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Geoengineering rules needed sooner rather than later

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Momentum is gathering to respond to global warming using geoengineering instead of, or in addition to, carbon abatement policies. Last week Russia [proposed adding](#) support for research into methods such as sulphate aerosol spraying and ocean iron fertilization to the Intergovernmental Panel on Climate Change's (IPCC) Summary for Policy Makers, a move that would have given geoengineering – efforts to alter the Earth's natural systems to slow or reverse global warming - a powerful stamp of legitimacy.

Russia's move failed, but it only means a delay of six months because the third part of the IPCC's report, due out in April, will for the first time carry an assessment of climate engineering as a policy response.

A network of geoengineering researchers, some with links to entrepreneurs and large corporations, is pushing ahead and taking out patents. And research programs are now underway in the United States, China, Germany, Britain and Russia.

Experiments are proceeding too, from the 'rogue' geoengineer [Russ George](#) who spread iron slurry to fertilize the oceans off the coast of Canada, to the plans by prominent Harvard scientist [David Keith](#) to test spraying of sulphate particles in the stratosphere over Arizona.

Yet concern is mounting over the absence of oversight or regulation of these disparate global efforts to develop technologies to control the Earth's climate system. For the most part, the research scientists resist any kind of regulation, and certainly any international oversight.

“Trust us”, they say. “Our experiments will have no appreciable impact on the environment, and when we get to the point where they do involve risks, then some kind of governance will be needed.”

But by then the geoengineering lobby may be so powerful that imposing an effective governance regime may prove impossible. The history of major new scientific research programs (such as genetic modification of organisms, nanotechnology and stem cell research) tells us that the

political and social risks of new technological paradigms [are often as important](#) as any potential physical harms.

TECHNOLOGICAL LOCK-IN

Once a scientific, commercial and political constituency forms, technological lock-in may mean the dangers of climate engineering are downplayed, ignored or suppressed. And if a research program normalises geoengineering as a solution to climate change then it may reduce the incentives to curb greenhouse gas emissions, especially if it is taken up by political leaders looking for a cheap way out of the dilemma.

In a political and commercial environment where cutting emissions appears too hard, geoengineering arrives as the next great white hope. Economists like the authors of *Superfreakonomics* have seized on it and promoted it in a crude way.

Already in the United States, right-wing think tanks like the American Enterprise Institute, the Cato Institute and even the Heartland Foundation - organisations that have for years promoted denial of climate science - [are now advocating](#) geoengineering as a *substitute* for cutting emissions.

For them, geoengineering promises to turn a drastic failure of the free enterprise system into a triumph of human ingenuity. Instead of climate change being a vindication of environmentalists' warnings, climate engineering exposes their lack of faith in humanity. Instead of shrinking from technological hubris, the call is for greater mastery over nature.

Many scientists, including some of the most influential working on geoengineering, believe that research can be kept pure from the sullyng effects of "politics". They believe that after the knowledge has been generated by objective research, then politics and ethics can come into play to govern how it might be used.

But it is impossible to separate decisions about what is studied and how it is studied from funding levels, funding sources, institutional priorities, publication aims and complex decisions about what to report and how to report it. There is a difference between research done by disinterested scientists generating transparent results funded by the public and research carried out in-house by an oil company with results kept secret or subject to a commercial patent.

DOES 'PLAN B' END 'PLAN A'?

In practice, society can more easily influence the direction of a new technology in its early phases; once it becomes entrenched society has less control because its momentum is driven by the internal dynamics and incentives of the research community, backed by external parties and institutions that have acquired an interest in it.

So before it begins and once it starts, geoengineering research is saturated with politics. After all, 'Plan B' is now being researched only because of the dramatic failure of governments to agree on 'Plan A'.

The fact that Plan B is attracting support from political actors who have explicitly repudiated climate science and campaigned against emission reductions also speaks to its undeniable political context.

For all of these reasons, a major research program into geoengineering makes the deployment of those schemes more likely. The risks associated with geoengineering research are principally social and political, and the appeal to scientific objectivity cannot sweep away the essential practical and ethical concern that scientists are not entitled to conduct research into geoengineering in the absence of means to control its deployment.

An early, comprehensive and transparent governance structure - in which the concerns of developing nations could find expression - would serve to temper any rush into insufficiently proven geoengineering schemes and act as a counterweight to the pro-geoengineering constituency that is already taking shape.