Book Reviews

Reynolds, Jesse L. 2019. *The Governance of Solar Geoengineering: Managing Climate Change in the Anthropocene*. Cambridge: Cambridge University Press.

Reviewed by Simon Nicholson
American University

Solar geoengineering (also known as solar radiation management) is, by Jesse Reynolds' reckoning, an objectionable proposition that nevertheless demands attention. In *The Governance of Solar Geoengineering*, Reynolds offers a sweeping review of existing scholarship, policy proposals, and real-world efforts to steer a nascent and contentious set of climate change response options. The book then goes further to propose a set of steps that might be taken to fill governance gaps and to guide development of solar geoengineering from research through large-scale deployment.

Reynolds begins by summarizing the existing state of the computer modeling, physical science, and engineering research on solar geoengineering. The basic idea behind solar geoengineering is that boosting the reflection of incoming shortwave solar radiation back into space can cool the planet. The book traces early thinking along these lines back to the mid-1960s. From that time forward a number of different ideas to reflect sunlight have been mooted, from increasing the reflectivity of ground-level terrestrial or oceanic features (think lots of white roofs or reflective films spread on bodies of water), to the artificial brightening of marine clouds, to the introduction of sulfate particles into the upper atmosphere (this last option is usually called stratospheric aerosol injection). The latter two ideas in particular show promise, based on natural analogues and computer modeling, as ways to reduce certain of the impacts associated with climate change. At the same time solar geoengineering options pose an array of physical and social risks, such that, in Reynolds' measured words, "governance would be beneficial" (p. 31).

The middle section of the book unpacks and offers commentary on the scholarship and practical moves that have been made on solar geoengineering governance. It first looks at the problem structure of solar geoengineering from the vantage of international relations theory and practice. Stratospheric aerosol injection in particular could conceivably be undertaken by a single state or even a wealthy individual. This raises a set of questions about coordinating action, the control of potential rogue actors, and optimization of an activity that at scale would have the character of a global public good. Reynolds usefully engages with these questions and others, summarizing existing scholarship in an accessible fashion.

Global Environmental Politics 20:1, February 2020
© 2020 by the Massachusetts Institute of Technology

Downloaded from http://direct.mit.edu/glep/article-pdf/20/1/129/1818694/glep_r_00543.pdf by guest on 18 February 2025

The book then considers the governance of solar geoengineering from the perspective of international law. Though solar geoengineering proposals are nascent at best, with research work currently confined almost exclusively to computer modelling, there has been a great deal written about how international law might come to bear on solar geoengineering options. Parties to the Convention on Biological Diversity have made decisions and and an amendment has been proposed to the London Protocol to the London Dumping Convention related to geoengineering. Reynolds works in a systematic fashion through general relevant principles and norms of international law, regimes and organizations having to with the climate and atmosphere, human rights regimes and principles, and a selection of multilateral agreements pertaining to other domains, to show how the existing system of international law might affect the development and particularly the use of solar geoengineering approaches. The punchline is that there is already an architecture in place that could manage solar geoengineering. That said, some notable gaps in the ability of international law to handle, for instance, the specific expressions of liability and compensation for harm that solar geoengineering entails suggest the need for additional governance steps. Chapters on existing US domestic law and its bearing on and the roles of nonstate actors in governance round out the book's middle section.

The chapters that are organized expressly to look at existing scholarship and activity on domestic and international governance are bracketed by chapters that are a little harder to characterize. Chapter 3 stands apart as a meditation on what has been called the moral hazard challenge, renamed by Reynolds the "emissions abatement displacement concern" (p. 32). The concern is that contemplation or development of solar geoengineering responses might negate or distract from efforts to rein in greenhouse gas emissions. This possibility is often raised by those skeptical of or hostile to solar geoengineering research efforts. Reynolds, by contrast, thinks the emissions abatement displacement concern is basically bunk. He argues, via thought experiments and comparison with early days of the climate adaptation conversation, that the concern is not really grounded in how people are truly likely to respond to solar geoengineering but rather in "issues of political coalitions and wider worldviews" (p. 53).

