

Regulating Solar Radiation Management in the EU

Introduction

Climate engineering (CE) or geoengineering is ‘the deliberate large-scale manipulation of the planetary environment to counteract anthropogenic climate change.’¹ Solar Radiation Management (SRM) is one such form of CE which aims to reduce global warming by reflecting sunlight reaching the stratosphere into space. Since SRM research is still at a nascent stage, difficulties arise as to its governance which do not necessarily stem from scientific or technical issues, but also from social, ethical, legal, and political ones.² While the literature has focused on the governance of SRM in general³, it is only recently that the role of the European Union (EU) in the regulation of SRM has been coherently explored.⁴

The EU’s technocratic regulatory framework separates the assessment of risk from the management of risk, both institutionally and procedurally. This paper will firstly consider how the EU’s risk regulatory framework can be adapted to SRM research by drawing on its current approach to GMOs (II). Even if the clear-cut division in the risk analysis approach of the EU between science and politics may be effective for SRM research, it is contended that it nevertheless locks the risk regulatory framework into a rigid, isolated one. As such, an ‘incorporated’ approach to SRM regulation in

¹ The Royal Society (2009) *Geoengineering the Climate: Science, Governance and Uncertainty*, at p.11

² *Ibid*

³ See Solar Radiation Management Governance Initiative (2011) *Solar Radiation Management: The Governance of Research*; Macnaghten, Phil, and Bronislaw Szerszynski, ‘Living the global social experiment: an analysis of public discourse on solar radiation management and its implications for governance,’ *Global Environmental Change* 23.2 (2013): 465-474; US National Research Council (2015) *Climate intervention: Reflecting sunlight to cool earth*

⁴ See European Journal of Risk Regulation, ‘The Special Issue on Regulating Climate Engineering in the European Union,’ 7:1 (2016), 58-119

which science and politics are simultaneously administered at the risk assessment stage is needed **(III)**. The incorporated approach also calls for the adoption of a deliberative system deriving from Responsible Research and Innovation (RRI) to include public participation which will be more responsible in legitimising the whole regulation of SRM research **(IV)**.

I. Regulating SRM research through the EU's risk analysis approach

The EU's risk analysis approach can be described as an inherently technocratic exercise. It is a three-tiered approach consisting of the assessment of risk which is science-based, the management of risk which is policy-based, and the communication of risk which is the exchange of opinions and information on risk. This procedural separation is institutional also: an independent scientific body is set up to assess risk on a case-by-case basis and the political bodies of the EU then decide on how manage that risk. This approach has been borrowed from the 1983 study in the US which sought for the 'institutional mechanisms that best foster a constructive partnership between science and government [...]'⁵ However, it is the *Meroni* doctrine which has further fixed this divorce between science and politics at a normative and institutional level.⁶ *Meroni* does not allow any discretionary powers being delegated to non-political bodies so that the institutional balance of powers in the EU is not undermined. Independent advisory bodies are only able to assess risk and communicate the findings to the relevant political institutions, onto which rests the

⁵ National Research Council Staff, (1900) *Risk assessment in the federal government: managing the process*. National Academies Press

⁶ *Meroni & Co., Industrie Metallurgiche, SpA v High Authority of the European Coal and Steel Community*. Case 9-56 [1957/1958]

ultimate decision on how the risk is to be managed.⁷ This approach can be exemplified through the risk analysis approach to GMOs.

GMOs are regulated by secondary legislation in the EU, of which the two most important pieces are the Deliberate Release Directive⁸ and the Contained Use Directive.⁹ In the interests of human health and environmental protections, no GMOs can be cultivated if the interested party has not received prior authorisation from the EU. The Contained Use Directive pertains to laboratory research on GMOs with full discretion accorded to Member States on how to implement the measures domestically. However, part C of the Deliberate Release Directive on the marketing of biotech crops provides little discretion to Member States as to implementing the rules. Further, part B of the Deliberate Release Directive on the experimental release of biotechnological food or crop provides Member States with some discretion as to the implementation while the EU also retains some powers on how these should be implemented. It is worth noting that Member States will have broader discretionary powers if the likelihood of transboundary harm is low and vice versa.

