New Type Of Fuel Cell; Turns Wastewater Into Clean Water And Electricity

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In the June 2004 issue of Mechanical Engineering, a publication of ASME, the magazine reports on a fuel cell that cleans domestic wastewater while producing electrical energy.
This new type of microbial fuel cell, which is in the early stages of research at Pennsylvania State University, takes the high concentration of organic matter found in wastewater and coverts it to energy. "Where a typical fuel cell runs on hydrogen, a microbial fuel cell relies in the anaerobic oxidation of organic matter - in this case, the wastewater - to produce electricity," says Mechanical Engineering.

According to researchers, if all the energy in the wastewater produced by 100,000 people can be recovered, it has the potential to generate 2.3 megawatts of electricity, or enough energy to power 1,500 homes.

One of the fuel cells in Penn State's research program generated enough electricity to power only a small fan. The goal of the research project, funded by the National Science Foundation, is to develop a fuel cell that can generate a steady 500 kilowatts of electricity, or enough electricity to power 300 homes.

The NSF estimates that the Unites States treats 33 billion gallons of domestic wastewater every year, at a cost of $25 billion. Much of that cost goes towards the energy needed to operate treatment-processing systems. According to Mechanical Engineering, the use of cheaper and more efficient microbial fuel cells could reduce the cost of wastewater treatment.

In addition to increasing the power production of the new fuel cell, the researchers are seeking ways to reduce production costs associated with materials and design configurations. The process may also offer solutions for creating more clean water for both developing and industrial nations. The research team expects to roll out an improved design in one to three years, according to Mechanical Engineering.

To view the entire article, "From Foul to Fuel," visit the ASME Web site at www.asme.org.

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The original press release can be found here.