COUNTERINTUITIVE CLIMATE SOLUTION AIMS FOR ATMOSPHERIC RESTORATION

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On May 20, 2019,*Nature Sustainability*-published a study detailing a seemingly counterintuitive climate solution, seeking atmospheric restoration by converting one greenhouse gas into another. Global warming has been commonly attributed to the increasing levels of carbon dioxide; however, studies suggest "methane is 84 times more potent in terms of warming the climate system over the first 20 years after its release." Rob Johnson, the lead author of this Stanford-led paper, claims this climate solution has the potential to restore the concentration of methane to pre-industrial times. With methane levels reaching nearly two and a half times more than pre-industrial levels, it is necessary to consider all the options that may alleviate climate change.

Some current techniques used to address climate change include preventing the release of greenhouse gases and reducing what is already present in the environment. Planting more trees and underground sequestration are intended to control the carbon dioxide concentration levels. Biomass energy and direct-air capture are also systems utilized to remove carbon dioxide from the atmosphere. Although these strategies have been useful, solely eliminating carbon dioxide is not powerful enough to reach pre-industrial gas concentrations.

Because of this, researchers are considering an alternative approach. Data shows that methane concentration levels have reached 1,860 parts per billion, compared to pre-industrial concentrations of 750 parts per billion. Simply removing the methane source, such as natural wetlands, rice fields, and livestock production, would be an unfeasible task. Instead, researchers are evaluating the means to reduce the amount of methane in the atmosphere by converting methane to carbon dioxide. The process would begin with capturing methane using zeolites, a crystalline material made of aluminum, silicone, and oxygen. These zeolites would encapsulate copper and iron, catalyzing the process. A contraption with electric fans may be used to force air into a chamber and heat would then be applied to carry out the gas converting process.

Various materials have been considered. For instance, another crystalline material that may be applicable are porous polymer networks. These networks are made up of polymeric material containing smaller pores which hold the ability to create specific chemical interactions with methane. The study also indicates that this method may be applied to other greenhouse gases that react with nitrogen oxide and cause ozone pollution.

Not only does this approach possess atmospheric benefits, but may even produce profits in the long run. It was expressed that "if market prices for carbon offsets rise to $500 or more per ton this century, as predicted by most relevant assessment models, each ton of methane removed from the atmosphere could be worth more than $12,000." With the potential to reinstate pre-industrial gas concentration levels and to generate millions a year, researchers are driven to solidify this process. There is hope that this climate solution will lead to atmospheric restoration and more.

The California Environmental Attorneys are Bick Law LLP will continue to monitor the new methods introduced to address climate change.

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