CONGRESS CONSIDERS GEOENGINEERING

"The nation that controls the weather will control the world." That headline appeared in Collier's magazine in 1954. Until recently, though, most ideas involving the overhaul of Mother Nature retained a sci-fi quality: fun to read, impossible to implement. But last November, U.S. lawmakers held the first congressional hearing on geoengineering — the intentional manipulation of Earth's climate to counter global warming.

The hearing, slated as the first of several, indicates that some lawmakers think the time has come to probe a concept that involves seemingly improbable measures, including hoisting giant mirrors into space to deflect sunlight away from Earth and injecting sulfates into the air that mimic volcanic eruptions to reduce global temperatures. By joining the geoengineering debate, U.S. lawmakers are positioned to play a key role in researching and developing technologies that, if applied, would have far-reaching global consequences.

This is a controversial topic; some have compared these preliminary discussions to the early discussions of nuclear weapons technology. "My decision to hold this hearing should not in any way be misconstrued as an endorsement of any geoengineering activity," said Rep. Bart Gordon, D-Tenn., chair of the House Committee on Science and Technology, in his opening remarks at the hearing.

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> – Ken Caldeira, Stanford University

Broadly speaking, geoengineering involves two options — removing greenhouse gases from the atmosphere or managing how much solar radiation reaches Earth — explained expert witness Ken Caldeira, an environmental scientist at Stanford University in Palo Alto, Calif. Each option encompasses multiple technologies and comes with different drawbacks, he added. Carbon removal would likely take a long time to take effect and would be almost impossible to reverse. In contrast, sunlight management options would take effect almost immediately but would then require constant, and expensive, upkeep.

Caldeira and other scientists at the hearing warned that implementation of such technologies is a long way off. But the time to speak about geoengineering has arrived, Caldeira told EARTH. "I used to think it was dangerous to talk about [geoengineering] because it might take away motivation to reduce emissions," he says. "Now, I think to deny that there will be climate change is like being an ostrich with its head in the sand. Pretending climate change won't happen won't make it go away." Furthermore, he says, if you take the risk of dangerous climate change seriously — that is, the kind that will cause loss of life and human suffering — then it would be irresponsible not to look into the options.

But too many unanswered questions remain to proceed safely, said Alan Robock, a climatologist at Rutgers University in New Brunswick, N.J., who also testified at the hearing. "What temperature do we want the planet to be?" he asked. "Do we want it to stay constant? Do we want it at 1980 levels? Do we want it at 1880 levels? And who decides?" These questions, Robock testified, make clear that we need much more research into geoengineering. Currently scientists don't have the technology to eject particles into the air to dim the sun; nor do they have a way to observe those particles once released, he said.

But Caldeira thinks such questions are secondary. Before we can debate the particulars, he says, we need to figure out how to reduce global temperatures. "If you are in a burning building, you would like to get out of the building. Once you are out of the building, you can discuss whether you would rather go to Albuquerque or Phoenix," he says.

For the next hearing, tentatively scheduled for the first half of the year, Mike MacCracken, a researcher at the Climate Change Institute in Washington, D.C., who was not involved in the hearing, would like to see lawmakers and scientists focus on specific environmental problems, such as stronger hurricanes and rising sea levels. They should then match the technology to the problem, not the other way around, he says.

But, MacCracken adds, he is happy that these talks are moving forward at all. Not talking about geoengineering while global temperatures continue to rise, he says, is "like letting the whole house catch fire before you turn on the hose."

Sujata Gupta

ONE BIG BITE

Richard Edmonds, earth science manager at the Dorset County Council in England, poses behind the jaw of an extinct 12-meter-long-plus marine reptile.

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It's a pair of jaws even Steven Spielberg might gape at. Discovered by fossil hunter Kevan Sheehan along the shores of southern England, the chops were once part of the 2-meter-long head of a pliosaur — an extinct type of marine reptile that hunted the Jurassic seas about 155 million years ago. Possibly belonging to a new species, the jaws were large enough to swallow a person whole, said Sam Scriven, earth science advisor at the Dorset County Council, which helped secure the find, in a press release. Sheehan noted in the same release: "In 40 years of collecting, I have often been green with envy at some of the finds other people have made. But now when someone shows me a find, I can say, 'That's not a fossil … This pliosaur, that's a fossil!'"

Brian Fisher Johnson