide removal (CDR)

Removes CO₂ from the atmosphere and stores it in geological, terrestrial or ocean reservoirs, or in products. Examples include direct air capture, enhanced weathering and some nature-based approaches.

Solar radiation modification (SRM)

Intentionally changes the Earth's radiative balance to reduce warming. Proposed methods include stratospheric aerosol injection and marine cloud brightening.

Important: the proposal also separates geoengineering from ordinary weather modification and from emissions reduction itself.

Current global and Australian initiatives



Examples only - this is not a comprehensive inventory.

GLOBAL

UK - ARIA “Exploring Climate Cooling”

A £56.8m programme funding 22 research teams across modelling, laboratory work, governance and, where judged necessary, small controlled outdoor experiments.

International - UNEP / WMO dialogue

Ongoing science-policy work is examining SRM research gaps, risks, governance and how countries can participate in informed international discussion.

AUSTRALIA

Great Barrier Reef - marine cloud brightening

The Reef Restoration and Adaptation Program has documented field research on sea-spray aerosols, cloud interactions and the potential to reduce heat stress on reefs.

CSIRO - Australian CDR Roadmap

The 2025 roadmap assesses novel carbon-removal pathways including direct air capture and storage, biomass carbon removal and storage, ocean alkalinity enhancement, and enhanced rock weathering.

These examples are research, assessment and governance initiatives - not evidence of climate-scale deployment.

Sources: ARIA Exploring Climate Cooling; UNEPSRM science-policy materials; RRAP Marine Cloud Brightening Final Report 2025; CSIRO Australian Carbon Dioxide Removal Roadmap (2025).

HOPE Inc. (Australia) proposed research series



Papers 1-4: foundations, history, carbon removal and solar intervention.

1

Geoengineering: What Is It and Why Is It Being Considered?

Terminology, categories, climate context and the risk of mitigation deterrence.

2

A History of Weather Modification and Climate Intervention

Selected historical cases - what succeeded, what failed, and what governance lessons recur.

3

Removing Carbon from the Atmosphere

Effectiveness, permanence, scale, land/water/energy demands, ecological impacts and Australian relevance.

4

Solar Geoengineering: Rapid Cooling or Planetary Risk?

SRM options, potential benefits and risks, termination shock, reversibility and research-versus-deployment distinctions.

HOPE Inc. (Australia) proposed research series



Papers 5-6 plus an optional synthesis paper.

5

Geoengineering, Climate Justice and Human Responsibility

Who benefits, who bears risk, who decides, and how Indigenous rights, human rights and intergenerational responsibility should be considered.

6

Who Governs Geoengineering?

International law, unilateral action, research governance, liability, compensation and Australia's policy role.

7

Synthesis: Climate Solution, Supplement or New Global Threat?

Draw the six papers together, test the evidence, identify unresolved risks and consider governance principles and Australia's position.

Original proposal: six standalone research papers + an optional synthesis paper, with a shared glossary and common assessment questions.

Source: HOPE Inc. (Australia) proposal, pp. 8-14.

What's the next step for HOPE to pursue?

Discussion prompts rather than predetermined recommendations.

- 1 Confirm the model** Proceed with six papers + synthesis? Commission sequentially or in parallel?
- 2 Find research partners** Identify volunteer researchers, university partners and suitable expert advisers.
- 3 Agree the common frame** Use shared definitions, glossary, principles and assessment questions so the papers connect without becoming prescriptive.
- 4 Set review and publication** Decide who reviews drafts, how the series is published, and how public-facing summaries are prepared.
- 5 Keep the inquiry open** Any eventual HOPE Inc. (Australia) position should follow the evidence gathered across the series.

Useful outcome from this meeting: agree the first concrete action, who owns it, and a realistic timeframe.

Questions

Possible prompts for the discussion

Is the proposed six-paper + synthesis structure the right scope?

Where could university partners add the most value?

Which scientific, justice or governance questions need stronger emphasis?

What should HOPE Inc. (Australia) do first after this meeting?

Capture decisions, responsibilities and follow-up actions before closing.



Thank you

to our guest presenter

Adrian McCallum

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