OBJECTIVES
- Research and develop novel waste-to-resource technologies capable to convert organic wastes into value-added fuel and chemical products
- Fulfill commercialization and technology transfer of new waste-to-resource concepts
- Educate the next generation of engineers, scientists and policymakers on waste utilization design and practice

INFRASTRUCTURE
- MSU is the first campus in the U.S. that has a full range of anaerobic digestion research and development capacities from lab scale, pilot scale all the way to commercial scale.
- Laboratories: 1,500 sq. ft. lab in ADREC and 1,000 sq. ft. lab in Farrall Hall are equipped with GC, HPLC, LC-MS, spectrophotometer and DNA and protein analysis instruments.
- Pilot facility: 3,000 sq. ft. of high bay area in ADREC has two 100 L CSTR anaerobic bioreactors, four 300 L CSTR anaerobic bioreactors, two 40 L pilot-scale race-way algal reactors, one 100 L algal turf scrubber reactor, pilot biodiesel production unit and pilot solar bio-based power generation unit.
- Research anaerobic digestion & algal cultivation system: Includes one 1.6 m$^3$ CSTR anaerobic bioreactor, one 950 m$^2$ plug-flow anaerobic digester, one 600,000 btu/hr boiler, one 1,300 m$^2$ race-way algal cultivation unit, and one 300 m$^3$ race-way algal cultivation unit.
- Commercial anaerobic digestion system: Includes one 1,700 m$^3$ CSTR anaerobic digester, 8,700 m$^2$ post-digester/storage tank, and 0.4 MW combined heat and power unit.

RESEARCH AND DEVELOPMENT
- Supported by diverse funding sources including USDA, DoD, DOS, DOT, Bill & Melinda Gates Foundation, state funding agencies and private companies.
- Research includes: metagenomic analysis of different anaerobic digestion system to optimize microbial communities, and select and identify new microbes for biofuel/chemical production; self-sustained system to convert agricultural/municipal wastewater into potable water; new anaerobic digestion system for simultaneous production of transportation fuel and reclaimed water; value-added chemical production from organic wastes; and integrated farm-based biorefining etc.
- More than 15 faculty members from the MSU colleges of engineering, natural science, and agriculture and natural resources are involved.

SERVICES
- Feedstock evaluation for anaerobic digestion and other biofuels/chemicals production
- Biogas potential evaluation
- Biogas utilization of electricity and fuel production
- Nutrient management of agricultural wastes
- Agricultural wastewater reclamation
- Feasibility studies for anaerobic digestion and biorefining processes
- Testing anaerobic digestion and algal cultivation processes at various scales
- System modeling and design for waste utilization facility

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