

SUPSI

DEMETO

Modular, scalable and high-performance depolymerization by microwave

The problem

Nowadays, Polyethylene Terephthalate (PET)-based waste streams are mainly treated by means of mechanical processes, aimed at recovering plastic solid waste (PSW) for re-use; because of the degradation and heterogeneity of PSW, only single-polymer plastics can be processed, thus excluding all the more complex and contaminated waste.

The project

The core mission of the project is to enable chemical de-polymerization of PET at industrial scale thanks to its microwave-based process intensification, closing its life-cycle through a circular economy value chain, reducing plastics market dependency from natural resources and im-

proving drastically the environmental footprint of PET production by revolutionizing the paradigm of its recycling, while increasing productivity through a continuous process (instead of the batch ones typical of the industrial state-of-the-art). Contribution of ISEA is in the domain of control algorithm and of power microwaves.

The result

Thanks to a process intensifying approach based on innovative usage of microwave radiations, DEMETO's recycling technology will provide an indefinite life to PET, allowing to come back to its composing elements (Ethylene Glycol, EG, and Terephthalic Acid, PTA) without degrading the materials and, consequently, paving the way for a disruptive, large-scale circular economy for plastic products.

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Partners

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Research domain

- 3 Innovative products and processes
- 4 Global markets, innovative business models and sustainable economic development

