New electrical device can turn CO2 into biofuel

Washington, April. 27 -- Researchers in the US have made a new electrical device that could improve fuel cell technology by turning carbon dioxide (CO2) into methane, a potential biofuel.

According to a report in ABC News, the technique won't combat global warming directly, since both CO2 and methane are potent greenhouse gases, but it could help store alternative energies such as wind and solar more efficiently. Small jolts of electricity are given to single-celled microorganisms known as archaea, which prompts them to remove CO2 from the air and turn it into methane, released as tiny bubbles. The methane can be used to power fuel cells or to store the electrical energy chemically until it's needed. "We found that we can directly convert electrical current into methane using a very specific microorganism," said Bruce Logan, a professor at Pennsylvania State University. "We envision this as a way to store electrical energy, to convert electricity into a biofuel," he said. Archaea are older, and more primitive, than bacteria, lacking a nucleus and other cellular machinery. Most archaea are still a mystery to scientists, but methane-producing archaea, known as methanogens, are well known. They team up with termites to digest wood pulp. With other microorganisms, they help decompose organic matter. Now, scientists hope to use methanogens to create microbial fuel cells, which is where Logan's team found Methanobacterium palustre, the electricity-drinking, methane-emitting archaea, clustered around the cathode. In the natural environment, various bacteria emit electrons that the archaea use as fuel. The archaea are 80 percent efficient at conserving the electrical energy into the chemical bonds of methane, good enough that Logan and his team want to use the methanogen to store energy generated by intermittent power sources, like wind, solar or tidal energy.

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