DRAFT CODE OF CONDUCT FOR RESPONSIBLE SCIENTIFIC RESEARCH INVOLVING GEOENGINEERING

Executive Summary

Introduction

The global community is bound together in its shared responsibility to address the causes and consequences of climate change. After years of discussions, the adoption of the Paris Agreement has brought renewed leadership and ambition to this area. However, in view of serious climate risks arising from existing greenhouse gas emissions and uncertainties surrounding the implementation of new commitments, the policy conversation is opening up to allow for the consideration of geoengineering as an additional compliment to conventional mitigation and adaptation. Categorised as either as greenhouse gas removal or radiation management, geoengineering is commonly defined as the large-scale modification of the planetary environment, primarily with the aim of counteracting climate change. Given the risks and ethical concerns surrounding geoengineering research, governance remains a primary concern in this field. Although some legal regimes have relevance to geoengineering, there are gaps in the existing legal and institutional framework that must be addressed.

Against this backdrop, this legal study aims to contribute to the development effective governance and regulatory arrangements for geoengineering, focusing on the near-term priority of scientific research conducted in the open environment. The current version of the text of this 'Code of Conduct for Responsible Scientific Research involving Geoengineering' is based on an incremental approach to the development of international law in response to environmental, socio-technical, ethical and other concerns raised by geoengineering. By formulating a concrete text for a geoengineering governance instrument, this project aims to highlight further research needs and elucidate pathways forward in this area. It aims to provide a States and other actors to draw upon when developing governance frameworks for geoengineering. This project is a collaborative effort that incorporates the insights of a wide range of disciplinary expertise in the field. The next phase of research seeks to open up a wider policy dialogue with various stakeholders including government, academics, experts, civil society and the broader public and incorporate their insights to further refine the text.

The following is a summary of the draft articles of the 'Code of Conduct for Responsible Scientific Research involving Geoengineering' as they currently stand. The text is based on a working paper co-authored by Anna-Maria Hubert and David Reichwein and published jointly in 2015 by Institute of Advanced Sustainability Studies, Potsdam (IASS) and Institute of Science, Innovation and Society (InSIS) at the University of Oxford:

http://www.insis.ox.ac.uk/occasional-papers/a-code-of-conduct-for-geoengineering-research/

Draft Article 1 – Nature and Scope

The Code is devised as a voluntary instrument that draws upon existing rules and principles of international law. It anticipates a shared role for State and non-State actors in the creation and shaping of geoengineering governance globally. It primarily addresses scientific research on geoengineering conducted in the open environment, but also has wider relevance to general policy, legal and institutional developments in this area.

Draft Article 2 – Objectives

The Code aims to provide guidance to promote the responsible conduct of scientific research on geoengineering. It also stands as a reference for governments in crafting legal and institutional frameworks on geoengineering research and the harmonisation of these rules across jurisdictions. It further seeks to contribute to international cooperation on geoengineering research. In addition, the Code engages with non-State actors by providing a standard of conduct for researchers and others involved in geoengineering assessment and analysis.

Draft Article 3 – Relationship with International Law

The Code is intended to work alongside international law, without prejudice to the existing rights, jurisdictions and duties of States.

Draft Article 4 – Definitions

Defining geoengineering – the very subject matter for regulation – is a challenging endeavour that must encompass a variety of concerns and inter-disciplinary considerations. In light of the changing nature of the field, the Code takes a flexible perspective on defining geoengineering. It proposes an expressly broad definition of geoengineering for governance and regulatory purposes with a view to capturing most possible iterations of geoengineering proposals at this early stage. Geoengineering is defined as large-scale, deliberate measures aimed at substantially modifying the climate and scientific research related to this goal. Such strategies are further classified as either greenhouse gas removal or radiation management. The former are aimed at removing greenhouse gases from the atmosphere and the latter at reducing the amount of solar radiation retained by the Earth to induce a cooling effect.