The unpacking of the moral hazard claim hints at a broader aim of Reynolds' book—a defense of and call for a particular kind of examination of solar geoengineering. Full articulation of this broader aim, however, is reserved for the book's short conclusion, where he says that the main problem with solar geoengineering is that its "discourse is unduly driven by intuition, ideology, and preexisting conclusions instead of empiricism and rationality" (p. 222). Reynolds points out a number of times that current modeling research suggests that certain kinds of deployment of solar geoengineering options could reduce climate risk for just about everyone. Rather than come out directly, though, and argue for solar geoengineering research or a clear role for solar geoengineering as a climate

Downloaded from http://direct.mit.edu/glep/article-pdf/20/1/129/1818694/glep_r_00543.pdf by guest on 18 February 2025

change response option, the book strives for almost its entire length for scholarly disengagement. The result is a burying of some of the most important of the book's contributions. The final substantive chapter and conclusion, where Reynolds paints his own picture of solar geoengineering governance and rails against too-easy dismissal of a role for solar geoengineering technologies, finally reveal where the book has been headed all along. The book would have been all the stronger had it opened with the kinds of provocations with which it closes. Even those who most strongly disagree with Reynolds' ultimate positions will be forced to think by his careful argumentation.

Downloaded from http://direct.mit.edu/glep/article-pdf/20/1/129/1818694/glep_r_00543.pdf by guest on 18 February 2025

Wu, Fuzuo. 2019. *Energy and Climate Policies in China and India: A Two-Level Comparative Study*. New York, NY: Cambridge University Press.

Reviewed by Anthony Szczurek
Virginia Tech

A common notion bandied about today is the idea that India's and China's contemporary rise simply represents a return to pre-colonial levels of global economic, political, and cultural power. Scholarship increasingly gestures to the fact that, up until 1750, China, India, and Europe were on parity with each other in these areas, and for many centuries, Europe lagged far behind. Seen in this way, China's and India's colonial and postcolonial impoverishment are anomalies rather than long-lasting truths. Beyond the traditional debates about how their rise affects the contemporary Western-centric international system, the countries' impacts on global energy and climate trends are an understudied area of scholarship. Fuzuo Wu's comparative study of the two countries' energy and climate policies powerfully gestures toward the deep and growing dynamics between their actions and the intensifying climate crisis.

The question that drives Wu's inquiry is straightforward: "what forces have driven China's and India's energy and climate politics in general, and their energy and climate diplomacy in particular?" (5). On this point, the book is a success. Wu meticulously analyzes and distills the complex variables driving the countries' climate and energy policies. She shows that the primary distinction is between the international and domestic realms. In the international realm, she argues, the primary drive for each is the drive to secure its respective status as a great power. Domestically, economic growth is the sine qua non of statecraft (here there is little difference from most states in the West). Both states are also subject to an international system that is asymmetrically interdependent.

Taking both states as rational actors, Wu painstakingly demonstrates that, despite very different domestic political and energy environments, they act identically when trying to minimize their energy insecurity and to be seen as proactive members of the climate governance regime, the UN Framework Convention on Climate Change (UNFCCC).

Wu fruitfully raises many questions about the future of the international system in a world with a radically different climate than what human civilization has known for the past ten thousand years. Two of these questions are paramount. The first concerns the continued assumption of states as rational actors, even as the climate destabilizes to catastrophic levels. At one point, Wu, reviewing the debate between realists and liberals regarding the primary motivation of state actions—survival or wealth seeking—comes down decisively in favor of the latter. "Simply put, seeking wealth and trying different means to maximize it has become a top priority for states in the international system" (36). Yet we are already witnessing states facing existential threats: more than a thousand square kilometers of arable land turn to desert every year in China and increasing monsoon variability in India, to say nothing of Chennai, a city of 6 million, running out of water completely. One only need consider the ongoing debate over the extent to which climate crisis–induced droughts in Syria beginning in 2010 eventually led to the country's apocalyptic war. Will wealth and status remain the driving motivations for state actions, as they suffer massive crop die-offs, debilitating droughts and floods, sea level rise, and hundreds of millions of displaced people? On this point, the writing is already on the wall—it will be mildly interesting, to say the least, to watch how mainstream international relations theory adapts to the already existing climate crisis in coming years.

