CE-SPIRE-10-2018

POLYNSPIRE

Full Title: Demonstration of Innovative Technologies towards a more Efficient and Sustainable Plastic Recycling

Aim:

The main objective of POLYNSPIRE is to demonstrate a set of innovative, cost-effective and sustainable solutions, aiming at improving the energy and resource efficiency of post-consumer and post-industrial plastic recycling processes, targeting 100% waste streams containing at least 80% of plastic materials. To this end, three innovation pillars are addressed at TRL7: A) Chemical recycling assisted by microwaves and smart magnetic catalysts as a path to recover plastic monomers and valuable fillers (carbon or glass fibres), B) Advanced additivation and high energy irradiation to enhance recycled plastics quality and C) Valorisation of plastic waste as carbon source in steel industry. Innovations A and B can lead up to 34% of fossil fuel direct reduction for PA and 32% for PU. Approach C can lead to reductions of around 80% of fossil carbon sources in electric arc furnaces. The demonstration is completed by the performance of a rigorous holistic environmental and economic analysis (LCA and LCC) to ensure the industrial feasibility and the accomplishment of environmental restrictions. Efforts are dedicated to analyse non-technological barriers (legislative or standardization) that could hinder the proper innovations deployment.

Concept:
POLYNSPIRE also implies the development of a comprehensive business plan, gathering 7 business models and establishing a cross-linked relation between plastic, chemical and steel manufacturing industries. Its consortium, coordinated by CIRCE, ensures POLYNSPIRE success through the involvement of 4 RTOs, 1

university, 9 large companies, 6 SMEs and 2 multiplier associations. To that end, chemical companies (REPSOL QUIMICA, ARKEMA, NOVAMONT, NUREL and KOR), plastic compounders (BADA) and converters (MAIER), waste managers (IDS), technology developers (CIRCE, NIC, ION, AITIIP, TUe, CSM), equipment and steel manufacturers (FM, CPPE, HTT, FENO), exploitation (VTG), standardisation (DS) and dissemination (EUPC and IKMIB) entities are involved in the consortium.

Start date:
01/09/2018

End date:
31/08/2022