# Climate Engineering

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RODGER A PAYNE, AUG 19 2009

It may be August, when many policy wonks take vacation in Washington and other capitals, but Bjørn Lomborg's Copenhagen Consensus Center is in the midst of releasing a series of papers analyzing potentially affordable solutions to global climate change.

I haven't had the time to read them all — and some are still forthcoming, but I'll note the paper by Dr. J Eric Bickel and Lee Lane because the topic has been receiving surprising publicity this year:*An Analysis of Climate Change as a Response to Global Warming* (pdf). This is from the summary:

Climate engineering could offer an extremely cheap, fast solution to climate change, according to this comprehensive analysis of its costs and benefits.

An Analysis of Climate Engineering as a Response to Climate Change by Dr. Eric J Bickel and Lee Lane shows that we might be able to cancel out this century's global warming by spending no more than $9 billion, and that climate engineering might be able to achieve as much for the planet as carbon cuts at a fraction of the cost.

The authors explore three different methods of climate engineering and conclude that a modest expenditure of $9 billion might yield $20 trillion worth of benefits.

Responding "Perspective" papers are more skeptical, though the authors agree that more research is needed.

This year, I have noticed a number of popular press articles about climate geoengineering. In January,*The National Interest* published an optimistic piece by Fred C. Iklé and Lowell Wood (pdf). Then, last week the *Financial Times* ran an interview with Lomborg about the papers his think tank issued.

The most frightening piece, however, ran in the *Atlantic Monthly*'s July/August 2009 issue. Graeme Wood acknowledges that sulfur-aerosol injection could "reverse anthropogenic climate change entirely" for no more than $100 billion (and perhaps a fraction of that cost). However, Wood notes the potential downside of this technique as well:

Opponents say it might produce acid rain and decimate plant and fish life. Perhaps more disturbing, it's likely to trigger radical shifts in the climate that would hit the globe unevenly. "Plausibly, 6 billion people would benefit and 1 billion would be hurt," says Martin Bunzl, a Rutgers climate-change policy expert. The billion negatively affected would include many in Africa, who would, perversely, live in a climate even hotter and drier than before. In India, rainfall levels might severely decline; the monsoons rely on temperature differences between the Asian landmass and the ocean, and sulfur aerosols could diminish those differences substantially.

Worst of all is what Raymond Pierrehumbert, a geophysicist at the University of Chicago, calls the "Sword of Damocles" scenario. In Greek legend, Dionysius II, the ruler of Syracuse, used a single hair to suspend a sword over Damocles' head, ostensibly to show him how precarious the life of a powerful ruler can be. According to Pierrehumbert, sulfur aerosols would cool the planet, but we'd risk calamity the moment we stopped pumping: the aerosols would rain down and years' worth of accumulated carbon would make temperatures surge. Everything

would be fine, in other words, until the hair snapped, and then the world would experience the full force of postponed warming in just a couple of catastrophic years.

Graeme Wood says that the scariest aspect of geoengineering is its relatively low cost. A rich individual (more than 3 dozen people in the world have over $10 billion in private assets) or even a poor state like Bangladesh could afford sulfur-aerosol injection without the cooperation of major powers, the United Nations, or people potentially adversely affected by the climate changes that would ensue.

Nearly everyone I spoke to agreed that the worst-case scenario would be the rise of what David Victor, a Stanford law professor, calls a “Greenfinger”—a rich madman, as obsessed with the environment as James Bond’s nemesis Auric Goldfinger was with gold.

If this all sounds like science fiction — or perhaps like early thinking about the effects of nuclear weapons on world politics — this might partly reflect the fact that nuclear strategists are among those “thinking the unthinkable” now.

Fred C. Iklé, Thomas Schelling, and Freeman Dyson, for example, have participated in nuclear debates long before anyone ever heard of climate geoengineering. As my own career began with more traditional national security concerns, this is certainly not a criticism. I’m all for smart people applying their brains to major global problems.

However, we should probably keep in the mind the notion that not every idea imagined by scientists should be pursued — just because they can do something incredible, or because it is fairly cheap. Nuclear weapons were a major technological achievement and they are relatively inexpensive. Plus, they may well have contributed to the deterrence of major power war for more than half a century. Yet, the world will have to live with the technology forever and it may see the day when nuclear weapons are again used in anger with horrific consequences.

As Graeme Wood’s piece emphasizes, climate engineering potentially opens a Pandora’s box. Scientists certainly need to know a lot more before turning the sky “a dramatic red, like the skies in Blade Runner.”

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