

Climate engineering offers little hope of mitigation

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Injecting particles into the stratosphere to shade and cool the Earth will never stop climate change. This is the shocking claim made in the July issue of *Nature Climate Change* by an international group of prominent scientists, including Dutchmen Marten Scheffer from Wageningen University and Aart de Zeeuw from Tilburg University.

An international agreement was drawn up in 1992 to stabilise the concentration of greenhouse gases in the atmosphere at a level that would make it possible to limit [climate change](#). Despite this, atmospheric concentrations of carbon dioxide (CO₂) and methane have continued to increase and measures to limit emissions have had little effect. The CO₂ concentration has now passed the limit of 400 ppm (May 2014: 401.88).

Solar radiation management

In theory, the amount of solar radiation that falls on the Earth can be limited quite simply by dispersing fine sulphate particles (aerosols) high in the atmosphere (the stratosphere). The group of scientists investigated whether applying solar radiation management would have the desired effect and, if so, whether such an international-level intervention was politically achievable.

They showed that although geo-engineering can reduce the average temperature of the Earth, it cannot halt climate change. In fact, it would result in a completely new climate with very different effects in different regions. As these effects would be negative in some areas of the world (extreme drought, for example), it is highly unlikely that political consensus would be achieved.

Risks

Furthermore, geo-engineering is not without risk. For example, there is much uncertainty about the effects on the distribution of precipitation and heat around the world. Its application to solve a regional problem (to extend the monsoon season, for example) can lead to unpredictable, new problems for other countries. Achieving political consensus is most likely if the world as a whole is faced with a major disaster, such as the melting of the Greenland ice sheet. However, even then politicians will

ask themselves – given the risks involved in geo-engineering – whether adaptation to climate change is not a better solution.

This is a blow to technocrats, acknowledge the researchers. 'In any case, geo-engineering is not going to be the breakthrough that some had expected.'

More information: Climate engineering reconsidered, Scott Barrett, Timothy M. Lenton, Antony Millner, Alessandro Tavoni, Stephen Carpenter, John M. Anderies, F. Stuart Chapin III, Anne-Sophie Crépin, Gretchen Daily, Paul Ehrlich, Carl Folke, Victor Galaz, Terry Hughes, Nils Kautsky, Eric F. Lambin, Rosamond Naylor, Karine Nyborg, Stephen Polasky, Marten Scheffer, James Wilen, Anastasios Xepapadeas and Aart de Zeeuw. *Nature Climate Change*, July 2014.

www.nature.com/nclimate/journal/article/2/7/2278

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