The second question Wu raises is the extent to which multilateralism remains a vital force in international energy and especially climate change policy. If climate change does begin to make states return to considering their survival first and foremost, rather than wealth or status, does the international system turn its back on multilateralism as a framework? Wu argues that China's and India's unilateral and bilateral actions are strongly challenging the legitimacy of the UNFCCC's top-down architecture: "Sino-Indian dynamic coalition strategy under the UNFCCC process … has made it unlikely that a top-down, comprehensive global architecture to address climate change will be forged collectively" (289). One would be hard-pressed to call the nearly thirty-year-old UNFCCC a success; greenhouse gas emissions have risen consistently and robustly, regardless of the many pages of protocols signed and the hundreds of international meetings held. But does this mean that a sovereigntist, "bottom-up" process where states individually choose their climate and energy policies is a better path forward?

Wu's book is a significant contribution to international relations scholarship on state climate and energy policies, especially in the Global South, giving both a clear picture of how we arrived at the present and clear intimations of where the international system is headed in this brave new world. The policies instituted by India and China over the next five to ten years will be decisive in determining whether the global climate somewhat stabilizes or goes out of control. From this view, the irony of these two countries' return to global influence and power cementing the destabilization of the global climate is palpable.

Downloaded from http://direct.mit.edu/glep/article-pdf/20/1/129/1818694/glep_r_00543.pdf by guest on 18 February 2025

Milkoreit, Manjana. 2018. *Mindmade Politics: The Cognitive Roots of International Climate Governance*. Cambridge, MA: MIT Press.

Reviewed by Matto Mildenberger
University of California, Santa Barbara

Collective and individual interests are central to theories of global climate politics. Yet, for all its sophistication, research on global climate negotiations often manages these concepts using methodological short-cuts. Theoretically, the beliefs of diplomats as agents are conflated with the beliefs of their principals or set by assumption through rational choice or constructivist frameworks. Empirically, variation in negotiator preferences is proxied by public opinion surveys or read as constrained by these easier-to-measure public preferences through concepts like audience costs.

In an important new book, Manjana Milkoreit offers a different way forward. Milkoreit still positions the motivations of political elites at the center of theoretical explanations for climate cooperation, but she argues that these motivations must be treated as a cognitive variable in their own right that requires theoretical elaboration and empirical scrutiny. The result is *Mindmade Politics*, an extremely ambitious book that meets the study of climate cooperation where its theories require, not where data collection is most convenient.

The book's first contribution is its careful effort to build a bridge between scholarship on global environmental politics and cognitive psychology. Milkoreit offers readers a nuanced but accessible survey of psychological theories of mental representation, cognition, and emotion. These sections alone provide an important primer on the politics of the mind that will interest readers of many backgrounds.

Its second contribution stems from its creative efforts to empirically elaborate the belief structures of climate negotiators. Using a series of novel methods, Milkoreit systematizes the mental models of dozens of climate policy–making elites. These include thirty-six senior climate diplomats—including twelve delegation heads—who represent a diverse cross section of thirty countries. Milkoreit also engages with nineteen nonstate actors from eight nationalities who represent a range of negotiation participant types.

Mindmade Politics analyzes the mindscapes of these actors in two ways. First, it uses a *cognitive–affective mapping* (CAM) approach. Milkoreit conducts in-depth interviews with each diplomat and nonstate actor and then uses cognitive psychological methods to diagram the semantic structure and emotional valence associated with their worldviews. This integrated portrayal of both cognitive and emotional content is particularly novel. The outcome is a series of cognitive–affective maps that Milkoreit uses to compare belief structure about climate change. For instance, these maps allow Milkoreit to contrast the relative centrality of particular negotiating concepts to climate cooperation. Second, Milkoreit deploys Q methodology on a subset of respondents. This approach invites individuals to rank order a large set of beliefs. Milkoreit can then analyze

Downloaded from http://direct.mit.edu/glep/article-pdf/20/1/129/1818694/glep_r_00543.pdf by guest on 18 February 2025

structural similarities in these rankings to elicit common sets of coherent belief structures.

