



Technical thresholds and societal concerns: Competing framings and their implications for governance

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Sean Low and Stefan Schäfer

Framings of risk for small scale SRM field-tests

- Technical Thresholds vs. Societal Concerns
- Some “proponents” of each frame

Are frames becoming entrenched and reflected in forms of governance?

Lock-in of current forms of governance?

- **Parson and Keith (2013):** “First, if large interventions need more control than small ones, how is the boundary between ‘small’ and ‘large’ defined?... For solar geoengineering, it might be defined by the product of **area, duration, and size of radiative forcing perturbation (ΔRF)**, perhaps at a level where global climate response is barely detectable—for example, global-annual-average $\Delta RF > \sim 10^{-2} \text{ Wm}^{-2}$.” (p. 1278-1279)
- **Victor et al (2013):** “The key is to draw a sharp line between studies that are small enough to avoid any noticeable or durable impact on the climate or weather and those that **are larger and, accordingly, carry larger risks...**” (p. 3)

- **Parson and Keith (2013):** “These are only “**geoengineering**” **research by virtue of their purpose**, and imposing large regulatory burdens on them will merely create incentives to misstate their purpose.” (p. 1279)
- **Victor et al (2013):** “And right now, the **politics of geoengineering are far ahead of the science**. As the 2010 decision within the Convention on Biological Diversity shows, fears about geoengineering are leading to counterproductive policy schemes. More practical understanding of what is at stake could help orient the debate, **and if the science is funded and published openly, then best practices and norms for behavior will emerge**. In time, those norms and new information will make it easier to focus treaty negotiations- if they prove necessary at all- on the aspects of geoengineering that actually need formal intergovernmental regulation.” (p. 3)

- **Robock (2008):** "... a moderate investment in *theoretical* geoengineering research might help scientists to determine whether or not it *is* a bad idea. Still, it's a **slippery slope**: I wouldn't advocate actual small-scale stratospheric experiments unless comprehensive climate modeling results could first show that we could avoid at least all of the potential consequences we *know* about." (p. 17-18).
- **ETC Group (2011):** "Even though a geographically small-scale experiment **may be designed to have "acceptably" limited impact on ecosystems**, the experiment will not be considered to be conclusive – especially by commercially interested advocates, who will in **turn press for larger tests...**" (p. 37)
- **Gardiner (2007):** "... Crutzen treats the decision to do **research and the decision to deploy as if they were causally isolated**. But it is not clear what justifies this assumption - indeed, the **history of technological innovation suggests otherwise.**"

- **Macnaghten and Szerszynski (2013):** "... as solar radiation management is becoming more clearly formed as a policy option, it is taking on a particular 'social constitution' – a distinctive set of implications about the sort of world that its deployment would likely bring into being... The ability to explore future worlds is perhaps the greatest challenge for deliberation on as solar radiation management." (p. 466, 467)
- **Corner et al (2013):** "But as with other emerging technologies before them, geoengineering proposals are likely to act as a catalyst for wider societal debates that reflect much more than simply an evaluation of the physical risks and benefits a particular technology may possess."
 - *Both on current research and governance endeavors, not on field-tests in particular*

- **ETC Group, “Ensuring Precaution on Geoengineering” Agenda Item 11.2 for CBD COP 11 (2012):** “We propose that in addition to the moratorium... Parties to COP11 could **support a ban on experimental geoengineering tests outside of a laboratory setting** that meet any of the three following criteria: a) They impact biodiversity; b) They either take place in the global commons (atmosphere, oceans, Arctic, Antarctic or outer space) or have impacts on these commons; c) They are intended to develop hardware for or to test Solar Radiation Management technologies.” (p3)
- **Macnaghten and Owen (2011):** “... (1) the test-bed deployment was safe and principal risks had been identified, managed and deemed acceptable; (2) the test-bed deployment was compliant with relevant regulations; **(3) the nature and purpose of SPICE would be clearly communicated to all relevant parties to inform and promote balanced discussion; (4) future applications and impacts had been described, and mechanisms put in place to review these in the light of new information; and (5) mechanisms had been identified to understand public and stakeholder views regarding the predicted applications and impacts.**”
 - *Early 2011 evaluation of five criteria for responsible innovation regarding SPICE test-bed (prior to cancellation)*

- **Technical Thresholds:**

- Relevant risks are defined by immediate physical impacts
- Linear relationship between physical risk and social risk: if environmental impacts are negligible, so are 'legitimate' risks
- Research and field-tests can reduce risk

- **Societal Concerns:**

- Risks are constructed based on perception and "lifeworlds"
- Research and small field tests raise deep uncertainties that cannot be linearly connected to first-order environmental risk
- Research may uncover more realms of inquiry toward risk

Technical Thresholds

- **Privileged Actors:** Technical experts
- **Required:** Technical expertise in setting *de minimis* standards of risk for tests, and in regulating that risk
- **Mechanisms and Frameworks:**
 - Self-governance, voluntary codes of conduct, generation of norms
 - Policy informed by results of and reactions to field-tests
 - Larger deployments (if ever) governed by national or international legal frameworks (but not yet!)

Societal Concerns

- **Privileged Actors (?):** More diffused contestation of stakeholder groups (not necessarily equitable)
- **Required:** Ban; impact assessments; wider and earlier socially-embedded assessments
- **Mechanisms and Frameworks (?):**
 - Forecasting and participatory processes with diverse audiences
 - Embedding above in regulation
 - governmental / international frameworks (?) – at least not left to scientists

Sub-state:

- *Proposed* principles, codes, registries, etc
- **Governance framework for SPICE test bed**
- **Public engagement research efforts***

International:

- **Convention on Biological Diversity**
 - **Non-binding** Decision X/33 (2010): **no GE activities affecting biodiversity until adequate scientific basis, with exception of small scale studies in controlled setting, and only to gather specific data and subject to assessment of env. impacts**
 - Study on governance and regulation issues of CE (2012)
- **London Convention and Protocol (marine GE)**
 - Resolution LC-LP.2(2010): adopts **Assessment Framework**, which sets out criteria on which to determine on a case-by-case basis if the proposed activity constitutes **legitimate scientific research** that is not contrary to the aims of the LC-LP
 - **wording is almost identical to the CBD decision** with respect to the objectives and future of regulation for geoengineering
 - currently **negotiating a binding amendment to regulate ocean iron fertilization** with the potential to include new technologies

- Early, limited landscape
- Technical Thresholds not reflected in governance of field tests, but...
 - Keith proposed SRM experiment
- Societal Concerns are, but...
 - How much resonance does “SPICE responsible innovation framework” have?
 - LC/LP has strongest development (negotiating binding resolution; legit research; EIA), but relevant only to OIF. What implications for SRM tests?
 - LC/LP has limited membership (42 parties)
 - CBD is non-binding, hazy language, lacks US

Literature on institutional path dependence seems most relevant?

- Are institutional arrangements at the international level more likely to become entrenched?
 - Complex? Self-governance frameworks? Anticipatory governance?
 - National agendas?
 - Does one exclude others? Are there advantages in being “first-mover”?
 - What implications?

Lock-in in one area of wider landscape affects others

- How are framings, technologies, and institutions entwined in lock-in dynamics?
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