Draft Article 5 – General Principles

Draft Article 5 examines geoengineering within the context of international environmental law and principles of sustainable development. In particular, given that geoengineering mainly targets climate change, it provides guidance in light of the 'constitutional framework' laid down in the UNFCCC and its evolution – most recently with the adoption of the Paris Agreement.

Specifically, draft Article 5 incorporates the legal concept of the 'common concern of humankind' – recognizing the collective interests and responsibilities of all States in the protection of the atmosphere globally, both within and outside of areas of national jurisdiction. Though it does not directly create new positive obligations, 'common concern' does provide an underlying rationale for progressive development of the law in areas touching upon climate change and encourages States to cooperate to address these challenges. In particular, common

concern may undergird the notion that all States may have a shared interest in understanding the efficacy, benefits and risks of different geoengineering measures and in the development of governance and regulation of research and technological developments in this field.

The Code admonishes stakeholders to not promote or use geoengineering as a substitute for measures which anticipate, prevent or minimise the causes of climate change, in accordance with international commitments to rapidly reduce greenhouse gas emissions. This principle addresses concerns of a moral hazard, which suggests geoengineering may hinder greenhouse gas mitigation and adaptation policies. By promoting responsible scientific research, draft Article 5 attempts to balance the need to develop scientific knowledge on geoengineering without distracting from the development of an ambitious international response to reduce greenhouse gas emissions as the cause of climate change.

Equitable principles of inter- and intragenerational equity also apply. Specifically, the Code addresses aspects of burden-sharing in light of imbalance in both the root causes and capabilities of different countries in combatting climate change. It requires developed States to give full consideration to the needs of developing States when undertaking scientific research of geoengineering. In particular, it advocates that governance of geoengineering research is an open, participatory process that fosters cooperation and does not widen the knowledge gap between researching and non-researching States.

Finally, draft Article 5 incorporates the central principle all actors should ensure that scientific research involving geoengineering is conducted in a responsible manner in accordance with international law and taking into account the guidance provided in these draft Articles.

Draft Article 6 – International Cooperation

Cooperation is a central pillar of the architecture of the Code. Draft Article 6 broadly calls on States and others to cooperate in good faith in all aspects of geoengineering governance, specifically in the near-term so that scientific research into geoengineering is conducted responsibly and in accordance with established rules and guidelines. To this end, the Code outlines specific modes of cooperation necessary in the geoengineering context. Draft Article 6 recommends that States cooperate in the development of rules and principles for the governance and regulation of geoengineering research using the best scientific information available. The Code also recommends transparency and access to information as another important aspect to be factored into geoengineering governance. Cooperation should also extend to the full, open and prompt exchange of scientific, technological, and other information related to geoengineering. Given the controversial nature of geoengineering, draft Article 6 deviates from most multilateral environmental treaties, however, in its refusal to create a positive obligation to promote scientific research into geoengineering. It merely recommends that States and other actors that do chose to undertake geoengineering research cooperate and coordinate their efforts. Finally, the Code recognizes there is a need to govern legal responsibility and redress for those who may suffer consequences arising from geoengineering, and on this basis recommends the development of a specific international liability and compensation regime.

Draft Article 7 – Preventive Principle

Prevention of environmental harm is the driving force of the Code. Draft Article 7 integrates the customary law obligation of States to avoid environmental damage beyond their jurisdiction, balanced against their sovereign right to exploit their own resources. This obligation applies both to preventing damage to other States and to the global commons. By incorporating this principle into the Code, States will be required to take all appropriate measures to anticipate, prevent, or minimise significant adverse effects from scientific geoengineering research. However, States are not legally responsible where harm is unforeseeable or insignificant, or where the State acted with due diligence to minimize the risk. The due diligence requirement encompasses an evolving standard of care: States have a continuing obligation to prevent harm and to maintain knowledge on recent scientific and technical developments.

