

ULiège announces participation to LIFE PlasPLUS project for the recycling of high-quality secondary thermoplastics and antimony from mixed WEEE and EoL vehicles

Liège, Belgium, March 31, 2020 – The GeMMe Research Unit (UEE/Faculty of Applied Sciences) of ULiège is pleased to announce its participation to the LIFE project PlasPLUS “*Recycling of high-quality secondary thermoplastics and critical raw materials coming from mixed WEEE and EoL vehicles*”, involving a consortium of five leading European complementary partners covering the product value chain from recycling to car manufacturing. The total budget for PlasPLUS is 3.17M€, the EU providing funding for 1.43M€. The project will be developed under the coordination of Comet Traitements S.A. (“Comet”), a Belgian innovative high-growth company processing and recycling shredder residues (SR) which are by-products of the shredding of metallic wastes (End-of-Life Vehicles or “ELV”, Waste Electric and Electronic Equipment or “WEEE” and collected scrap).

Heterogeneous plastic waste is mostly still either landfilled or incinerated. As a result, Critical Raw Materials (CRM) such as Antimony (Sb), a commonly used Flame Retardant (FR) synergist, are permanently lost. Similarly, high-value thermoplastics (PE, PP, ABS, PS) originating from the automotive and Electrical and Electronic Equipment sectors (EEE) are currently being lost, or in the best cases, downcycled. Decreasing the dependence of these fast-growing sectors on virgin plastic through use of secondary thermoplastics, will curb energy, water and resource consumption and will reduce the adverse impacts of landfilling in Europe.

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, 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.

LIFE PlasPLUS is focused on Research and Development (R&D) activities for the economic recovery of thermoplastics and by-products, starting from a heterogeneous mixed plastic feedstock (ELV, WEEE) and resulting in high-quality raw materials for the automotive and EEE sectors. Previously downcycled or landfilled/incinerated waste will be transformed through three successive steps:

Step 1 : Production of high purity thermoplastics

Step 2 : Automated multi-class sensor-based sorting and separation of Flame Retardant Plastics (FRP)

Step 3 : Recycling of by-product antimony (Sb) through catalytic conversion and hydrometallurgy

ULiège will lead Step 2 by demonstrating at TRL 7 a multiclass sensor-based robotic and pneumatic sorting prototype for the extraction of brominated and antimonated plastics. In Step 3, ULiège will contribute to the char treatment and will produce industrial grade antimony (Sb_2O_3) from the char through a hydrometallurgical route.

ULiège will participate to the LIFE PlasPLUS project through its GeMMe Research Unit specialized in georesources, mineral engineering and extractive metallurgy. The GeMMe consists in a unique Belgian research group contributing to the development of innovative processes for an efficient management of mineral and metallic resources. The GeMMe provides unparalleled experience in urban ore characterization and processing (with a focus on innovative sorting techniques and hydrometallurgy) derived from a long research tradition in primary ores mining and processing.

