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July 28, 08

Adding Lime to Oceans Could Reduce CO2 to Pre-Industrial Levels

Scientists say they have found a workable way of reducing carbon dioxide levels in the atmosphere by adding lime to seawater. And they think it has the potential to dramatically reverse CO2 accumulation in the atmosphere, reports Cath O'Driscoll in SCI's Chemistry & Industry magazine.

Shell is so impressed with the new approach that it is funding an investigation into its economic feasibility. 'We think it's a promising idea,' says Shell's Gilles Bertherin, a coordinator on the project. 'There are potentially huge environmental benefits from addressing climate change -- and adding calcium hydroxide to seawater will also mitigate the effects of ocean acidification, so it should have a positive impact on the marine environment.'



Adding lime to seawater increases alkalinity, boosting seawater's ability to absorb CO2 from air and reducing the tendency to release it back again.

However, the idea, which has been bandied about for years, was thought unworkable because of the expense of obtaining lime from limestone and the amount of CO2 released in the process.

Tim Kruger, a management consultant at London firm Corven is the brains behind the plan to resurrect the lime process. He argues that it could be made workable by locating it in regions that have a combination of low-cost 'stranded' energy considered too remote to be economically viable to exploit -- like flared natural gas or solar energy in deserts -- and that are rich in limestone, making it feasible for calcination to take place on site.

Kruger says: 'There are many such places -- for example, Australia's Nullarbor Plain would be a prime location for this process, as it has 10 000km3 of limestone and soaks up roughly 20MJ/m2 of solar irradiation every day.'

The process of making lime generates CO2, but adding the lime to seawater absorbs almost twice as much CO2. The overall process is therefore 'carbon negative'.

'This process has the potential to reverse the accumulation of CO2 in the atmosphere. It would be possible to reduce CO2 to pre-industrial levels,' Kruger says.

And Professor Klaus Lackner, a researcher in the field from Columbia University, says: 'The theoretical CO2 balance is roughly right...it is certainly worth thinking through carefully.'

The oceans are already the world's largest carbon sink, absorbing 2bn tonnes of carbon every year. Increasing absorption ability by just a few percent could dramatically increase CO2 uptake from the atmosphere.



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