



### Step 1

Production of high purity thermoplastics using a novel technique based on froth flotation separation in combination with triboelectricity

### Step 2

Automated multi-class sensor-based sorting and separation of Flame Retardant Plastics (FRP) from other recyclable mixed plastics to prevent landfilling of the entire stream.

### Step 3

Recycling of by-product antimony, Sb through catalytic conversion and hydrometallurgy, back to the EEE manufacturing lines.

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# LIFE PlasPLUS

Recycling of high-quality secondary thermoplastics and recovery of critical raw materials from mixed plastic waste in the automotive and electrical and electronic equipment sectors.



## Why is LIFE PlasPLUS important?

Do you know that more than 25 million tons of plastic waste are generated each year in Europe? Can you imagine that only 30% is collected for recycling? Although waste management and recycling are improving in the European Union, we still landfill or incinerate most of the plastic waste, keeping us a long way from a circular economy.

Thermoplastics are one of the two main types of plastics and their overall share in the generated plastic waste have continuously been growing in Europe for the past years. More than 26 million tons were consumed in the European economic sectors in 2016. Some of the largest thermoplastics producers and consumers are the automotive and electronic and electrical equipment sectors which are together responsible for 15% of the total plastic consumption.

LIFE PlasPLUS revisits the concept of recycling with an innovative approach to manufacture brand new products with the objective to minimize downcycling.



## What is LIFE PlasPLUS about?

LIFE PlasPLUS is a project funded under the European Union's LIFE programme for Environment and Resource Efficiency. The project targets an innovative technology challenging the current state-of-the-art recycling process and transforming the current downcycled or landfilled/incinerated waste in high-purity secondary thermoplastics.

LIFE PlasPLUS improves the recycling of high-quality secondary thermoplastics and critical raw materials found in end-of-life vehicle waste (ELV) and waste of the electrical and electronic equipment (WEEE). The three major project objectives are :

- Step 1: Production of high purity thermoplastics
- Step 2: Automated multi-class sensor-based sorting and separation of Flame Retardant Plastics
- Step 3: Recycling of by-product Antimony (Sb) through catalytic conversion and hydrometallurgy

Furthermore, LIFE PlasPLUS seeks to provide a complete solution for the economic recovery of thermoplastics and by-products through transformation in added-value raw materials and products for the automotive and electrical and electronic equipment sectors.

## How is the project making a difference?

Project results will have economic, ecological, and social benefits for the European communities:

- One year demonstration period will result in over 920 tonnes of high-quality thermoplastic recycled product diverted from downcycling; cut over 1 kilotonne CO<sub>2</sub> eq. of greenhouse gas emissions, and save over 600 000 m3 of water and 8 850 MWh of primary energy.
- Continuous plant operation will recover approximately 40% ABS, around 30% PS and 20% FPP regrinds in a purified, market-ready state.
- A validated automatic sorting process which uses artificial intelligence and rapid, non-destructive analytical techniques with a scalable sorting technology which builds a database of plastic compositions and training algorithms.
- Separate approximately 16 tons of flame retardant-containing plastic, leaving 100 tonnes per year of plastic waste which can be further sorted, recycled and used for energy production.
- A first-of-a-kind pilot demonstration of Sb recovery from electrical and electronic equipment derived waste, including extensive product characterisation (Antimony Trioxide -ATO- or Sb<sub>2</sub>O<sub>3</sub>) and validation in flame retardant batches.
- Demonstration products containing at least 40% recycled plastic and recovered Sb.
- Reduce landfilling in Europe – a practice that has been already terminated in 9 European countries and widely discouraged by the EU legislation.