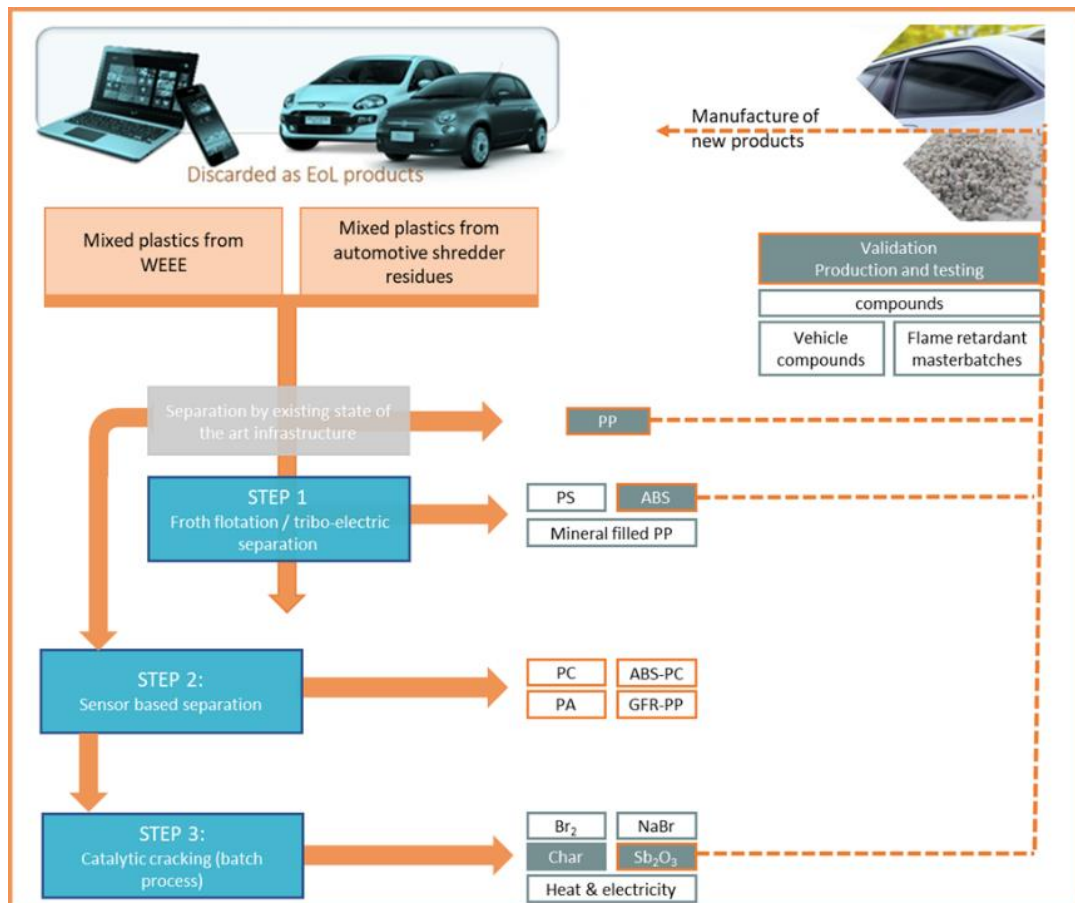
Comet and the GeMMe have developed a long-standing collaboration, notably focused on the industrialization of post-shredder processes for the recovery of non-ferrous metals, minerals, iron oxides, plastics and precious metals. This collaboration was highlighted in the Reverse Metallurgy

Walloon regional program during which specific R&D in the field of smart sorting and hydrometallurgy was upscaled to the piloting stage with the PICK-IT and BIOLIX projects respectively. In parallel, Comet and the GeMMe are continuing to work on additional hydrometallurgical processes aimed at recovering metals contained in printed circuits boards or extracting rare earths used in the magnets of electric car engines. The valorisation of thermoplastics and antimony in the LIFE PlasPLUS project represents yet one more step in this direction.

LIFE PlasPLUS Project Partners

	COMET TRAITEMENTS (BE)
	SERI PLAST (IT)
	CENTRO RICERCA FIAT (IT)
	CAMPINE (BE)
	UNIVERSITE DE LIEGE (BE)

LIFE PlasPLUS Project Work Flow



The participation to the LIFE PlasPLUS project marks a further significant milestone in the long term development plan of the GeMME and ULiège in the field of recycling and CRM. Back in 2013, ULiège and the GeMME were first instrumental in developing « Reverse Metallurgy », a EUR 60 million major Belgian circular economy project focused on metals linking industrial and academic partners within a Regional Technological Innovation Partnership to improve the recovery of metals from end-of-life products and complex raw materials. At the European level, ULiège has been a Core Partner of the EITRawMaterials and actively involved in several education and upscaling projects since 2015. In 2018, ULiège joined the EU H2020 TARANTULA project consortium for the recovery of Tungsten, Niobium and Tantalum as by-products in mining and processing waste streams.

The LIFE PlasPLUS project activities will be carried out over a 3.5 year time frame. Following systematic research and innovation activities at lab scale, the technologies will be brought to TRL7. Compounds, products and parts manufactured with recycled thermoplastics and antimony will be validated by industrial partners in the automotive and flame retardant industry respectively.

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LIFE PlasPLUS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No LIFE18 ENV/BE/000368. The present communication reflects only the author's view and the EASME Agency is not responsible for any use that may be made of the information it contains.

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