



**Proceedings
of the International Conference
«European Green Dimensions:
Fundamental, Applied,
and Industrial Aspects»,
June 5–7, 2025**





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The Proceedings covers such questions: European Green deal; Climate change; Energy efficiency, renewable energy; Conservation of biodiversity; Water resources management; Water quality, wastewater treatment; Protection of atmospheric air, environmental control and monitoring systems; Industrial and household waste management; Sustainable development and education for sustainable development.



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Innovative Wastewater Treatment Solutions for Craft Breweries

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Craft brewing has become an important part of the local economy in many regions. However, the expansion of this industry is accompanied by a significant environmental challenge – the treatment of wastewater. Given the limited resources of small-scale breweries and strict environmental regulations, special attention must be paid to effective and economically viable wastewater treatment technologies.

Wastewater from craft breweries is characterized by high concentrations of organic matter, biological oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), and nutrients such as nitrogen and phosphorus. For every liter of beer produced, between 3 to 10 liters of wastewater are generated, often with contamination levels several times higher than domestic sewage [1]. Consider innovative methods of wastewater treatment. Microbial Fuel Cells (MFC). This innovative technology enables simultaneous wastewater treatment and electricity generation. Laboratory experiments demonstrated over 93% COD removal from craft brewery effluent using MFC systems [2]. Constructed wetlands represent an eco-friendly and energy-efficient solution, especially suitable for small or rural breweries. These systems have demonstrated up to 97% removal of BOD and COD [3]. Green Wall Biofiltration Systems. This novel approach combines plant-based filtration with microbial biofilms. Green wall systems achieved up to 78% BOD reduction and are adaptable for urban settings or as pre-treatment before discharge into municipal sewers [4].

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