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Department of Civil and Environmental Engineering
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Distributed Resource Recovery from Brewery Wastewater

Time: May 16, 1:30-2:30 pm. Location: Holmes 287

Presented by:

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Abstract:

In our current energy climate, we can no longer afford to think of any stream as merely a waste stream. Wastewater is a potential feedstock of value, containing nutrient- and energy-dense compounds. Without technologies to efficiently extract that value, however, wastewater will remain a waste. Researchers have been working to develop such technologies, including microbial fuel cells and biofuel production from wastewater using algae. We have developed an alternative treatment system that combines encapsulated microorganisms and efficient gas extraction to treat high strength wastewater in a two-stage system while simultaneously generating and collecting both hydrogen and methane for energy. We have studied the effect of the encapsulant properties and operating conditions on performance and have modified a diffusion-reaction model to accurately describe the encapsulation system, enabling easier customization. The effluent from the reactors has also been used to grow mustard greens in a substrate-based soilless greenhouse system, providing a true “zero waste” option for co-located food- and beverage-based industries. Finally, we have scaled the system up to pilot-scale and are currently operating the system at a brewery.