The point about transboundary harm is important because SRM research may have unknown irreversible consequences which go well beyond the boundaries of a Member State. The EU's risk analysis approach will certainly be effective to regulate certain SRM research with potential transboundary and also non-transboundary effects. As such, the assessment of risk with potential transboundary harm will

⁷ See Chamon, Merijn. 'EU Agencies: does the Meroni doctrine make sense,' *Maastricht Journal of European & Comparative Law*, 17 (2010): 281

⁸ Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms

⁹ Directive 2009/41/EC (recasting Directive 90/219/EEC) on the contained use of genetically modified micro-organisms (GMMs)

necessarily be at the sole discretion of the EU when SRM field research is conducted, similar to Part B of the Deliberate Release Directive on GMOs. In the same vein, SRM laboratory or field research will be left at the discretion of Member States if the harm is non-transboundary. Following the risk analysis approach of the EU, an independent scientific advisory body – analogous to the European Food Safety Authority which conducts case-by-case risk assessment on GMO-related products-, would be set up to assess risks pertaining to SRM field research. However, while the transboundary nature of SRM research may be probed by scientific assessment alone, it nevertheless presents legitimacy issues as to the lack of policy input at the risk assessment stage.

II. Reconciling science and politics to regulate SRM?

Uncertainty lies at the core of risk regulation. Risk regulation does not aspire to the elimination of risk but substituting acceptable for unacceptable risk.¹⁰ However, one of the major challenges for the legal regulation of SRM turns on the possible effects of which we are not even aware can occur after some SRM field research has been conducted. This can be termed as ‘trans-scientific issues’ which are ‘questions of fact that can be stated in the language of science but are, in principle or in practice, unanswerable by science.’¹¹ Also denominated as ‘significant scientific uncertainty,’¹² these trans-scientific issues present difficulties for governance when the science is not legitimate enough to make the decision on how uncertain risks should be regulated. If

¹⁰ Heyvaert, Veerle ‘Governing climate change: towards a new paradigm for risk regulation’ *The Modern Law Review* 74.6 (2011) 817-844. at p.820

¹¹ Majone, Giandomenico ‘Foundations of risk regulation: Science, decision-making, policy learning and institutional reform,’ *European Journal of Risk Regulation* 1 (2010): 5

¹² Sargoni, Janine ‘Best of Both Worlds: Maximising the Legitimacy of the EU’s Regulation of Geoengineering Research,’ *European Journal of Risk Regulation* 7.1 (2016) 87-108, at p.89

the science is significantly uncertain, as is usually the case with SRM field research, a purely scientific assessment of risk which does not take politics into account at the risk assessment stage will be irresponsible in the sense that risk is not ascertained by both scientific and political expertise. Politics only come into play at the management stage.

The institutional separation of risk assessment and risk management thus creates a regulatory lock in which the EU safeguards its balance of powers by leaving the discretionary powers to the political institutions only, as per the *Meroni* doctrine. Having said that, since the risk assessment stage only involves science, it locks the EU's risk analysis approach into an 'isolated' risk assessment process.¹³ This regulatory lock is appropriate where there is significant scientific certainty but is equally inappropriate when the science is too uncertain because 'assessments on scientific information alone are likely to be meaningless.'¹⁴ Indeed, if scientists themselves cannot predict what kind of effects SRM field research may provoke, it seems necessary that policy-driven views be included outright at the assessment stage itself.

The *Meroni* doctrine, however, locks the EU's risk analysis process into a rigid framework which cannot be adjusted to accommodate other types of risk analysis when the science is not certain enough. Indeed, the 'institutional separation of risk assessment and risk management is counterproductive, because while the two functions are conceptually distinct, in practice they are closely intertwined.'¹⁵ This

¹³ *Ibid*

¹⁴ *Ibid*, at p.101

¹⁵ Majone 2010, at p.18

intertwining of science and politics is especially salient in the face of significant scientific uncertainty. As such, an ‘incorporated’ approach at the risk assessment stage which involves science and politics simultaneously would legitimise the whole risk analysis process, in which legal decision-making would be orchestrated by an institution imbued with democratic credentials. Nonetheless, the legitimate process through the ‘incorporated’ approach also demands that the public play an impactful role within a framework steeped in RRI.

