

# Wastewater system generates energy, produces drinking water

December 1 2011

---

A Michigan State University researcher is using a \$1.92 million Department of Defense grant to develop a portable wastewater treatment system that could improve the military's efficiency.

The solar-bio-nano project, which is being spearheaded by Wei Liao, an MSU assistant professor of biosystems and agricultural engineering, also will generate energy and produce drinking water, thus providing a potential blueprint for the future of municipal/agricultural wastewater treatment systems.

During military operations, shipping from port to bases on or near the front lines can push the cost of water up to nearly \$60 per gallon. A portable, self-sustaining system would allow the bases to be more nimble and cost-effective, Liao said.

"Bases on or near the front lines could transport this small-scale system by semi-truck and will greatly reduce their demand for water and fuel," he said. "The integrated system can serve about 600 people, is patentable and hopefully can be scaled up to serve larger populations."

The integrated system will comprise three major components. First, the solar unit will use new materials and employ a novel configuration making it up to 80 percent lighter than traditional solar units. Second, biological conversion processes will break down wastewater and [food scraps](#) to produce methane that can be used as fuel. Finally, a nano-filtration system will then take the sewage from the biological processes

to provide drinking water.

If the team's project proves effective in military settings, it has great potential in a wide range of wastewater treatment systems, from agricultural operations to municipal wastewater treatment plants, Liao said.

"The short-term goal is to drive costs down and to allow the military to alleviate supply chains' overarching control over its maneuvers," he said. "The long-term goal is to apply advanced and integrated technologies to transform agricultural and municipal wastes from an environmental liability into a public and private asset."

Working with Liao on the project, are MSU colleagues Ilsoon Lee, an MSU associate professor of chemical engineering, and Abraham Engeda, an MSU professor of mechanical engineering. Liao's project was one of 32 initiatives funded by the DoD's Strategic Environmental Research and Development Program.

Provided by Michigan State University

Citation: Wastewater system generates energy, produces drinking water (2011, December 1) retrieved 19 April 2024 from <https://phys.org/news/2011-12-wastewater-energy.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.