Draft Article 8 – Precautionary Principle

Recognising that many risks related to emerging technologies cannot be adequately quantified and known, the Code adopts a precautionary approach to geoengineering research. Draft Article 8 requires States act to anticipate, prevent, or minimise risk where there is a reasonably foreseeable threat of serious or irreversible damage, even in the absence of conclusive scientific proof of the damage.

Draft Article 9 – Use of Geoengineering

Draft Article 9 reaffirms what is commonly referred to as the *de facto* moratorium on geoengineering deployment established in non-binding decision X/33 of the Convention on Biological Diversity. In keeping with this decision, it carves out an exception for the purposes of scientific research on geoengineering that is conducted in accordance with international law and the guidance in the Code. This recommendation advocates that States refrain from causing, encouraging or carrying out the use of geoengineering. Accordingly, the *de facto* moratorium on deployment should be lifted only if there is a sound scientific basis to justify deployment of geoengineering strategies, appropriate consideration of environmental risks and other concerns, and the deployment takes place in accordance with the general agreement of States and the relevant rules of international law.

Draft Article 10 – Scientific Research involving Geoengineering

The literature on geoengineering reflects an inherent tension between the need to gain new knowledge about geoengineering methods in view of the serious and potentially irreversible risks posed by climate change and the prevention of environmental harm from the conduct of geoengineering research. Draft Article 10 attempts to balance these interests by suggesting specific principles for the conduct of scientific research involving geoengineering. At its core, draft Article 10 underscores that States and other actors should ensure, as far as practicable, that adverse effects of geoengineering research are avoided or minimised and the scientific benefits maximised. In addition, it suggests that the only potentially damaging activities carried out in the open environment should be those necessary for gathering specific scientific information. Recommending a prudent step-by-step approach, States must reassess the risks and knowledge associated with projects at each stage. The nature, scale, duration and intensity of the research activities conducted in the open environment should be proportionate to the current state of

scientific knowledge about the adverse effects of that activity, taking into account the precautionary principle. Draft Article 10 also contains other suggestions for ensuring scientific research causes as little environmental harm as possible. These include: using best scientific practices, ensuring scientific cooperation, comparing the potential impacts of geoengineering with the impacts from natural processes, maximising the information gained from perturbative research to avoid redundant experimental work, and making the granting of funds, ship and other resources contingent upon compliance with the Code.

Draft Article 11 – General Principles for the Assessment of Scientific Research involving Geoengineering

Most assessments of an appropriate governance architecture for geoengineering research include a role for the independent assessment of environmental effects. Draft Article 11 outlines general principles for environmental assessment that are further elaborated in subsequent provisions in the Code. This provision aims to ensure that assessment processes are designed to address the specific risks and concerns associated with geoengineering research activities. As a legal baseline, the Code reaffirms the obligation under customary international law to carry out an environmental impact assessment (EIA) where the proposed activity may have a significant adverse effect on the environment in a transboundary context, or on areas beyond national jurisdiction. As a fundamentally national instrument, EIA is also entrenched in the domestic law of a large number of states. In addressing the need for mechanisms that can apply to all scales and types of geoengineering, Draft Article 11 proposes an adaptive, flexible assessment process that continues throughout the life of a project by integrating information from prior assessments, post-project monitoring and public perspectives. The Code recommends a two-tiered impact assessment procedure where the likely environmental impact of a research activity accords with the comprehensiveness of the EIA requirements. Maintaining proportionality between the degree of detailed information used in assessing risk and the potential adverse environmental effects is paramount in balancing the interests of environmental protection and allowing for research to proceed without undue regulatory and administrative impediments.

Draft Article 12 – Assessment for Proper Scientific Attributes

The Code contains mechanisms to ensure proposed geoengineering research activities have 'proper scientific attributes'. This allows legitimate scientific research to be conducted while avoiding the deployment of geoengineering measures. One such mechanism included in the Code is the dissemination of research proposals to the broader scientific community to facilitate independent peer review and promote scientific scrutiny.

