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Sustainability decision making for integrated renewable bioenergy generation and water management systems

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Environmental and economic health depends on a sustainable supply of both water and energy. These two critical resources are inextricable and reciprocally linked. The generation of energy requires large amounts of water, while the treatment and distribution of water are dependent on reliable and low-cost energy. There are significant challenges in providing both clean, affordable water and energy. These challenges include: Water and energy resource depletion, high environmental impacts associated with conventional fossil fuels, emerging contaminants in watersheds, etc. A combination of life cycle modeling and targeted laboratory experiments is valuable for targeting these challenges in an integrated, strategic manner. This talk will present ongoing work related to assessing the feasibility and sustainability of integrated algae-based systems for simultaneous production of bio-based energy and wastewater treatment polishing. Results indicate that the integrated system will deliver both renewable bioenergy and enhanced water management, the latter via water quality improvement (i.e., the removal of aqueous nutrients comprising eutrophication potential and emerging contaminants) and water-supply mitigation (decreasing water demand of energy generation by wastewater recycling).

Biography

Yongli Zhang is an Assistant Professor in the Department of Civil and Environmental Engineering at Wayne State University in Detroit, Michigan. Her teaching and research interests focus on the sustainability of water-energy nexus. Her research group is interested in tackling these challenges by integrating bioenergy generation and water management for simultaneous production of bio-based energy and water quality improvement in an integrated, strategic manner via a combination of life cycle modeling and targeted laboratory experiments.

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