

Closing the loop of new circular materials: the Waste End project

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Circular Economy (CE) aims to recover (and remarket) materials from residues to decrease the use of non-renewable resources while minimising long term emissions from waste landfilling. To achieve this purpose, the recycled materials must first undergo a specific assessment, the so-called “End-of-Waste” (EoW) procedure.

The *Waste End project* will focus on the proposition of EoW criteria for specific recycled/upcycled waste materials. Dedicated experimental activities have been designed together with optimized analytical techniques to build basic knowledge covering all the aspects of material characterization: chemical, physical, structural and morphological characterization, aimed at assessing the features of identified materials, both before and after recycling and after usage-driven weathering and degradation; environmental characterization, aimed at investigating the behaviour of the recycled materials in the ecosystem and the possible effects of their chemical composition, both in terms of regulated substances and chemicals of emerging concern; materials degradability assessment to estimate the duration and the performance of the material for its second life and propose End-of-Life processes to manage them as waste.

Furthermore, the Life Cycle Thinking (LCT) approach will be adopted to analyse the identified recycling processes: LCA, LCC, and S-LCA will be performed on recycled materials including impacts from their “second life” (i.e., recycling, use and final fate), to fully assess their circularity and convenience. For the same processes, the project will finally develop indicators of Industrial Symbiosis and circularity, starting from the analysis of real industrial contexts. Depending on the types of EoW materials investigated in the project, different situations of symbiosis will be simulated and the environmental benefits deriving from the implementation of symbiosis, facilitated by EoW, will be calculated.