Abstract Template

Abstract Title: Green, circular, bio-economy: baseline evaluation of different plastic packaging products

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Abstract (not more than 300 words)

Plastic packaging sector is continuously facing new challenges with the aim of being more environmentally friendly and efficient with less dependency of fossil fuel. To this end, different strategies can be applied focused on developing, testing and validating better system-wide economic and environmental outcomes fostering circular economy premises. Some promising innovations are focused on i) decoupling the chain from fossil feedstock by using alternative renewable feedstock for the production of bio-based material, ii) creating innovative formats and testing materials with improved recyclability and end-of-life scenario (EoL), iii) promoting an effective after-use plastic economy by means of multisectorial cascaded recycling.

In this vein, the value chain of different packaging products will be improved: plastic bottles for liquid detergent, laminated cardboard packaging for powder detergent, food trays, plastic film for absorbent hygiene products, plastic bags and coffee capsules. These value chains will be improved by any of the aforementioned innovations (using alternative feedstocks, eco-design, or recycling at EoL), which can also be combined for higher benefit in the overall value chain.

In order to evaluate environmentally the improvements achieved by those innovations, the baseline has been characterized under the life cycle assessment perspective paying attention to different steps and relevance of those in the overall value chain. In this vein, the interpretation of results allows to identify the specific contribution of different inputs/outputs in the environmental impact of every step of the value chain, so, the relative impact of raw materials, processing and end-of-life has been addressed. Additionally, for products that can be single-used or reusable, the significance of use phase has been taken into consideration. Finally, for higher replicability of

results across Europe, different waste management strategies (EoL scenarios and logistics related to them) have been evaluated and compared.

Keywords—*Packaging, value chain, Life Cycle Assessment (LCA), circular economy, end-of.life scenarios*

Professional Biography (100-150 words)

Dr. Miguel Lomba Huguet is Recognised Researcher (R2) in Process Integration Group of the Energy and Environmental Technologies Area at CIRCE. He gained the Chemistry Bachelor Degree from the University of Zaragoza (2007) and the PhD in Polymer Chemistry from the ICMA Institute (2012). During the PhD he participated as main author in 4 scientific publications and several participations in international congresses. Before the PhD he did a research stay at Philips (Netherlands) and, after the PhD, he has been working in R&D at different companies. In 2012 he started working at the Technology Centre of Miranda de Ebro carrying out management and technical development of R&D projects of FP7 framework. He worked at Henkel developing adhesives with thermal insulating properties where, in collaboration with the team, he got a patent. Afterwards he has been working at plastic converting industries (Velcro and Sphere) carrying out innovation projects at industrial scale.



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