



CE-SPIRE-10-2018

iCAREPLAST

Full Title: Integrated Catalytic Recycling of Plastic Residues Into Added-Value Chemicals

Aim:

Approximately 70% of European plastic waste (18.5 mt/year) is not being recycled due to technical or economic reasons and are thus sent to landfill (27%) or incinerated (42%). This situation affects negatively the environment in terms of pollution and greenhouse gases emissions, as well as social perception regarding waste management, consumer's products industry and policy makers.

iCAREPLAST addresses the cost and energyefficient recycling of a large fraction of today's non-recyclable plastics and composites from urban waste. Heterogeneous plastic mixtures will be converted into valuable chemicals (alkylaromatic) via chemical routes comprising sequential catalytic and separation steps. This multistage process will also yield carbon char and a pure CO2 stream as products, whilst it will present improved economic sustainability, operational flexibility and lower CO2 footprint thanks to (i) the energetic valorisation of gas byproducts through innovative oxycombustion units integrated with efficient heat recovery; and (ii) the use of AI predictive control and real time optimisation. iCAREPLAST aims to demonstrate (TRL-7) the whole technology for plastic waste valorisation in a pilot plant able to process >100 kg/h of plastic. Advanced upstream waste sorting, pre-treatment and pyrolysis is strongly backed by previous demonstration activities and knowhow of the consortium, with profound knowledge of waste management and recycling market.

Concept:

iCAREPLAST solution will enforce circular economy by substantially increasing the amount of recycled plastics to produce commodity products that can be used for virgin-quality polymers production or as raw materials for other processes in petrochemicals, fine chemicals, automotive and detergent/surfactants industries. As a result of its initial exploitation we will treat 250,000t of plastic waste which otherwise would have become landfill, converting it into 1,500t of alkylaromatics and 1,000t of aromatics.

Start date: 15/10/2018

End date: 14/10/2022