

The Washington Post

Threat of global warming sparks U.S. interest in geoengineering

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By Juliet Eilperin
Washington Post Staff Writer
Monday, October 4, 2010; A4

It's come to this: Climate-conscious policymakers are beginning to contemplate the possibility of playing God with the weather in the hope of slowing global warming.

For years it was considered downright wacky in official Washington to discuss [geoengineering](#): altering the climate by reflecting sunlight back into the sky, sucking carbon dioxide from the air - or a host of other gee-whiz schemes. But in the past year the wacky has won a following, spurred in part by the recent collapse of climate legislation as well as by growing interest among private entrepreneurs and foreign officials.

[House Science and Technology Committee Chairman Bart Gordon](#) (D-Tenn.), whose panel will jointly release a report on climate engineering with the British House of Commons this month, said the subject is "just now starting to get some attention" even though people recognize the danger in trying to change a complex weather system.

"The more you know about it, the more you're concerned about if we can ever implement it," Gordon said in an interview. "However, there may be a point where we're up against the tipping point, and the consequences of climate change are even worse."

Over the next few months, whispering about changing the weather will evolve into written recommendations. Several key groups - including the Government Accountability Office and a bipartisan [task force](#) of experts - will issue their thoughts on how best to start a modest federal research program on geoengineering.

"We're getting a sense that agencies are interested in this topic and would be open, on a certain level, to letting this program go forward," said Jane Long, who co-chairs the National Commission on Energy Policy's task force.

At this point, though, even the experts most seriously looking at climate engineering describe it as a last resort for when climate impacts become a serious threat and the world has yet to wean itself off fossil fuels.

"Geoengineering only makes sense - if it makes sense, and that's an important conditional - as a way to bridge this crisis period," said Steven Hamburg, the Environmental Defense Fund's chief scientist.

Climate engineering can be divided into two basic categories, both of which are untested on a large scale: solar radiation management, which aims to deflect sunlight away from the Earth, and carbon dioxide removal, which takes already released greenhouse gases out of the atmosphere.

The first approach is relatively cheap and easy to deploy - researchers envision spraying small metallic particles or sulfur into the stratosphere, which could be accomplished with jets or even World War II-era howitzers - but this would do nothing to address the root causes of climate change or some of its worst effects, such as ocean acidification. The second method would address the atmospheric concentrations of carbon that

can spur climate change, but it would take more time to develop and be much more expensive.

At this point, many scientists argue that it is worth scrutinizing different geoengineering techniques to see what could work and what will not. At a conference last week sponsored by Arizona State University, the New America Foundation and Slate magazine, University of Maryland distinguished professor of economics Thomas Schelling said "field experiments are going to be essential" to determine whether humans can manipulate the climate in a responsible and effective way.

"If solar radiation management is a bad idea, the sooner we discover that the better," said Schelling, who serves on the National Commission on Energy Policy task force.

Ralph J. Cicerone, president of the National Academy of Sciences, has been interested in geoengineering for 20 years, but he said he kept a low profile on it because he didn't want to foster the perception abroad that Americans were looking for a quick fix on climate. Now, however, he said these ideas should be subject to peer review.

"It's important for the federal agencies to get involved and at least solicit proposals," Cicerone said. "The best way to handle these issues is to treat it like normal science."

Those who have been most skeptical about dire warming forecasts, however, are unlikely to embrace climate engineering.

"You'd have to see concrete evidence for the worst case, and that's not there," said Patrick J. Michaels, a senior fellow at the Cato Institute, adding that it was hard to imagine how any proposed project could satisfy a federal environmental impact statement.

Other countries are already doing that, in part because, as University of Southampton professor John Shepherd explained, the world needs to reach a consensus on geoengineering "before some nut case does it [prematurely](#)."

Shepherd oversaw the [geoengineering report](#) that the Royal Society issued last year, and he is co-chairing an effort - along with the Environmental Defense Fund and the Academy of Sciences for the Developing World - to look at what rules could govern [solar radiation management](#).

This year the British government approved spending \$4.5 million over three years on geoengineering research; the German Federal Ministry of Education and Research has a small program, as does the European Union.

There has been some pushback on the idea of even doing research at all: Delegates to the Convention on Biological Diversity meeting this month in Nagoya, Japan, may consider a proposed moratorium on all geoengineering activities, including studies.

In a sense, the geoengineering debate mirrors what happened on the question of adapting to climate change, a once-sensitive subject that is now a standard part of policymaking. For years people were wary of discussing how to adapt to global warming, on the grounds that it would reduce the incentive for cutting greenhouse gases. Now, funding for adaptation is a major part of international climate negotiations, and the Fish and Wildlife Service recently detailed how it plans to modify its operations based on the inevitable warming the United States will face in the coming decades.

U.S. officials are reluctant to discuss climate engineering in public: the Office of Science Technology Policy declined to comment on the matter, as did the Energy Department. Gordon, who is retiring from Congress, expressed optimism that staffers would still work on it next year.

In fact, starting to investigate the feasibility of deliberately changing the climate won't require a massive

allocation of federal dollars, in part because agencies ranging from the Environmental Protection Agency to the National Oceanic and Atmospheric Administration are already conducting related research that could easily be expanded to encompass it.

Long, who serves as principal associate director at large at Lawrence Livermore National Laboratory, described it as "a tweak with existing funding and existing programs," but added that administration officials "need to be covered by someone telling them to do it, because it's so controversial."

Rep. Bob Inglis (R-S.C.), who sits on the House science committee and is also leaving office, said he worries about what it means to even try to change the climate on a small scale.

"Once you've done an experiment, you've done it, and you've got to hope for the best. That's generally not the way you want to do scientific research," Inglis said, adding that the world might be better off just cutting greenhouse emissions outright. "Investing in research is like investing in better brake linings, when taking your foot off the accelerator would do just as well."

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