Another ARPA-E grant

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MSU to share ARPA-E grant to develop technology for freshwater recovery from hydraulic fracturing wastewater

Michigan State University will share almost $3 million for developing a freshwater recovery system to extract clean irrigation water from hydraulic fracturing wastewater, thanks to funding from the U.S. Department of Energy’s Advanced Research Projects Agency-Energy (ARPA-E).

MSU is collaborating with Oregon State University and the University of Nevada Reno on the project “Freshwater Recovery System for Hydraulic Fracturing (FRESH-Frac) Using a Thermally-Actuated Nozzle-Demister.” The award is valued at $2,972,000.

Andre Benard, associate professor of mechanical engineering, will serve as MSU’s lead investigator, working with MSU Foundation Professor James Klausner, chair and professor of mechanical engineering.

Benard said the team’s goal is to develop a new process of extracting clean water from hydraulic fracturing wastewater and use it for irrigation, using low-grade solar or industrial waste heat.
“The MSU research focus will be designing the novel multiphase heat exchangers needed for the process,” Benard said. “We’re working on a system that will efficiently separate, condense, and reclaim purified water from wastewater, using a heat-activated swirling nozzle and in-line demister, which helps remove droplets from the vapor stream.”

Klausner said researchers at the institutions are collaborating to create a wastewater treatment technology that is modular, portable, scalable, and easily deployable in the field.

“There is a strong focus on delivering a low-cost wastewater treatment solution by leveraging the novel treatment system fabricated with low cost materials. The adoption of fracking wastewater remediation will have a positive environmental impact,” Klausner added.

ARPA-E is part of the U.S. Department of Energy and supports the development of innovative technologies to transform the nation’s energy system. It advances high-potential, high-impact energy technologies that are too early for private-sector investment by encouraging the development of entirely new ways to generate, store, and use energy. Since 2009, it has provided $1.8 billion in research and development. More on [ARPA-E](https://www.egr.msu.edu/news/2019/03/08/another-arpa-e-grant).

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The 2019 ARPA-E grant is the second one received by the Department of Mechanical Engineering since fall 2018. MSU and its partners, Arizona State University, Dresser-Rand, and Saudi Aramco Energy Ventures, received a competitive $2 million ARPA-E Award in September to develop innovative designs for long-duration storage on the U.S power grid. Read more on the first ARPA-E grant at: [MSU’s Transformational Energy Technology project](https://www.egr.msu.edu/news/2019/03/08/another-arpa-e-grant).

**Related Website:** [Communications contact: Patricia Mroczek](https://www.egr.msu.edu/news/2019/03/08/another-arpa-e-grant)

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