

LCA of Waste Disposal from Olive Oil Production: Anaerobic Digestion and Conventional Disposal on Soil

Authors : T. Tommasi, E. Batuecas, G. Mancini, G. Saracco, D. Fino

Abstract : Extra virgin olive-oil (EVO) production is an important economic activity for several countries, especially in the Mediterranean area such as Spain, Italy, Greece and Tunisia. The two major by-products from olive oil production, solid-liquid Olive Pomace (OP) and the Olive Mill Waste Waters (OMWW), are still mainly disposed on soil, in spite of the existence of legislation which already limits this practice. The present study compares the environmental impacts associated with two different scenarios for the management of waste from olive oil production through a comparative Life Cycle Assessment (LCA). The two alternative scenarios are: (I) Anaerobic Digestion and (II) current Disposal on soil. The analysis was performed through SimaPro software and the assessment of the impact categories was based on International Life Cycle Data and Cumulative Energy Demand methods. Both the scenarios are mostly related to the cultivation and harvesting phase and are highly dependent on the irrigation practice and related energy demand. Results from the present study clearly show that as the waste disposal on soil causes the worst environmental performance of all the impact categories here considered. Important environmental benefits have been identified when anaerobic digestion is instead chosen as the final treatment. It was consequently demonstrated that anaerobic digestion should be considered a feasible alternative for olive mills, to produce biogas from common olive oil residues, reducing the environmental burden and adding value to the olive oil production chain.

Keywords : anaerobic digestion, waste management, agro-food waste, biogas

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