

Investigating the role of biorefineries within the concept of circular economy

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Abstract

Biorefining is the sustainable conversion of biomass into a variety of marketable products and bioenergy. Taken into consideration its potential flexibility, the concept of a biorefinery has emerged as an important strategy for efficiently valorizing the services provided by biomass while minimizing environmental burdens, creating new opportunities for social and economic development, and adapting their expansion and operation to economic conjunctures. One of the most important issues facing biorefineries is sustainability. This work aims to investigate the role of biorefineries in relation to sustainability issues, employing a Greek refinery as a case study. In light of this, various basic biorefinery considerations for waste management are considered including environmental, economic, and social sustainability, technology scenario, economic considerations, production process design, process description, sensitivity analysis, and its applications for various feed-based biorefineries such as sugar, crops and starch, integrated, algal, and so on.

Keywords: biorefinery; waste management; Greece