

Techno-economic assessment of an olive mill waste biorefinery at different scales

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In this study, an integrated approach has been developed for utilizing Olive Mill Waste (OMW) under the scope of circular economy and sustainable development. Data from lab and pilot scale experiments have been used to design an OMW biorefinery at different scales. We first extracted two high value-added products such as secondary oil and an extract rich in phenolic compounds like tyrosol and hydroxytyrosol. The secondary oil was produced by a hydrothermal hydrolysis while the phenolic compounds were extracted by ultrafiltration and adsorption/desorption with resins. The above technologies were simulated in Aspen plus. All residual streams (solid and liquid) were used as feedstock in a composting process to produce a soil amendment. Finally, a techno-economic study was conducted to estimate all production costs as well as the profitability of the investment at different scales. The zero waste biorefinery that we developed presents a feasible and cost-effective approach by giving added value to OMW.

Keywords: olive mill waste utilization, biorefinery development, techno-economic study