



Answers for moving America.  
The next generation of high-speed could be built by Americans, for Americans.

[See How](#)

SIEMENS



From the [November 2008 Scientific American Magazine](#) | [51 comments](#)

## Geoengineering: How to Cool Earth--At a Price

( Preview )

Global warming has become such an overriding emergency that some climate experts are willing to consider schemes for partly shielding the planet from the sun's rays. But no such scheme is a magic bullet

By [Robert Kunzig](#)

Image no longer available.

The full versions of this and other articles from the print edition—including all graphics and sidebars—are available for purchase at Scientific American Digital.

[Click here to go to Scientific American Digital](#)

### Key Concepts

Many scientists now support serious research into “geoengineering,” deliberate actions taken to slow or reverse global warming.

Of the various geoengineering proposals, the ones that shade the earth from the sun could bring about the most immediate effects. But all of them have drawbacks and side effects that probably cannot be anticipated.

Pumping sulfur dioxide into the stratosphere, as volcanoes do, is the most well established way to block the sun. Other proposals call for brightening clouds over the oceans by lofting sea salt into the atmosphere and building a sunscreen in space.

E-MAIL

PRINT

COMMENT

Like it?  
Thumbs-up



Stumble!

### More from the Magazine



November 2008 Issue

Letters to the Editors

[Readers Respond on "The Self-Organizing Quantum Universe"--And More...](#)

News Scan

[Hotel Case Study: Peer Pressure's Impact on the Environment](#)

News Scan

[Cancer Vaccine: Looking Beyond Tumor Size](#)

[Buy the Digital Edition](#)

When David W. Keith, a physicist and energy expert at the University of Calgary in Alberta, gives lectures these days on geoengineering, he likes to point out how old the idea is. People have been talking about deliberately altering climate to counter [global warming](#), he says, for as long as they have been worrying about global warming itself. As early as 1965, when Al Gore was a freshman in college, a panel of distinguished environmental scientists warned President Lyndon B. Johnson that carbon dioxide (CO<sub>2</sub>) emissions from [fossil fuels](#) might cause “marked changes in climate” that “could be deleterious.” Yet the scientists did not so much as mention the possibility of reducing emissions. Instead they considered one idea: “spreading very small reflective particles” over about five million square miles of ocean, so as to bounce about 1 percent more sunlight back to space—a wacky geoengineering solution,” Keith says, “that doesn’t even work.”

In the decades since, geoengineering ideas never died, but they did get pushed to the fringe—they were widely perceived by scientists and environmentalists alike as silly and even immoral attempts to avoid addressing the root of the problem of global warming. Three recent developments have brought them back into the mainstream.

### GET THE REST OF THIS ARTICLE NOW

SUBSCRIBE

BUY THIS ISSUE

Already a Digital subscriber? [Sign-in Now](#)

If your institution has site license access, enter [here](#).

[Read Comments \(51\)](#) | [Post a comment](#)

SHARE



### You Might Also Like



Kavli Institute for Theoretical Physics



The September 2008 issue of the *Philosophical Transactions of the Royal Society A*



Bracing the Satellite Infrastructure for a Solar Superstorm



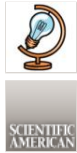
Boundaries for a Healthy Planet



20 Reasons Why Geoengineering May Be a Bad Idea



Alan Robock's article and the debate it triggered



World Changing Ideas: 20 Ways to Build a Cleaner, Healthier, Smarter World



Arctic Plants Feel the Heat

Discuss This Article

Ads by Google

**Service Down and Fares Up**

Stop Service Cuts and Fare Hikes. Text the words "OUR RIDE" to 69866. [www.ourride.org](http://www.ourride.org)

**Become a Science Teacher**

Earn A Degree in Science Edu. NCATE Certified Programs Online. Sign Up! [www.WGU.edu](http://www.WGU.edu)

**Listen to Audio Books?**

WeRead4You launches Aug 2010. The world of Audio books is changing. [AudioBooks.WeRead4You.com](http://AudioBooks.WeRead4You.com)

