Atmospheric engineering scheme to combat global warming could diminish solar power

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A widely discussed "atmospheric engineering" scheme intended to combat global warming could have unanticipated consequences in reducing the effectiveness of certain kinds of solar power around the Earth, a new study has concluded. It is appears in the current issue of ACS' *Environmental Science & Technology*, a semi-monthly journal.

In the study, the National Oceanographic and Atmospheric Administration's Daniel M. Murphy examines a proposal to minimize climate change by enhancing the stratospheric aerosol layer, which reduces sunlight to Earth by scattering it to outer space. But this approach has considerable implications on the ability to concentrate solar power, Murphy says. For example, the increased aerosols resulting from the 1991 eruption of Mt. Pinatubo in the Philippines reduced global sunlight by less than three percent but decreased output from some solar generating plants by about 20 percent.

Murphy's study found that aerosols reduce direct sunlight - the kind that casts shadows - much more than total sunlight. Each one percent reduction in the Earth's sunlight due to aerosols will cause a four to 10 percent loss in output from concentrating solar power applications. He notes, however, that flat solar hot water and photovoltaic panels — which utilize both direct and diffuse (scattered) sunlight — will have smaller performance losses than concentrating solar collectors.

"One consequence of deliberate enhancement of the stratospheric aerosol layer would be a significant reduction in the efficiency of solar

power generation systems," Murphy concludes. "Any cooling of the Earth that relies on light scattering, including tropospheric aerosol scattering and increased cloudiness, by particles will also result in reductions in direct sunlight that are several times the reductions in total sunlight."

Source: American Chemical Society (news : web)