LIFE PST SORT Project

LAYMAN's Report

September 2021

Demonstration of a Post-Shredding Technology (PST) for the recovery of raw materials from Automotive Shredder Residues

LIFE Agreement

Title: Demonstration of a Post-Shredding Technology (PST) for the recovery of raw materials from Automotive Shredder Residues

Agreement number: LIFE17 ENV / ES / 000168

Beneficiary: Calaf Tècniques Industrials S.L.

Project duration: 01 Sept. 2018 - 31 Oct. 2021

Project budget: 1,529,233 €

Project location: Calaf, Barcelona, Spain

This project has received funding from the European Union's LIFE research and innovation programme under grant agreement No LIFE17 ENV/ES/000168

The LIFE PST SORT project consists of the development and demonstration of an innovative sorting solution aiming to recover recyclable materials from Automotive Shredder Residues (ASR) of end-of-life vehicles (ELV), which are mostly landfilled or incinerated

End-of-life vehicles waste: A global issue

Some **40 million** end-of-life vehicles (ELVs) are treated worldwide each year, with an average weight of **1.05 tonnes** per vehicle, of which approximately **22 to 25% corresponds to after-shredding residues** (ASR, also known as "automotive shredder residue").

ASR is a highly heterogeneous mixture of metals, plastics, glass, sand and gravel, rubber, textile and fibre material, wood, fines, etc.

In Europe, after the de-pollution and dismantling of end-of-life vehicles, **6 million** vehicles are shredded per year, and close to **1.5 million tonnes per year of shredding rejects (ASR) are sent to landfill or incinerated.**

An innovating sorting solution

The LIFE PST SORT project has been developed from the end of 2018 to 2021, including the design, construction and operation of a demonstration plant located in Calaf, Barcelona (Spain).

The demonstration plant has an industrial throughput of up to 8 t/h, is fully automated and uses machine vision and artificial intelligence for the detection and sorting of recoverable waste.

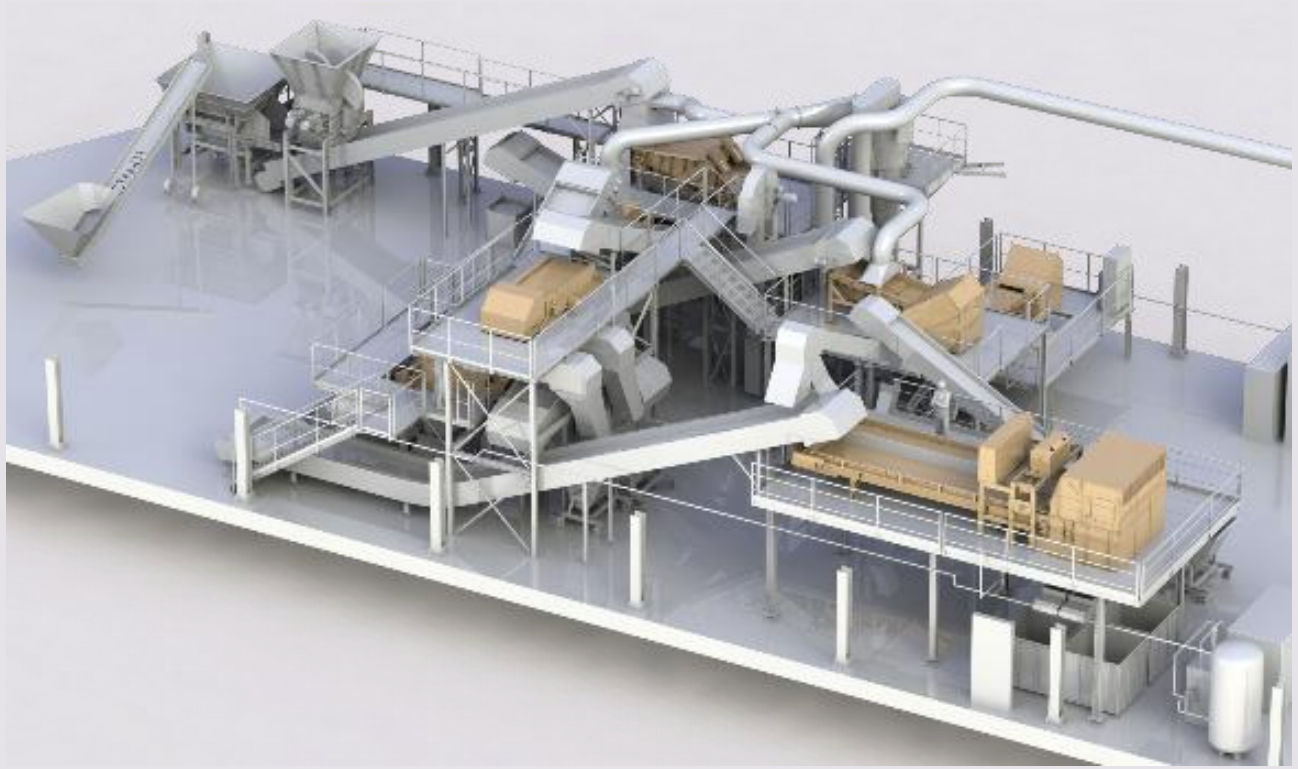
The demonstration plant covers an area of 1,000 m2, 10 metres high, comprising different types of sorting: mechanical (screening, densimetric separation), induction and machine vision (including Deep Learning).

