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Willing to give up blue skies for climate fix?

Geoengineering gets closer look as a 'Plan B' in case emissions don't fall



Brian West / American Geophysical Union

A new study describes pros and cons of cooling Earth via a thin cloud of aerosols. Techniques cited to do that are, from left, artillery cannons, a miles-long tower, military aircraft and stratospheric balloons.

By **Miguel Llanos**

Reporter
msnbc.com
updated 3:58 a.m. PT, Fri., Oct. 30, 2009



Miguel Llanos
Reporter

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We can probably engineer Earth's climate to cool the planet, scientists say, but are we willing to live with the downsides? Those could include creating more droughts, more ozone holes and, oh yeah, a thin cloud layer that obscures blue skies and gives astronomers fits.

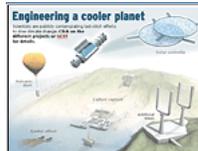
With potential negatives like that it's no wonder that "geoengineering," as the technique is called, has few hardcore advocates.

Instead, a growing cadre of scientists is asking whether it should be a "Plan B" in case emissions of greenhouse gases aren't reduced in time to head off major consequences.

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Experts gathered Friday at the Massachusetts Institute of Technology were discussing just that at a seminar called "Engineering a Cooler Earth: Can We Do It? Should We Try?"

Two key geoengineering approaches have surfaced: removing carbon dioxide from the atmosphere, and reflecting the Sun's rays away from Earth.

The former focuses on using the oceans to absorb carbon dioxide, which takes a long time and acidifies the seas, harming corals and shellfish.

The latter is seen as more realistic, especially the leading strategy of lobbing sulfur into the atmosphere the way volcanoes do. The 1991 eruption of Mount Pinatubo in the Philippines cooled the planet by 0.9 degrees Fahrenheit.

While it doesn't remove CO₂ — and as a result, ocean acidification would continue — adding sulfur could reduce temperatures quickly.

Weighing pros, cons

At issue, though, is whether the benefits would outweigh the costs.

In a study published this week on the sulfur approach, a Rutgers University team stacked benefits against costs. The key pros: a cooler planet; reduced or reversed melting of ice sheets and [Arctic sea ice](#); and increased plant productivity.

The key cons: more droughts in Africa and Asia; oceans would still be acidifying; creation of ozone holes in the Arctic; reduced solar energy production; and those less blue skies and frustrated astronomers.

"We have not calculated how hazy yet, but it would be global," lead study author Alan Robock told msnbc.com. "Injection into the tropical stratosphere would produce a global cloud. It would have to be regular with the frequency depending on the injection method and the thickness of the desired cloud."

Writing in the peer-reviewed journal *Geophysical Research Letters*, the team concluded that, given existing technology, the best method of lobbing aerosols would be via high-altitude military jets at a cost of several billion dollars a year.

But it also warned that more needs to be learned before society is sufficiently informed to make a decision.

"Several billion dollars per year is a lot of money, but compared to the international gross national product, this amount would not be a limiting factor in the decision of whether to proceed with geoengineering," the authors wrote. "Rather, other concerns, including reduction of Asian monsoon rainfall, ozone depletion, reduction of solar power, psychological effects of no more blue skies, and political and ethical issues, will need to be compared to the potential advantages before society can make this decision."



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'Last resort' strategy

Leading scientific groups have also taken stands on the technique.

The American Meteorological Society, for one, has endorsed the idea of researching geoengineering as a Plan B.

"Geoengineering will not substitute for either aggressive mitigation or proactive adaptation," it said in a adopting a policy statement this year, "but it could contribute to a comprehensive risk management strategy to slow climate change and alleviate some of its negative impacts."

But the society is also among those emphasizing that geoengineering should not become an excuse for policymakers to back off action that reduces emissions.

"The possibility of quick and seemingly inexpensive geoengineering fixes could distract the public and policymakers from critically needed efforts to reduce greenhouse gas emissions," it warned.

The Institute of Physics, a nonprofit with 36,000 members, echoed that view. "Climate geoengineering at scale must be considered only as a last resort," it says in its own statement. "There should be no lessening of attempts to otherwise correct the harmful impacts of human economies on the Earth's ecology and climate."

Geoengineering, it adds, "should be seen as a prudent precautionary measure in case all other attempts to control dangerous climate change fail or are inadequate — for whatever reason."

Robock, for one, wants increased spending. "Absolutely," said the environmental sciences professor at Rutgers. "We need a research program now to evaluate different potential engineering designs and to look in much more detail at the climate and other effects."

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In the United States, policymakers are starting to listen to the scientific discussion. The House Science Committee next Thursday will hold its first hearing on the implications of geoengineering. Robock is among those set to testify.

"The hearing is by no means an endorsement of deploying geoengineering, but an effort to begin a thoughtful, in-depth conversation," committee spokesman Alexandria Dery Snider told msnbc.com. "We don't want to shy away from the issue because it is complex and potentially controversial."

"It's important to note that we are not looking at geoengineering as an easy way out of changing how we consume energy," Dery Snider added. "Geoengineering may, however, be a stopgap to buy us some time, if we find ourselves in a dire situation."

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