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FOCUSED PULSED TECHNOLOGY: REDUCING THE COSTS OF TREATING WASTEWATER

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Treating sewage protects human health and the health of our environment, but it comes with a hefty price tag. Operating costs for a mid-sized municipal wastewater plant typically run to millions of dollars a year. Making the process more efficient could therefore yield big financial savings.

Adding a little electricity to the process could boost efficiency, says UW's Hyung-Sool Lee. Lee and his colleagues have found a way to pre-treat sewage sludge with pulsed electric fields.

In a large-scale test at Arizona's Mesa Northwest Water Reclamation Plant, the investigators sent thousands of high-voltage bursts of electricity through sewage sludge each second before exposing the sludge to bacteria.

The pulsed electric field breaks down complex organic solids, allowing bacteria to digest the waste more efficiently. This in turn releases more methane - a gas that can be captured and used as a fuel - and leaves less solid waste for disposal. On top of that, the process generates heat, eliminating the need for an external heat source to create the optimum temperature for bacterial action.

Focused pulsed (FP) technology isn't cheap. It costs US\$900 a day to run a unit capable of pre-treating 380 m³ of sewage sludge a day. However, according to the researchers, that investment pays off. By reducing the amount of biosolids to dispose of, increasing methane production and eliminating heating costs, FP pre-treatment could save the wastewater treatment plant more than half a million dollars a year.

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