

# Scientists: artificial steps against global warming may be dangerous, necessary

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Courtesy Royal Society  
and World Science staff

Humanity may be forced to take costly, untested and possibly dangerous artificial measures to curb global warming, if efforts to do so the natural way prove too feeble, a group of scientists says.

The “natural” way would be by cutting carbon dioxide emissions—but most scientists and environmentalists say that such cuts have been too little and quite possibly too late.



Some proposed measures against global warming involve dispersing particles in the atmosphere that would deflect some sunlight away from the planet. (Image courtesy NASA)

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A report published Sept. 1 by the Royal Society, the U.K.'s national academy of science, found that artificial measures will need to go into gear unless future efforts to reduce carbon and similar “greenhouse gas” emissions are much more successful than they have been so far.

The artificial options are known as geoengineering technologies. The report concludes that these are probably technically possible and could be useful to complement emissions cuts efforts. But the report identified major uncertainties regarding their effectiveness, costs and environmental impacts.

“It is an unpalatable truth that unless we can succeed in greatly reducing [carbon dioxide] emissions we are headed for a very uncomfortable and challenging climate future, and geoengineering will be the only option left,” said John Shepherd of the National Oceanographic Centre in Southampton, U.K., who chaired the study.

“Our research found that some geoengineering techniques could have serious unintended and detrimental effects on many people and ecosystems—yet we are still failing to take the only action that will prevent us from having to rely on them.”

The report assesses the two main kinds of geoengineering techniques: carbon dioxide removal and solar radiation management. The first address the root of the problem—rising carbon dioxide—and so is thought to have fewer uncertainties and risks. But none has yet been demonstrated to be effective at an affordable cost, with acceptable environmental impacts, and they only work to reduce temperatures over very long timescales.

Solar radiation management acts by reflecting the sun's energy away from Earth, meaning they lower temperatures rapidly, but do not affect carbon dioxide levels. They therefore fail to address the wider effects of rising carbon dioxide, such as ocean acidification, and would need to be deployed for a very long time, scientists say. Although they are relatively cheap to deploy, there are considerable uncertainties about their regional consequences, and they only reduce some,

but not all, of the effects of climate change, while possibly creating other problems, according to researchers.

“None of the geoengineering technologies so far suggested is a magic bullet,” said Shepherd.