

Geoengineering: we need more evidence before we cast our vote

Government and scientists need more and better information on the pros and cons, and the only way to achieve this is with appropriate research

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guardian.co.uk, Wednesday 14 September 2011 06:30 BST

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One of the proposed geoengineering techniques involves releasing into the atmosphere small particles, such as sulphates, to reflect a small percentage of the Sun's energy back into space. Photograph: Gallo Images/Getty Images

This Wednesday, scientists will publish details of a long-proposed but controversial experiment on the feasibility of [geoengineering the planet's climate](#).

One of the proposed techniques involves releasing into the atmosphere small particles, such as sulphates, to reflect a small percentage of the Sun's energy back into space. The Stratospheric particle injection for climate engineering (Spice) experiment, [as the Guardian reported last month](#), will use a balloon to lift a hose about 1km into the air to test the feasibility of pumping liquids into the atmosphere. The experiment will not spray anything other than tapwater into the air, so it is not a test of [geoengineering](#), since it will not have any effect on the climate or the weather. The research will simply test the mechanics, and has negligible environmental risks.

However, scientific research does not exist in a vacuum and such experiments take place in a complex social context. [Some environmental groups feel](#) that even physically harmless tests could represent the first step onto a slippery slope that would ultimately lead to full scale deployment of these technologies. This is a legitimate concern.

However, to accept that "nothing should ever be done for the first time" is a counsel of despair that would have left our society devoid of many of the scientific advances from which we now benefit, had it been adhered to in the past. If the technology is found to be undesirable we must of course, ensure that it is not used.

Geoengineering the climate is a controversial subject, and rightly so. The [Royal Society published an influential report reviewing the topic in 2009](#), but neither supports nor opposes geoengineering in general, and does not support any particular research projects, financially or otherwise. The report warned of the great uncertainty about the feasibility, costs, effectiveness and environmental and social consequences of almost all geoengineering ideas. However, it concluded that unless major cuts to greenhouse gas emissions are made soon, geoengineering technologies may become necessary.

I've concluded that geoengineering research – and I emphasise the term research - is, sadly, necessary. Our report was very clear that geoengineering does not provide an alternative to cutting emission and adapting to climate change, and that these activities must remain our top priorities. However, current emissions cuts are not enough and political aspirations are not yet leading to effective global action. The possible impacts of climate change could be disastrous for vulnerable people, and failing to explore ways to mitigate climate change, in addition to emission cuts, would be irresponsible.

What we really need is more and better information. The only way to get that information is through appropriate research.

Geoengineering, like climate change itself, is a global issue that affects us all, and therefore governance of research, and international co-operation, will be crucial. The UN Convention on Biological Diversity has decided that small-scale and low-risk field trials are acceptable (and the proposed Spice experiment is certainly one of these), but it did not define the boundaries of what is considered "small scale". Indeed there are, at present, no adequate international agreements to restrict or control many possible geoengineering activities, especially those in the atmosphere, and little experience of applying international legislation to this area.

We must ensure that any geoengineering research is conducted in a transparent, responsible and environmentally safe manner. A wide-ranging debate that involves all points of view is needed, and the Royal Society is working on a project to do just that.

As a scientist, I don't want to have to make decisions based on ignorance, and I don't believe that members of the public want that either. Those who prefer their decisions to be based on evidence should probably wait a bit before casting their vote on geoengineering.

• Prof John Shepherd is Chair of the Royal Society Working Group on Geoengineering

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