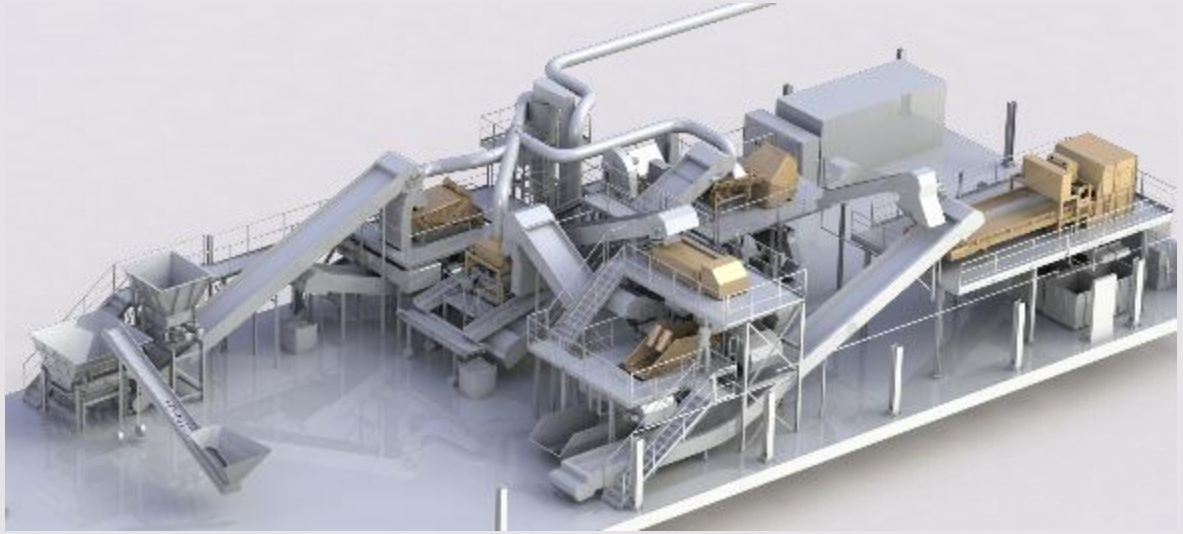
Project objectives

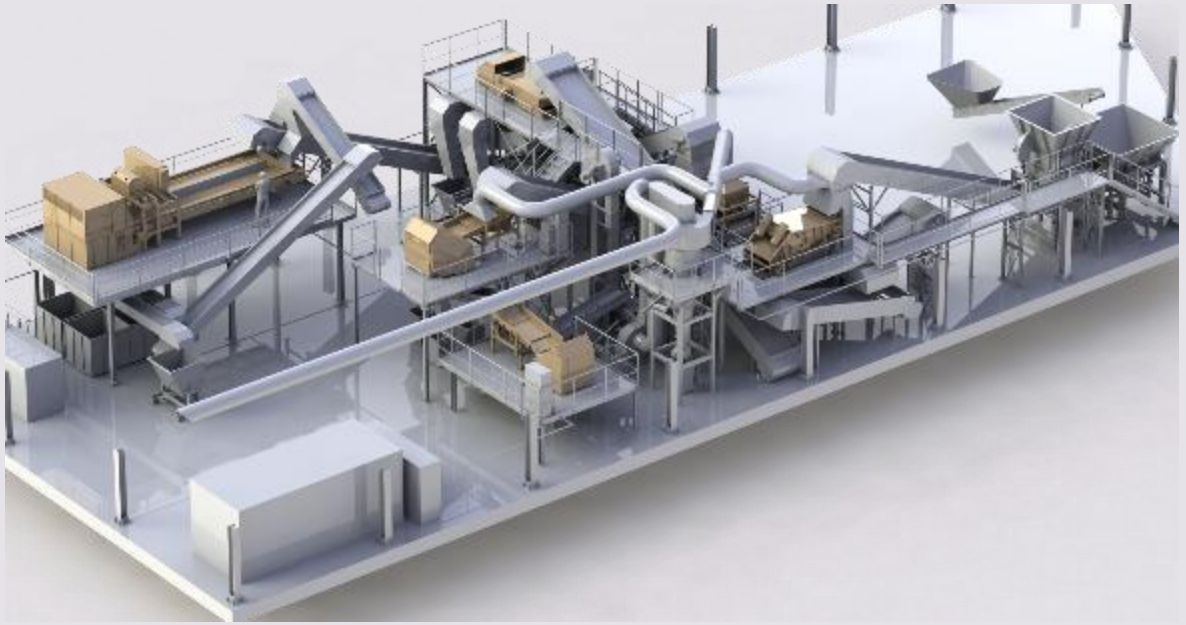
- New industrial recycling solution: Procurement of a technological solution to increase the recovery performance of ELV waste and to avoid, as far as possible, the landfilling or incineration of recyclable materials, by contributing to the achievement of the 2015 targets of the Directive 2000/53/EC (ELV Directive). The LIFE PST SORT solution aims to increase the recycling rate of the overall ASR stream and contribute to the EU's Circular Economy Strategy as well as to the automotive industry sustainability.

- Demonstration of replication appropriate to market conditions: Validation of the industrial-scale sorting capacity of the LIFE PST SORT solution with different types of ASR and other waste streams, recovering metals, plastics, glass, printed circuit boards, rubber, etc. Evaluation of the feasibility for full-scale application of the LIFE PST-SORT system, inviting relevant stakeholders to assess the operational capacity of the solution. Elaboration of business models for adequate close-to-market strategies to approach the European market.

