Co-funded by the European Union

ΕΣΠΑ 2021-2027
Βιώσιμη Ανάπτυξη για Όλους
Partnership Agreement 2021-2027

Program "CENTRAL MACEDONIA" 2021-2027
Action: «Innovation Investment Projects»

Project Title:

"Utilization of residues from the production of essential oils and olive oil extracts using hydrothermal liquefaction technology for their conversion into high value-added products – VessOiL"

Description:

The Centre for Research and Technology Hellas participates in the Operational Programme "Central Macedonia" under the ESPA 2021-2027 through the Action "Innovation Investment Plans", co-financed by the European Union and National Funds.

The project titled "VEssOiL" aims to harness the energy potential of the organic load stored in the residues of the essential oils distillation and olive oil extraction industries, through the application of Hydrothemal Liquefaction (HTL) technology. HTL is a method for the production of biocrude (bio-oil) from residual biomass without the need of drying pre-treatment stage.

Indicative anticipated benefits of the project include:

- The development of innovative and sustainable processes and products based on the use of renewable energy sources, aligned with principles of circular economy and waste materials reuse.
- The establishment of a collaborative synergy between the Research Institution and the Industrial Partner to strengthen their interactions, promote the advancement of similar initiatives and extend their overall benefits.
- The reduction of the environmental footprint through the utilization of renewable energy sources, alternative raw material streams and the upgrading of waste destined for landfilling, thus minimizing high disposal costs.
- The creation of new employment opportunities in the fields of waste-to-energy technologies and the alternative energy exploitation.
- Capitalization on the specialized expertise and extensive experience of the project's technical and scientific personnel.
- Economic gains resulting from the exploitation of value-added products and the avoidance of waste management expenses.

Key project objectives include:

- The conversion of agricultural residues – whose disposal imposes increasing economic and operational burdens on enterprises and public authorities – into biocrude and other valuable materials, revealing new economic opportunities through their utilization or resale.
- The process up-scaling initially employing a 250 mL reactor and subsequently progressing to a ~2L reactor, following an extensive study to determine the optimal processing conditions for various feedstocks. Furthermore, the incorporation of catalysts – based on recent literature – aims to significantly enhance the process efficiency.

- Experimental investigation into the use of Concentrated Solar Technologies as the reactor heating means for selected feedstock and conditions, through existing lab-scale infrastructure (Solar Simulator, Solar Furnace).
- Knowledge transfer and network building between the Research Institution and the Industrial Partner, promoting the co-development of new or enhanced products and processes that address emerging needs within the framework of the circularity and sustainability. The proposed technology is expected to act as the basis of future knowledge dissemination and establishment of collaboration networks in the fields of technological innovation and eco-innovation.
- The promotion of a circular economy environment by valorizing, recycling or reusing discarded materials, reducing the carbon footprint, and supporting the development of energy-autonomous units and communities. In the long term, the project's benefits are going to extend to society at large, demonstrating significant economic and environmental impacts.
- Dissemination of project results to relevant stakeholders and interested enterprises through targeted communication and knowledge-sharing activities, with the strategic aim to facilitating the development and market introduction of innovative products and processes.

Total Project Budget: 315.310,00 € (ΔΔ: 291.390,00 €)
CERTH Budget: 195.710,00€