Techno-economic and profitability analysis of food waste biorefineries at European level

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Techno-economic and profitability analysis of food waste biorefineries at European level

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Abstract

Food waste represents a potential source to produce value-added materials replacing the use of virgin ones. However, the use of food waste as feedstock in biorefineries is still at an early stage of development and studies assessing its economic viability at large scale are lacking in the literature. This paper presents a techno-economic and profitability analysis of four food waste biorefineries that use wastes from tomato, potato, orange, and olive processing as feedstock. The study includes the assessment of potentially available quantity of those waste flows in Europe. Due to the low technology readiness level of this kind of biorefineries, a screening methodology to estimate the investment and manufacturing costs as well as two profitability ratios (the return on investment and the payback time) was adopted. Results show that not all the waste feedstock have the same potential and that the most profitable options are those related to implementing fewer plants, namely concentrating the production and capitalising on economies of scale.

Keywords: Food waste; biorefinery; profitability; techno-economic assessment; bioeconomy; circular economy

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