Draft Article 13 – Initial Environmental Assessment

The main innovation in this provision proposes to lower the threshold that triggers an EIA by recommending that all scientific research conducted in the open environment undergo a prior assessment. This promotes the function of EIA beyond the identification and management of risk into a mechanism for promoting good governance, sustainability and transparency. However, in order to alleviate some of the administrative burden on scientists, the Code recommends a two-tiered approach to the environmental assessment of scientific research on geoengineering, where the likely environmental impact of a research activity accords with the comprehensiveness of the

EIA requirements. Draft Article 13 sets out the minimum information required for assessing geoengineering research. If the initial environmental assessment indicates that the proposed research activity will have more than a *de minimis* adverse effect, a second, more comprehensive assessment is required.

Draft Article 14 – Comprehensive Environmental Assessment

Under a comprehensive environmental assessment, the relevant actors must provide additional detailed information about their project and identify any gaps or uncertainties that exist. Once this comprehensive information gathering has been completed, the Code requires States to assess this information both in light of other provisions in the Code and international law obligations.

Draft Article 15 – Public Participation

Draft Article 15 calls for public participation while recognising the challenges inherent in the existing participatory model. Nonetheless, it incorporates the basic requirements adopted in the Principle 10 of the Rio Declaration and the Aarhus Convention, including access to information, public participation in decision-making, and consultation with those who may be adversely affected.

Draft Article 16 – Authorisation of Scientific Research involving Geoengineering

Draft Article 16 articulates principles for authorising scientific research involving geoengineering. Approvals should only be granted where all steps of the assessment procedure have been met, and where the approval process is clear, efficient, and transparent. The Code also recommends that, before authorising a project, authorities should provide information to and ascertain the views of the public affected by a proposed research activity involving geoengineering.

Draft Article 17 – Post-Project Monitoring

The Code recommends post-project monitoring to the extent practicable for all geoengineering research projects. In light of the potential uncertainties surrounding perturbative experiments, post-project monitoring could play an important role in the ongoing assessment and management of geoengineering research by enhancing learning. Although the Code largely leaves the mechanics of post-project monitoring to the relevant authorities, it recommends monitoring of environmental indicators and baselines, review of effectiveness of mitigation measures, and revisiting past predictions to inform future assessments, monitoring requirements and decisions on authorisation.

Draft Article 18 – Availability of Information

Draft Article 18 expands on the idea of information sharing and transparency. It mandates that geoengineering stakeholders promote scientific and technical cooperation, in particular, by ensuring timely, complete and reliable reporting and access to all results, data and other information related to research conducted on geoengineering. This widens the customary obligation States have to share information when there is a risk of significant transboundary harm to the environment. As most geoengineering research will likely not reach this threshold, at

least in the near-term, draft Article 18 expands the conditions under which information exchange is necessary and provides a non-exhaustive list of information to be disclosed. This recommendation is also extends to non-State actors, and in particular members of the scientific community. Moreover, the Code goes beyond simply calling for the cooperation in information exchange by advocating for the creation of a mechanism in which States can share geoengineering related data.

Draft Article 19 – Implementation

Draft Article 19 provides direction on how to best implement the Code over time. By using the objective of sustainable development as its foundation and calling upon the cooperation of all interested stakeholders as geoengineering continues to evolve, the Code calls for a flexible and adaptive approach to its implementation.

This document has been prepared in connection with an interdisciplinary study on potential arrangements for the governance and regulation of geoengineering research. It is a joint initiative of the University of Calgary in collaboration with the University of Oxford and Institute of Advanced Sustainability Studies, Potsdam (IASS), funded by the V. Kann Rasmussen Foundation. Thank you to Stephen Armstrong, Kristin Barham, Miranda Böttcher, and Mackenzie Krochak for their assistance in preparing this Executive Summary.