Layout

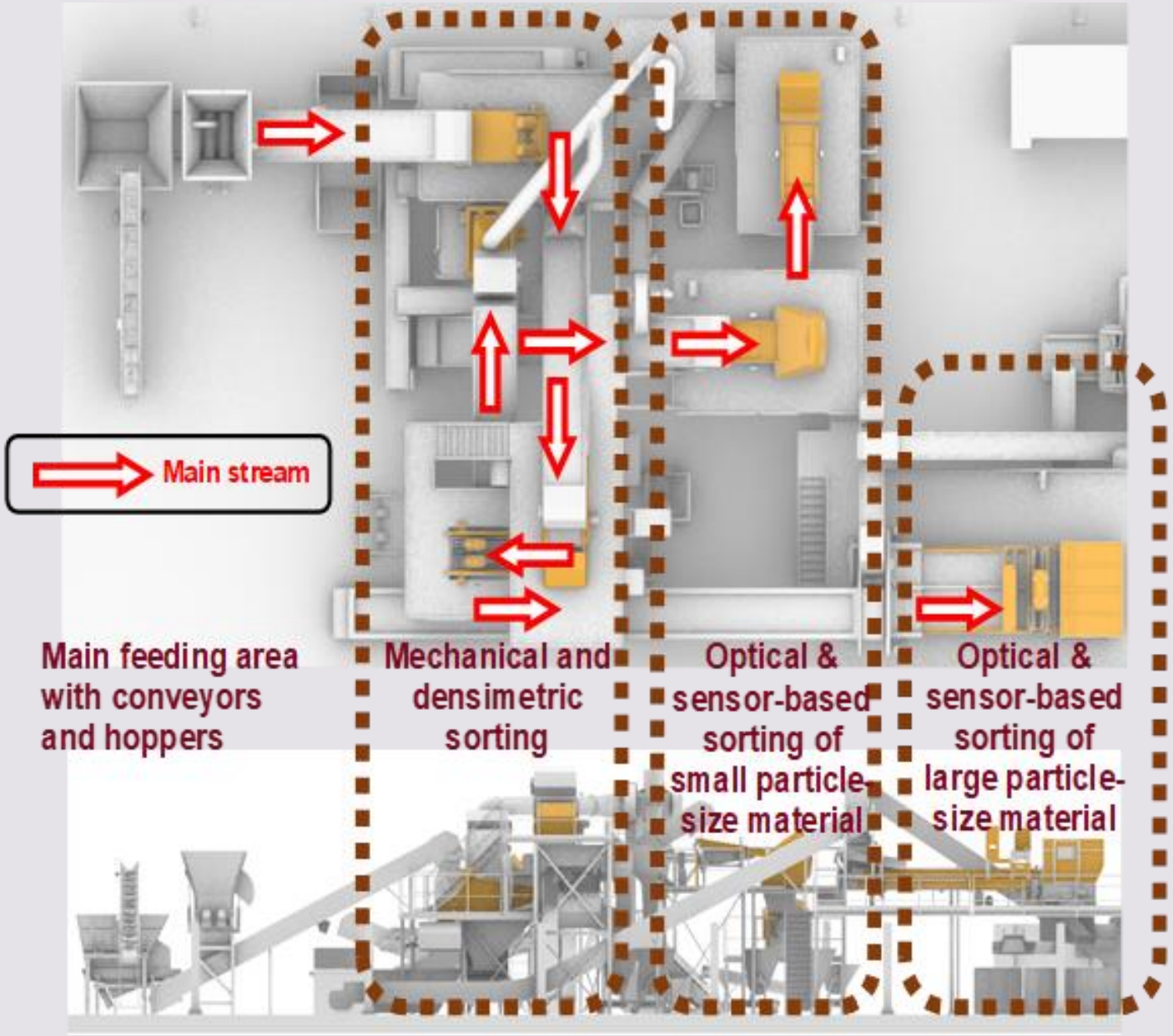






Layout

Machine vision and artificial intelligence technology enables recyclable materials to be recognised and extracted on conveyor belts moving at 10 km/h, obtaining recovery levels of up to 65% to 70%. The main materials recovered are plastics, metals, rubber, polyurethane foam, textiles, glass, paper and cardboard, wood, electronic components, etc.



Features and benefits of the LIFE PST SORT solution

- The process admits a wide range of feedstocks composed of granular material with different particle sizes.
- The input materials are conveyed to specific process equipment according to their particle size and density, increasing the efficiency of material sorting and recovery.
- Modular solution that may be adapted to almost all types of existing recovery facilities.
- It may handle changes in material content of the feedstock.

Features and benefits of the LIFE PST SORT solution

- Totally dry process: no water, no leachates nor juices, without wastewater.
- Fully automated process and no manual handling.
- Replicability for ASR and various other industrial and municipal waste streams.
- Stakeholders may visit the demo plant for validation with their own feedstock.
- Long term environmental and socio-economic benefits

Assessment of the benefit and impact of the LIFE PST SORT solution

Main economic benefits for the users of the LIFE PST SORT solution:

- The sale of waste that has been recovered as valuable materials, recyclables or RDF stream
- The gate-fee and taxation savings derived from the recovery of materials that are not sent to landfill or incineration.

