# PlastiCircle: Improvement of the plastic packaging waste chain from a circular economy approach

- **TOPIC**: H2020-CIRC-01:2016. **Project already funded**.
- **Starting date of the project**: 1st of June
- **Available funding for the partner sought**:  359,625.00 €. As Innovation action, the funding covers 70% of the budget.
- **Partner sought:** Industrial partner designer and manufacturer of sorting equipment for plastic waste.
- **Deadline for show interest**: 15th of May.
- **Contact Person**: Oscar Ruiz (Oscar.ruiz@itene.com) and César Aliaga (caliaga@itene.com).

## OBJECTIVE OF THE PROJECT

The **main objective of PlastiCircle is to improve the Circular Economy of Plastics (Closure of the European Plastic Loop).** With this in mind, a holistic treatment process will be developed for the **reintroduction of plastic packaging** to **the plastic value chain**. The PlastiCircle approach is based on innovation in the four stages associated with plastic packaging treatment: **collection, transport, sorting and recycling**

## ROLE OF THE PARTNER SOUGHT:

<u>**Sorting.**</u> To develop, integrate and validate an innovative sorting process for separating plastic waste into the optimal fractions to be subsequently recovered (i.e. PET, rigid PE, PE film, rigid PP, PP film, and plastic mixes). It should be noted that multilayer materials, which are gaining importance in the packaging sector, will be included in the fraction of plastic mixes. The quality of the plastic fractions obtained will be a key issue. The improvements will be based on **optical Near-InfraRed-Hyperspectral-Imaging technology** and specifically on the adaptation of **material feeding system**, **identification ranges** and **ejection systems**. Innovation in sorting will be focussed on the improvement of the **purity of the six plastic fractions** mentioned, and specially the **elimination of PVC and bio-plastics** (increasing plastic fraction which has a negative influence in the recyclability of conventional plastics). **Tera-Hertz imaging** and **hyperspectral snap shooting** will be integrated with this aim.  Moreover, PlastiCircle will also focus on **film sorting** which currently present technical problems on material detection and ejection (separation). Detection problems come from a continuous increase of number of polymers used in the packaging sector, whereas ejection problems come from the material feeding based on conveyor belts (state-of-the-art). This drawback will overcome in PlastiCircle by an innovative system with a **layout based on air-flow** for material feeding and therefore free of conveyor belts.

Currently: Material loss in sorting is 25%[1]. Precision in sorting: 80-95%[2]. Most common separated fractions are PET, rigid PE, and PE films. The PE film fraction has a high percentage of PP film (17%[3]) which restricts its recovery. The final reject fraction (not recovered) has a high percentage of PET (21%), PE (17%) and PP-PE films (23%)[4].

**PlastiCircle Objective: Material loss in sorting <20%. Precision in sorting >95%. Fractions separated; PET, rigid PE, PE film, rigid PP, PP film, and plastic mixes. Rejects in sorted PE film and PP film will be < 5%. The final reject fraction will have a content of PET, rigid PE and PP-PE films respectively lower than 7%, 6% and 8%. Presence of biodegradables and PVC in sorted fractions <0.3%.**

[1] EXPRA, 2014. The effects of the proposed EU packaging waste policy on waste management practice. A feasibility study. Web: http://www.expra.eu/downloads/expra_20141004_f_UGGge.pdf
[2] Heidrich, 2009. Contribution to automate the quality control of sorted polymer fractions in a  lightweight packaging recycling plant. Master Thesis, TU Dresden, Germany, 2009 (in GERMAN).
[3] Own calculation based on characterization data of PlastiCircle partners.
[4] Data collected from characterizations of the reject fracions carried out by PlastiCircle partners.