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# Cloud ships on course to beat climate change, says Copenhagen study



(Marc Aspland/The Times)

It is hoped that the clouds produced by the "cloud ships" could cancel out the greenhouse effect

Ben Webster, Environment Editor, and Hannah Devlin

They sound like ideas from a Jules Verne novel, but giant engineering schemes designed to alter the climate offer the cheapest way of avoiding catastrophic global warming, according to a growing number of scientists and green-minded entrepreneurs.

Most of the schemes have been dismissed as impossibly expensive or impractical, such as the proposal to create a space sunshade by using rockets to deploy millions of mirrors in the stratosphere.

One relatively cheap solution, however, is gaining favour among many different groups and is endorsed today by an independent study that compares the costs and benefits of all the main ideas. A wind-powered fleet of 1,900 ships would criss-cross the oceans, sucking up sea water and spraying it from the top of tall funnels to create vast white clouds.

These clouds would reflect a tiny proportion, between 1 and 2 per cent, of the sunlight that would otherwise warm the ocean. This would be enough to cancel out the greenhouse effect caused by carbon dioxide emissions. The ships would be unmanned and directed by satellite to locations with the best conditions for increasing cloud cover. They would mainly operate in the Pacific, far enough from land to avoid interfering with rainfall.

The idea has been circulating for a decade but until now has merely been one of many climate engineering pipedreams. A study commissioned by the [Copenhagen Consensus Centre](#), a think-tank that advises governments on how to spend aid money, found that the fleet would cost \$9 billion (£5.3 billion) to test and launch within 25 years. This is a fraction of the \$250 billion that the world's leading nations are considering spending each year to cut CO2 emissions.

The Royal Society is expected to announce next month that cloud-forming ships are one of the most promising ideas.

The Copenhagen study also looked at a scheme to mimic the effect of major volcanic eruptions, which have a global cooling effect lasting a year or more. The eruption of Mount Pinatubo in the Philippines in 1991 sent billions of tonnes of sulphur dioxide and other particles into the atmosphere. These formed a haze that shielded the sun's rays and reduced global average temperature by about 0.5C.

The eruption of Mount Tambora in Indonesia in 1815 had an even more dramatic effect: 1816 became known as the year without summer.

Many scientists have proposed different methods of injecting particles, or aerosols, into the atmosphere, including using squadrons of air tankers, possibly based in the Arctic to focus on protecting the ice cap.

The study concluded that the scheme would cost \$230 billion and would be much harder to control than cloud-producing ships, which could be switched off if shown to have adverse effects. The study dismissed the space sunshade idea after calculating that the costs of launching the mirrors would be \$395 trillion.

“The space sunshade is really just science fiction but cloud whitening ships deserve serious scrutiny,” said Bjorn Lomborg, director of the think-tank. He argues that, although global warming is a huge problem, there might be better ways of addressing it than simply cutting CO2 emissions. “We need to have a debate about all of the options, not just the politically correct one of reducing CO2,” he said.

He is hosting a conference in Washington DC next month at which a panel of Nobel laureates will vote on the most cost-effective solution.

Rival teams of British and American scientists are seeking funding for sea trials of prototype cloud-forming ships. The Carnegie Institute has donated several hundred thousand dollars to the US team. The British team, led by John Latham, an atmospheric physicist at the University of Manchester, and Stephen Salter, an engineer at the University of Edinburgh, is working with a Finnish shipping company, Meriaura.

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