III. Public participation and RRI: towards a mixed technocratic-deliberative regulatory approach to SRM

The role of public participation in the regulation of geoengineering is one of the challenges to global governance.¹⁶ As technology such as SRM becomes increasingly prominent in the life of lay persons, they ‘should have a democratic right to influence its development.’¹⁷ An engaged deliberative participation of the public in the regulation of SRM research is likely to uphold a democratically legitimate process. Wherever issues requiring decision-making which are too complex for science and politics to ascertain, public opinions input can help deal with the societal and ethical concerns that SRM research may generate. Public participation is one of the five Oxford Principles which calls for the prior informed consent of those affected by the research activities.¹⁸ ‘In a democratic society, ultimately only its citizenry can

¹⁶ Dalby, Simon, ‘Geoengineering: The Next Era of Geopolitics?’, *Geography Compass* 9(4)1 (2015): 8

¹⁷ Andersen, Ida-Elisabeth and Birgit Jæger, ‘Scenario Workshops and Consensus Conferences: Towards More Democratic Decision-Making’, *Science and Public Policy*, 26.5 (1999) 331, at p.333

¹⁸ <http://www.geoengineering.ox.ac.uk/oxford-principles/principles/>

adjudicate upon the acceptability of such risks [...]’¹⁹ As such, using a wider consultation process can make it less daunting for politics and science to solve problems on complex issues surrounding SRM research.

Public participation is a subset of RRI, the latter being a concept which is gradually gaining ground in the EU.²⁰ Innovating responsibly is a ‘continuous commitment to be *anticipatory, reflective, inclusively deliberative, and responsive*.’²¹ A deliberative model which includes not only scientific and political views but also drawing from other actors of the society such as NGOs or from the private sector thus yields to a more inclusive regulatory framework which departs from the purely technocratic model of the EU’s regulatory framework. The four aspects of RRI highlighted above allow other social and ethical aspects to be taken into consideration in the risk analysis of SRM research.

However, it will be unfitting to call for the discarding of the technocratic paradigm altogether to replace it with a deliberative one. Instead, a pragmatic stance in which the incorporated approach to SRM risk analysis is used only when there is significant scientific uncertainty is called for.²² As such, the EU retains its archetypical risk analysis model when the science is certain enough. Nevertheless, when the science is highly uncertain, the mixed technocratic and deliberative model should be used. In the specific context of SRM field research which is a trans-

¹⁹ Pidgeon, Nick, et al., ‘Deliberating Stratospheric Aerosols for Climate Geoengineering and the spice Project’, *Nature Climate Change* 3 (2013): 451, at p.451

²⁰ See <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation>

²¹ Owen R., Stilgoe J., Macnaghten P.M., Fisher E., Gorman M., Guston D.H (2013) ‘A Framework for Responsible Innovation’ Chapter 2, in (eds R.Owen., J. Bessant, M.Heintz,) *Responsible Innovation*, John Wiley, London: p.27-50, at p.29

²² Sargoni 2016, at p.105

scientific issue, the EU should depart from the *Meroni* doctrine to adopt a more flexible decision-making approach with a body composed of both scientific and political experts. This is of particular importance because we are faced with the notion of ‘organised irresponsibility’ which is a situation whereby society is unable to deal with the long-term consequences following from unparalleled and unknown risks - such as may be obtained from SRM research - even if advanced decision-making structures - such as the EU regulatory framework – actually exist.²³ The responsive and flexible framework will thus be more malleable so that legitimacy is maximized to include various actors in the governance of SRM.

IV. Conclusion

The EU’s risk analysis approach is an inherently technocratic process which separates science from politics in the assessment and management of risks respectively. Drawing on the EU’s current approach to GMOs, it has been argued that the risk analysis approach can be adapted to SRM research. Indeed, the EU regulatory approach will be effective for SRM research which has both transboundary and non-transboundary effects with the EU deciding on how much discretion should be accorded to Member States to conduct research on SRM. However, it would be irresponsible not to include policy input at the risk assessment stage because the institutional separation of risk assessment from risk management locks the regulatory model into a rigid and isolated one.

As such, an incorporated approach which allows science and politics to co-exist at the risk assessment stage, and a framework drawing from RRI, which includes public participation, would be a better solution to regulating SRM research in the EU.

²³ Beck, Ulrich (1999) *World Risk Society*, Cambridge: Polity Press

Only when the science is highly uncertain as is the case with SRM should the EU depart from its technocratic model to a mixed technocratic-deliberative one. The mixed technocratic-deliberative approach allows for SRM research to be regulated legally while also being anticipatory, reflective, inclusively deliberative, and responsive, thereby legitimising the whole process.

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