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Sustainability and Economic Evaluation of Microalgae Grown in Brewery Wastewater

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ABSTRACT

This article evaluates the sustainability and economic potential of microalgae grown in brewery wastewater for biodiesel and biomass production. Three sustainability and two economic indicators were considered in the evaluation within a life cycle perspective. For the production system the most efficient process units were selected. Results show that harvesting and oil separation are the main process bottlenecks. Microalgae with higher lipid content and productivity are desirable for biodiesel production, although comparable to other biofuel's feedstock concerning sustainability. However, improvements are still needed to reach the performance level of fossil diesel. Profitability reaches a limit for larger cultivation areas, being higher when extracted biomass is sold together with microalgae oil, in which case the influence of lipid content and areal productivity is smaller. The values of oil and/or biomass prices calculated to ensure that the process is economically sound are still very high compared with other fuel options, especially biodiesel.

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