Optimization of olive oil production plants: the case of Tryfilia, Greece

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***Abstract*—** The olive oil production sector faces many problems in terms of plants' operation, while several environmental problems are also encountered, including the cultivation, harvesting of olives and standardization processes. Furthermore, it has been estimated that the percentages of energy consumption during olive oil production far exceed the permissible limits, thus presenting negative environmental footprint. During recent years, a lot of effort has been put to overcome these issues, providing approaches for the proper management of process residues and energy saving in production plants. Our project aims at optimizing the process of virgin olive oil production by adopting feasible practices that treat with the olive oil production as a whole. Furthermore, principles of Circular Economy are implemented for residues treatment in order to decrease the pollution of the soil, water and air. We also created a model for calculating mass and energy balances (inflows-outflows) at every stage of the process in order to provide the necessary energy for off-grid operation of the unit. Regarding the standardization process, we also propose alternatives to reduce excessive energy consumption and utilize the remnants of the process. Finally, sensitivity of our models on the parameters' values has been examined, as well. In conclusion, the main aim of this work is to propose a sustainable model of rural development in the oil industry, controlling the quality of virgin olive oil and presenting a positive environmental footprint.

***Keywords*—**Olive oil, optimization, production plant, energy wastes.

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