

World needs climate emergency backup plan, says expert

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In submitted testimony to the British Parliament, climate scientist Ken Caldeira of the Carnegie Institution said that while steep cuts in carbon emissions are essential to stabilizing global climate, there also needs to be a backup plan. Geoengineering solutions such as injecting dust into the atmosphere are risky, but may become necessary if emissions cuts are insufficient to stave off catastrophic warming. He urged that research into the pros and cons of geoengineering be made a high priority.

"We need a climate engineering research and development plan, in addition to strong measures to reduce greenhouse gas emissions" testified Caldeira, a faculty member of the Carnegie Institution's Department of Global Ecology in Stanford, California, at an inquiry on geoengineering convened by the Innovation, Universities, Science and Skills Committee of the House of Commons on November 10.

"Prudence demands that we consider what we might do in the face of unacceptable climate damage, which could occur despite our best efforts to rein in greenhouse gas emissions," he said.

Climate engineering (or geoengineering) refers to controversial proposals to deliberately modify the Earth's environment on a large scale, primarily to counteract greenhouse warming. One scheme would cool the planet by injecting dust into the upper atmosphere to scatter incoming sunlight. Other possibilities include enhancing cloud cover over the oceans. Critics question the effectiveness of these schemes and worry that tampering with the Earth's systems would create as many

problems as they solve. But others warn that currently accelerating carbon emissions may push the planet's climate system to a tipping point, making drastic measures necessary to prevent an environmental calamity.

"Science is needed to address critical questions, among them: How effective would various climate engineering proposals be at achieving their climate goals? What unintended outcomes might result? How might these unintended outcomes affect both human and natural systems?" said Caldeira. "Engineering is needed both to build deployable systems and to keep the science focused on what's technically feasible."

Caldeira advocates a university-based research effort involving scientists and engineers representing a range of disciplines. "A climate engineering research plan should be built around important questions rather than preconceived answers," he advised the committee. "It should anticipate and embrace innovation and recognize that a portfolio of divergent but defensible paths is most likely to reveal a successful path forward; we should be wary of assuming that we've already thought of the most promising approaches or the most important unintended consequences."

"Only fools find joy in the prospect of climate engineering. It's also foolish to think that risk of significant climate damage can be denied or wished away," he said. "Perhaps we can depend on the transcendent human capacity for self-sacrifice when faced with unprecedented, shared, long-term risk, and therefore can depend on future reductions in greenhouse gas emissions. But just in case, we'd better have a plan."

Full submitted statement (go to page 99) is available at:

[www.publications.parliament.uk ... /mo/1264/contents.htm](http://www.publications.parliament.uk.../mo/1264/contents.htm)

Transcript of oral testimony will be available at:

www.publications.parliament.uk/pa/cm/cmdius.htm

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