

Expert discusses the prospects of climate engineering

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Credit: Wits University

Climate engineering may offer a last-ditch technological solution to catastrophic climate change, but who makes the decisions on which solutions to implement, and who the beneficiaries will be? Once we start fiddling with the Earth's fundamental processes, where will it end? Schalk Mouton asks Professor Bob Scholes.

What exactly is climate engineering?

Climate engineering, formerly known as geoengineering, are big-scale technological solutions to fight [climate change](#) if we fail in doing the obvious thing, which is to urgently and radically reduce global emissions of greenhouse gases. It includes ambitious and largely untested technologies that could keep the world liveable, if not exactly ideal.

Can you give examples of some of the ideas being researched? Are any viable?

One example of [climate](#) engineering is Carbon Capture and Storage, which involves taking CO₂ streams from industry, compressing them, and injecting them deep underground into places where they can't escape back to the atmosphere. This approach is technically possible and proven at moderate scale, but it is very expensive. Another example is the fertilisation of the oceans with iron, to promote phytoplankton growth. Phytoplankton absorb CO₂, die and sink to the ocean floor, thereby burying the carbon deep in the ocean. This has been tested at small scale, but it does not work very well and has lots of unintended consequences. There are about 10 other serious contenders, such as the plan to inject shiny sulphur particles into the stratosphere to reflect some [solar radiation](#).

Why is climate engineering controversial?

For climate engineering to work, it has to take place at massive scale, and is therefore sure to have lots of side effects which we don't yet understand. Secondly, it may seem to many to be a 'get out of jail free' card, which distracts us from doing what we know we have to do, but lack the political will. Thirdly, there is the question of who makes the decisions on what global measures to take, and who the main beneficiaries will be, since the outcomes are patchy.

What are the pros and cons of climate engineering?

Pro: It could save the lives of future generations.

Con: It could fail, in which case it would have stopped us from doing the things we should have done earlier, such as decreasing our greenhouse gas emissions. There are a lot more cons too, such as unintended consequences, impermanence, and inequities in governance or decision-making.

If we are in a climate crisis, should we not try anything to remove the threat, and would engineering solutions be a reliable, sustainable option?

We need to explore these solutions well before we are in crisis mode. We know what our options are. Some climate engineering ideas are quite benign and may be good things to do anyway.

Are there any climate engineering projects going on in South Africa? Why or why not?

Yes, there is work on Carbon Capture and Storage going on at the South African National Energy Development Institute. The Global Change Institute at Wits is about to begin a major project looking at the potential and problems with four [climate engineering](#) ideas, which could find application in South Africa.

Any further thoughts on climate engineering?

There are two main sorts, carbon removal technologies and solar radiation mitigation. The former is much more benign, but the latter may offer some apparently cheap and quick but temporary fixes, which a wealthy country or individual might be tempted to undertake unilaterally,

without properly examining the consequences.

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