

Concept of circular sewage and biowaste management for waterfront area

M.Zubrowska-Sudol¹, W.Borowska¹, J. Czajkowska¹, A. Dzido², B. Karolinczak¹, A. Knap-Baldyga¹, P. Krawczyk²,
P. Marczewski¹, G. Niewinski², K.Ramm¹, K.Sytek-Szmeichel¹, J.Walczak¹, O.Zajac¹,

¹Faculty of Environmental Engineering, Warsaw University of Technology, Nowowiejska 20, 00-653 Warsaw, Poland

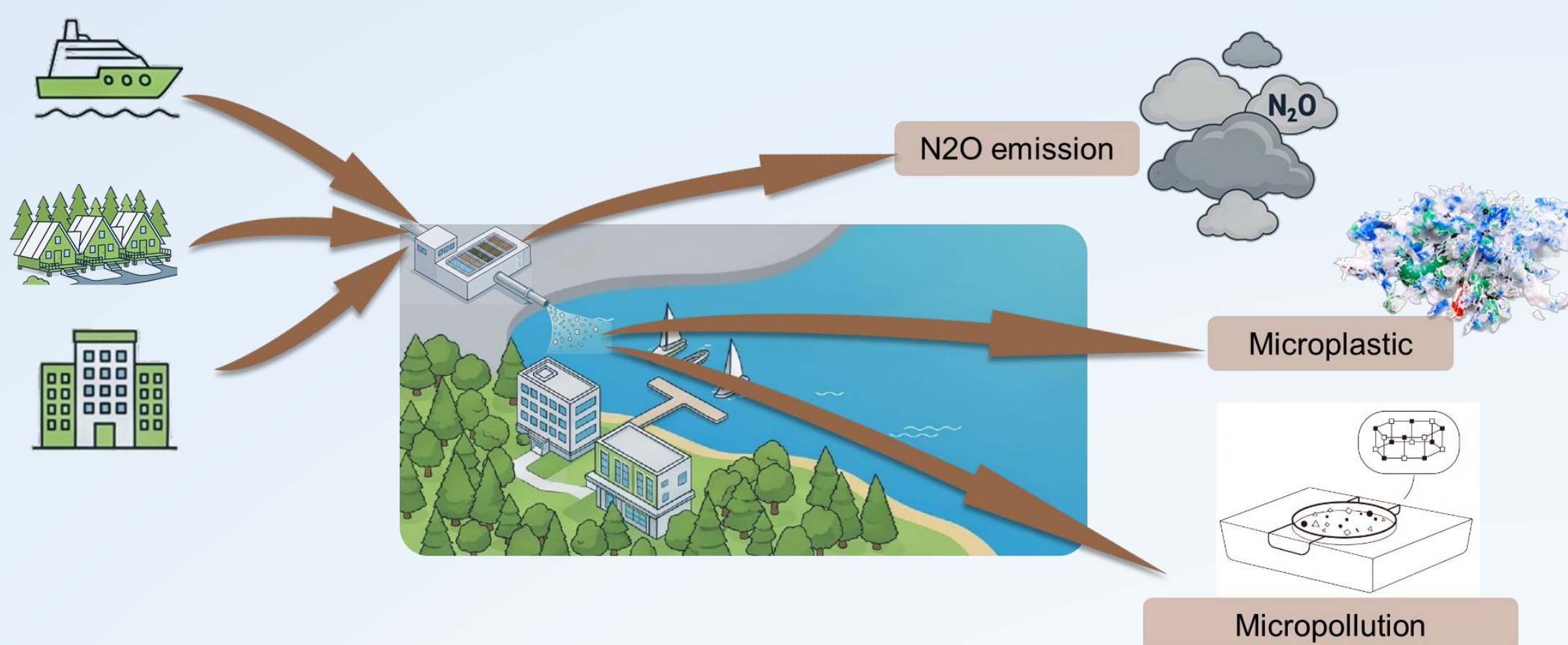
²Institute of Heat Engineering, Warsaw University of Technology, Nowowiejska 21/25, 00-665 Warsaw, Poland
(E-mail: monika.sudol@pw.edu.pl)

