

## Special Issue

# Life Cycle Assessment for Circular Waste and Wastewater Treatment

### Message from the Guest Editors

Cities and industries are shifting from linear waste disposal to circular waste-to-resource systems based on bioeconomy principles. Life cycle thinking offers a system view—covering collection, sorting, conversion, use, and end-of-life—to assess environmental, resource, cost, and social trade-offs.

This Special Issue therefore welcomes studies applying life cycle assessment (LCA), life cycle costing (LCC), social LCA (S-LCA), or integrated life cycle sustainability assessment (LCSA) to evaluate, compare, and improve circular pathways across biochemical (e.g., fermentation, anaerobic digestion, and enzymatic routes) and thermochemical platforms (e.g., pyrolysis, gasification, and hydrothermal processes). Focus areas include valorizing organic wastes (OFMSW, sewage sludge, agro-residues, seaweed, digestate) and wastewater, as well as converting inorganic and gaseous streams (CO<sub>2</sub>, syngas, off-gases) into bio-based intermediates and products. Topics of interest include CO<sub>2</sub> utilization, CCU, power-to-biochemicals, and syngas fermentation/upgrading to marketable chemicals like methanol, ethanol, organic acids, and platform chemicals.

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### Guest Editors

Dr. Alessio Castagnoli

Dr. Francesca Demichelis

Dr. Matia Mainardis

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### Deadline for manuscript submissions

15 September 2026



## Environments

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## About the Journal

### Message from the Editor-in-Chief

Environmental issues are quickly becoming central political, economic and academic topics of the twenty-first century. A large number of modern challenges are directly or indirectly caused by complex interactions between environmental issues. Such issues require interdisciplinary research, knowledge and insights to understand and, ultimately, for solutions to be found. Through the journal *Environments*, we strive to create a platform for meaningful discourse by accepting contributions from a wide range of fields. We sincerely hope you will consider publishing your distinguished work in this highly-accessible, peer-reviewed journal.

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### Editor-in-Chief

Prof. Dr. Sergio Ulgiati

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