

The C2G2 Approach—Summary¹

23 March 2018

The Challenge

Two years after the Paris Agreement on climate change, evidence is growing that without a rapid acceleration in action, limiting global average temperature rise to 1.5-2°C might not be achieved through emissions reductions alone. Scientists have begun exploring the additional use of carbon removal and solar geoengineering technologies to limit climate impacts, including keeping temperature rise down.

Carbon removal technologies would address the source of human-caused climate change by drawing out carbon dioxide from the atmosphere. Also known as greenhouse gas removal, or negative emissions technologies (NETs), their large-scale use this century is assumed in the vast majority of scenarios by the Intergovernmental Panel on Climate Change (IPCC) that kept global temperature rise within the range specified in the Paris Agreement.

Solar geoengineering technologies would address a symptom of climate change, by reflecting more solar radiation into space, thereby cooling the Earth. They are also known as solar radiation management or albedo modification technologies. So far, these have not been considered as part of international climate plans and are 15-20 years away from a properly researched and governed deployment. An outdoor experiment, however, is planned this year in the airspace above the US state of Arizona. The world needs guardrails in place before the science runs too far ahead of what society is willing to accept.

Limited, if any, comprehensive rules and guidelines exist at the national or international level to govern how geoengineering technologies might be tested or used, and policymakers have low levels of awareness about their risks and potential benefits.

Collectively known as ‘geoengineering’, these technologies are attracting increased attention by the media and the public as the challenge of meeting the Paris goals becomes ever more stark. The time has arrived for a broad global conversation about how geoengineering technologies should be governed before they are fully developed and potentially used.

C2G2's goals

The Carnegie Climate Geoengineering Governance Initiative (C2G2) aims to **catalyse the creation of effective governance** of solar geoengineering and carbon removal.

C2G2 is neither for nor against research on or deployment of geoengineering technologies. These are decisions for society to make. C2G2 provides an **impartial platform** for governmental, intergovernmental and non-state actor policymakers to discuss these difficult issues.

We **promote informed, prudent and inclusive decision-making** that weighs the risks and potential benefits of geoengineering against the threats posed by a warming world.

¹ For more details, please refer to the full document [“Our Approach”](#) on [c2g2.net](#)

Solar geoengineering in particular raises profound challenges. It is far from clear whether the international community, and society at large, will deem it acceptable to use, or if so, how it would manage its deployment and termination over decades, possibly hundreds of years. Effective governance can help to address society's concerns and guide critical research.

C2G2's Theory of Change

Effective governance involves many processes and communities coming together. The first step is to bring the geoengineering conversation to a much broader range of policymakers, at the global, national and sub-national levels. Once they appreciate the urgency, they can deliberate on what they need to know, gather a broad range of views from society, and discuss what governance structures may be needed. Once they have learned more, they will be in a better position to take sound decisions.

C2G2 will engage with governments, the UN, civil society, faith communities, academia, and the private sector in multiple national and international fora. It is building a coalition of national governments that will spearhead governance discussions in key multilateral processes, including the Convention on Biological Diversity (CBD), UN Environment Assembly (UNEA), the UN Framework Convention on Climate Change (UNFCCC) and the UN General Assembly (UNGA).

Through this engagement, C2G2 aims to catalyse a series of landmark decisions, resolutions, programmes, statements and other interventions that collectively create a multilateral, comprehensive approach to effective governance of geoengineering.



Figure 1: Catalysing the learning process

C2G2's Three Priorities

Priority One: Governance of Solar Geoengineering

C2G2 will catalyse international agreements to help prevent the deployment of solar geoengineering unless (i) the risks and potential benefits are sufficiently understood, and (ii) international governance frameworks are agreed.

C2G2 believes the absence of governance surrounding the potential deployment of solar geoengineering poses a critical risk to society. While likely some years away, C2G2 believes this low probability but potentially high consequence scenario should receive priority attention.

Any deployment of solar geoengineering would require **unprecedented governance structures** to address issues such as decision-making authority, inter-regional and inter-generational justice, security risks emanating from deployment, and the threat of premature termination, which could cause massive environmental consequences

Key actors are currently holding back from this essential discussion. To help overcome this reluctance, requires knowledgeable, credible champions who can share information and mobilize others, assume leadership of ideas, and develop the knowledge to design appropriate governance.