Introduction



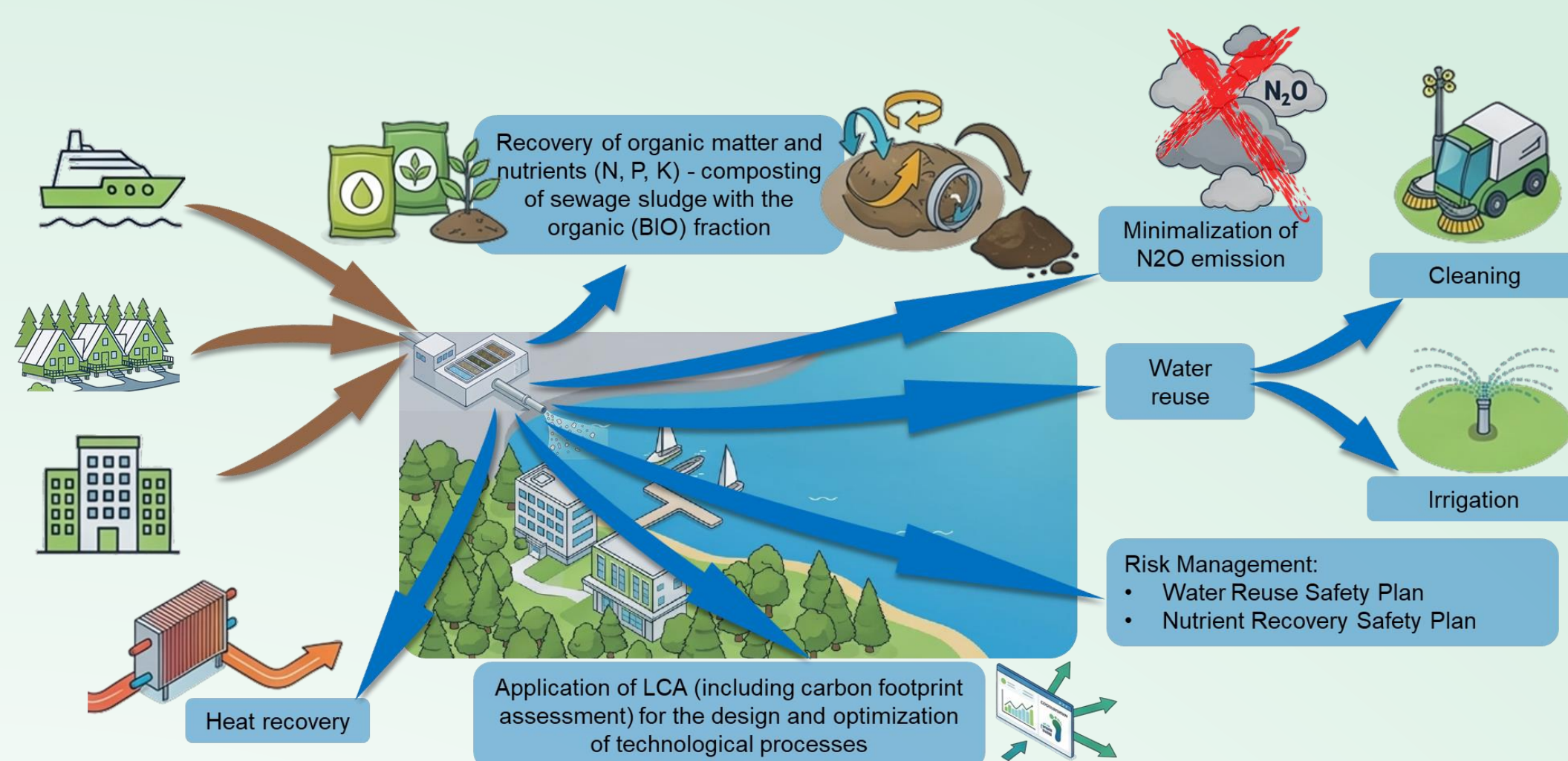
In recent years, a significant increase in interest in water tourism has been observed. In Poland, this trend is particularly evident in the Great Masurian Lakes region. During the summer season, approximately 80,000 people use recreational vessels in this area. Uncontrolled discharge of sewage generated by such vessels poses a serious threat to the water quality of the lakes. For example, the progressive eutrophication of Lake Beldany has led to a reduction in its surface area from 1,241.6 ha to 944 ha. To counteract these negative impacts, it is essential to develop and implement solutions that enable the collection and treatment of sewage and waste generated by water tourism. This poster presents a concept of a circular system for wastewater and biowaste treatment in waterfront tourist areas.

CONVENTIONAL WASTEWATER TREATMENT PLANT



- Pollutant removal from wastewater
- Discharge of treated effluent to the receiving water body
- Limited recovery of resources
- Release of residual microplastics to the aquatic environment
- Incomplete removal of micropollutants
- Nitrous oxide (N₂O) emissions
- Higher environmental footprint

CIRCULAR WASTEWATER TREATMENT PLANT



- Water reclamation and reuse from at least 60% of the wastewater system (e.g. boat washing, irrigation of green areas, flushing toilets)
- Minimizing the carbon footprint
- Recycling organic and biogenic compounds (composting of sewage sludge, kitchen biowaste, and green matter)
- Heat recovery (heat pump system)
- Risk management
- LCA

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