

Nowadays we can recycle so many materials, but yet some of them, such as heterogenous plastic, present a much tougher challenge. The European Union's action plan for circular economy and the strategy for plastics in a circular economy aim to eliminate waste and maximise value, while protecting our environment.

LIFE PlasPLUS revisits the concept of recycling with its holistic approach to simultaneously close the loop for two traditionally siloed material value chains, plastics and minerals, by producing high purity recycled thermoplastics and antimony. These two materials in high demand, notably for the emerging electric mobility sector requiring the increased use of lightweight materials and flame retardants to, respectively, lower energy consumption and increase fire safety.

WHY IS LIFE PLASPLUS IMPORTANT?

Do you know that more than 25 million tons of plastic waste is 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 of Flame Retardant Plastics 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.

By using secondary thermoplastics instead of virgin material, the fast-growing sectors will limit energy, water, and resource consumption, as well as cut gas emissions while reusing critical raw materials.

SERI PLAST

Campine

PROJECT COORDINATOR

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Step 2: Automated multi-class sensor-based sorting and separation

Step 3: Recycling of by-product Antimony (Sb) through catalytic

LIFE PLASPLUS OBJECTIVES:

Demonstrate the feasibility of recycling 45% of the plastic concentrate into added-value thermoplastic streams by scaling up a new froth flotation/triboelectricity demonstration unit.

- plastic at 250 kg/h.

- soundness of the concept.



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Achieve a scale up of the current prototype from batch production of 150 kg/h with technology readiness level (TRL)6 to pre-commercial level of continuous production at 1 500 kg/h at TRL7. This will process >98%-pure polystyrene (PP), filled polypropylene (FPP) and acrylonitrile butadiene styrene (ABS) regrinds.

Adapt a sensor-enabled separator that can detect flame retardant plastics (FRPs) [250 kg/h throughput] and separate fibre-reinforced

Substitute >40% virgin thermoplastics with secondary ones in three new secondary compounds for the automotive and ÉEE markets.

Validate the quality of the produced compounds in three standard vehicle parts and in flame retardant batches for the EEE sector.

Showcase a closed-loop production for the valuable flame-retardant element (Antimony Trioxide -ATO- or Sb2O3), also validating its flame-retardant performance in recycled plastics.

Conduct life cycle analyses and socio-economic analyses to confirm the environmental benefits and techno-economic

Develop a replication and transfer plan as a sustainable business model for other facilities around Europe.



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