An international agreement stating there should be no deployment of solar geoengineering unless certain conditions are met can reduce the risks of hasty, unilateral and ungoverned deployment, while allowing and encouraging more research to inform decision-making.

C2G2 will catalyse a **leadership movement** committed to preventing ungoverned deployment. At the same time, it will work to, develop a better understanding of the risks and potential benefits of solar geoengineering and the frameworks required for its prudent, effective governance.

1. **Intergovernmental track:** C2G2 is working with representatives of UNEA, UNFCCC, CBD, the IPCC, and the Executive Office of the UN Secretary-General. C2G2 will also explore work with representatives of the UN Security Council, the G20 and G7, the Commonwealth, the Arctic Council, the Arctic Circle, the African Union, the European Commission, as well as other regional bodies.
2. **National governments track:** C2G2 will encourage 25 or so “key countries” to support our approach and governance priorities. C2G2 will seek “friends of geoengineering governance” groups in cities where relevant intergovernmental organizations have their headquarters.
3. **Non-state actors track:** C2G2 is working with civil society organizations, faith groups, think tanks, humanitarian organizations, and sub-national actors to build support for geoengineering governance. These can build bottom-up momentum to spur action.



Figure 2: A potential timeline towards multilateral governance of geoengineering

Priority Two: The Governance of Research

C2G2 will support the development of international governance of research, particularly for solar geoengineering.

Both carbon removal and solar geoengineering are in their infancy. Basic technologies exist for different carbon removal approaches, but none of them exist at scale. Solar geoengineering technologies exist only in computer models at this stage.

Well-governed research is necessary to address whether these technologies are feasible, and with what risks, costs and benefits to society. Public participation is important to promote accountability and ensure that research does not result in a ‘slippery slope’ leading to hasty deployment. Research and the evolution of governance need to occur in parallel. There is currently too much society doesn’t know.

C2G2 will focus on the **international dimensions** of research, calling for agreed norms, standards, and guidelines as well as consistent monitoring, reporting and verification. C2G2 will work with governments, multilateral entities and national and international research councils to develop frameworks. This includes research under the **CBD**, which in 2016 called for “more trans-

disciplinary research”, and the **UNFCCC** on a possible research framework for carbon removal. C2G2 also encourages the wider use of “codes of conduct” for geoengineering research.

Priority Three: Governance of Carbon Removal Technologies

C2G2 will encourage discussions about the governance of carbon removal technologies at the sub-national, national and global levels, including in particular at the UNFCCC

Very few policymakers are aware of, let alone have accepted, growing scientific evidence that the world must remove excess carbon dioxide in the atmosphere, as well as reduce emissions, in order to stay within internationally agreed temperature targets.

Yet removing greenhouse gases at the necessary scale entails significant governance challenges, which are only now becoming fully apparent. Governance of carbon removal technologies is essential to ensure public accountability, oversight and a transparent discussion of their benefits, risks, trans-boundary impacts and trade-offs, particularly on land-use issues and other linkages with other Sustainable Development Goals).

C2G2 will kick-start discussion amongst Parties to the UNFCCC and will leverage opportunities provided by the September 2018 Climate Action Summit, the release of the IPCC’s 1.5°C Special Report, the UNFCCC Talanoa Dialogue at COP24, and the CBD COP14, to advance the governance of carbon removal.

Flexibility and Unpredictability at Pivot Moments

The geoengineering conversation could at any moment suddenly pivot in a new direction. Potential pivot moments include the launch of an outdoor solar geoengineering experiment, or a climate tipping point that prompts a public outcry. Their outcomes will likely be complex and unpredictable. C2G2 is prepared to rapidly shift its plans to react to changing realities.

KEY MESSAGES FOR GOVERNMENTS AND CIVIL SOCIETY

1. **The time for leadership is now.** The governance of geoengineering must be addressed before large scale research and deployment begins. Early entrants to this discussion will play a defining leadership role, on a critical issue of global governance.
2. **We need to learn more.** The world does not know enough about the risks, unintended consequences and potential benefits of solar geoengineering. Well-governed research may help answer these questions and can help set the agenda on issues that matter to your community.
3. **It takes a village.** No one global institution can address all the dimensions of governance. Governance must be bottom-up as well as top-down, and span processes and institutions in interconnected ways. Civil society, faith communities, the private sector, young people and others must make their voices heard.

For more information, please visit c2g2.net or write to us via: contact@c2g2.net.