

Special Issue

Advanced Bioprocessing Approaches in Energy and Nutrient Recovery from Waste

Message from the Guest Editors

This Special Issue focuses on sustainable energy and nutrient recovery from manure and wastewater to advance circular economy principles and reduce environmental impact. It highlights innovative technologies for efficient resource recovery, primarily through biogas production via anaerobic digestion (AD), including upgrading techniques to enhance methane yield and purity. Alternative methods such as hydrothermal carbonization (HTC) are also examined for converting wet biomass into valuable hydrochar. The integration of thermochemical and biological processes is explored to maximize resource synergies. Microbial communities are discussed as key drivers for improving process efficiency and stability in anaerobic and other treatment systems. Additionally, the issue covers the application of computational modeling and machine learning for optimizing system design, predicting microbial dynamics, simulating integrated systems, and enhancing operational performance for large-scale applications. This issue provides a comprehensive overview of cutting-edge conversion technologies, microbial optimization strategies, and modeling approaches to promote sustainable waste management practices.

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Editor-in-Chief

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