Bacteria: The low-tech fix for high-tech carbon capture?

By Greenbang on Nov 05, 2009 in Carbon, Featured

The solution to capturing carbon dioxide from the atmosphere and storing it safely away to prevent dangerous climate change might lie not with advanced technologies but with humble bacteria.

That's the goal of a European initiative, CO2Solstock, that's looking for ways to use bacteria to capture and store carbon dioxide … and to bring that capability close to commercial viability as quickly as possible.

While plant-based photosynthesis is the most recognised way in which nature absorbs carbon dioxide, bacteria and other micro-organisms also take up carbon, turning it into rocky carbonate rather than complex carbohydrates.

Microbes, for example, are believed to have formed about 40 per cent of the world's chalk cliffs. Other types of bacteria absorb carbon in other settings, including hot springs, hydrothermal vents and even in water pipes, where carbon is deposited in the form of "scales" that cause headaches for the water industry.

The three-year EU-funded quest for microbial carbon capture and storage (CCS) is being led by four universities: TU Delft, the University of Edinburgh, the University of Granada and the University of Lausanne.

Bacteria-based CCS offers several potential benefits over other CCS strategies now in development. For one, by transforming carbon dioxide into a solid, it would eliminate the challenges involved with safely storing away large volumes of carbon dioxide in gas form. Bio-based carbon capture could also require less energy, making it a more efficient strategy.

Bacteria-based carbon capture could even help generate materials for construction and other applications via biocementation.

Bio-based CCS isn't likely to require genetically modified microbes, either.

"The micro-biological processes available in nature are already tuned to environmentally satisfying conditions," states the CO2Solstock website. "Furthermore, the number of metabolisms available in this realm is known to be considerable. It is much more attractive to test what already works without risking adverse environmental problems."

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