



Solar geoengineering: An update and case for research

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Despite decades of recommendations that geoengineering research should be pursued, “The government has effectively decided that the best course here is ignorance,” Professor David Keith said in his presentation in the HKS energy policy seminar, which examined some recent research in this area, as well as sources of resistance to such research.

Keith argued that some of the most common arguments advanced against geoengineering research actually provide reason to support such work. For example, he argued, arguments that geoengineering itself, while it might reduce global warming, would do nothing to address other negative impacts of carbon emissions, such as ocean acidification. In fact, Keith explained, by slowing down certain impacts of warming, such as the release of additional CO₂ into the atmosphere through the melting of permafrost, geoengineering can have an impact on carbon concentrations themselves.

Furthermore, Keith explained, recent research suggests that some of the negative impacts feared from solar geoengineering may not be inevitable. For example, solar geoengineering methods may not have to damage the ozone layer. Sulfuric acid, which is what is most commonly thought of for use in geoengineering, can accelerate ozone destruction (though it is not yet clearly established what the magnitude of such effects would be); however, Keith notes, some new models he and his colleagues have been working on suggest that other materials could be used to scatter light—which could either reduce the impact on the ozone layer or, potentially, help to repair the ozone layer.

Keith emphasized that the modeling that suggests this possibility “could be totally wrong.” It is this uncertainty, he observed, that makes research including small-scale experiments potentially so useful.

Keith emphasized that his argument is not that geoengineering does not have significant risks. He argued that further research may reveal that it either cannot or should not be employed. However, he noted that there would be considerable benefits to know even such a discouraging answer sooner rather than later, enabling policy makers and scientists to better assess options. In fact, Keith noted, calculations of the value of having more information about geoengineering, even if this information only shows that geoengineering is not a good idea, have found significant value attached to greater knowledge. While the exact figure varies depending on your assumptions, it is “easy to get a value in the trillions of dollars NPV over the century,” Keith reported.

Given the potential benefits of geoengineering research, why does it meet with resistance? One factor, Keith suggested, is fear of “moral hazard.” Keith noted that many people assume that geoengineering will be treated as a substitute for other actions—making people less likely to take other steps to address climate change—but he observed that there is no *a priori* reason to assume this will be the case. It is also possible that further exploration of geoengineering would increase the likelihood of action in other areas—just as a patient put on blood pressure medication may also be inspired to make healthy lifestyle changes.

Keith spoke as part of the Kennedy School’s Energy Policy Seminar Series, which is jointly sponsored by the Energy Technology Innovation Policy research group of the Belfer Center and by the Consortium for Energy Policy Research of the Mossavar-Rahmani Center on Business and Government.