These efforts represent a heavy empirical lift, but the payoff is substantial. The book's rich data allow Milkoreit to draw out the interplay of self-interest, norms, and identity that structures climate negotiations. She describes these interrelated components as the "cognitive triangle" of cost, identity, and justice. By examining the structure of this cognitive triangle across different climate negotiators, Milkoreit finds that two distinct belief systems motivate political elites. One group of climate negotiators focuses on human survival and suffering. These individuals have belief systems that are structured by moral judgments and involve strong emotional content. By contrast, a second group of negotiators focuses more directly on material climate risks, such as specific climate threats to national economies or infrastructure. This group's worldview has less emotional content and remains rooted in a more consequentialist ethic.

What explains variation in negotiator belief structures? Here Milkoreit emphasizes the importance of an individual's sense of group membership. Among individuals who feel their ingroup is directly threatened by climate change, the first, emotional, belief structure dominates. By contrast, the second belief system dominates among individuals who do not perceive an immediate risk from climate change to their ingroup or who see the threat as being distant. In this way, she traces how support for collective action is structured by actors' perceptions of their ingroup's vulnerability to climate change. At the extreme, negotiators who identify with all of humanity can have strong emotional belief structures, even if their individual country is only moderately threatened by climate change.

Beyond this central thesis, *Mindmade Politics* also draws out dozens of smaller but no less insightful features of climate cognition. In her analysis of belief structure using Q methodology, Milkoreit documents how shared priorities shape many climate negotiators' belief structures, while highlighting the areas where substantial differences remain: the value of moral frames for climate action, the importance of markets to risk mitigation, the breadth of participation necessary for effective climate treaties, and the importance of societal value shifts. Milkoreit also dives into a fascinating discussion of the inconsistent ways climate change is understood by some negotiators, including around such issues as lags in the climate system and climatic tipping points.

Of course, like any book with similar ambitions, *Mindmade Politics* asks more questions than it answers. It proposes new methods that will require additional replication as the scholastic community grapples with the study of the mind. The book is admirably forthright in describing the methodological limitations associated with both CAM and Q methodology. This will provide a clear guide for future work that builds on Milkoreit's approach.

Future scholars could also address two areas where the book's argument feels less complete. Milkoreit identifies important sources of variation in mental processes across different negotiators. Limited sample sizes prevent her from

Downloaded from http://direct.mit.edu/glep/article-pdf/20/1/129/1818694/glep_r_00543.pdf by guest on 18 February 2025

linking these directly to negotiation outcomes, but the book could engage more with the dynamics of climate negotiations in practice. How can unpacking the mental processes of negotiators concretely explain otherwise puzzling empirical features of global climate policy making?

Relatedly, the book could do more to elaborate the stakes of its empirical analysis for theories of climate cooperation. A fascinating concluding chapter reflects on the book's implications for practitioners. Yet the elaboration of negotiator belief structure has substantial implications for theories of climate cooperation. For example, in Milkoreit's account, concerns over free riding are mostly absent from the minds of climate diplomats, despite free riding being the starting point for most theoretical accounts of climate politics. Further elaboration of these issues would help emphasize the importance of taking the mind seriously in climate politics.

These reservations hardly detract from the many ways this original book is sure to stimulate necessary debates about global climate cooperation. It opens a new dialog with cognitive psychology that deepens our empirical understanding of climate negotiations. And it does the hard work of studying the motivations of political elites central to our theories but too rarely addressed empirically. *Mindmade Politics* does the field a great service and should persuade environmental politics scholars to take the mind more seriously in environmental governance research.

Downloaded from http://direct.mit.edu/glep/article-pdf/20/1/129/1818694/glep_r_00543.pdf by guest on 18 February 2025