Recovered waste as secondary raw materials and RDF (traded in Europe) including a gate-fee earning / economy may result on an **average revenue of 77.4 €/t** expressed in terms of tons of feedstock (conservative values ranging from 57.4 €/t to 97.5 €/t). **Capital cost** (CAPEX) for the baseline solution corresponds to **1.37 M€.** The addition of investment annuities and Opex results on an **annual cost average of 62.8 €/t** (in terms of tons of feedstock), varying from 55.6 €/t to 69.9 €/t. Operating costs (OPEX) include maintenance staff, electricity consumption, mobile equipment costs, maintenance of process equipment, costs of rejects, overheads. By this way, the payback period may vary from 1.5 to 6 years.

Assessment of the benefit and impact of the LIFE PST SORT solution

The main environmental impact of the LIFE PST SORT solution concerns the reduction in greenhouse gas emissions. The total reduction of the global warming indicator with the new sorting technology is 3.4 tonnes CO2-eq per tonne of ASR treated, compared to the landfill impacts of the entire ASR stream, and 4.4 tonnes CO2-eq per tonne of ASR treated, compared to the incineration impacts of the entire ASR stream.

The LIFE PST SORT solution provides positive impact for the EU's sustainable growth strategy, facilitating the overall sustainability objectives of the industrial activity and job creation in Europe.

Replication of the technology solution concerns rejects (ASR) and materials issued from end-of-life vehicles (ELV). Transferability of the project results is focused on waste of electric and electronic equipment (WEEE), incineration bottom ashes (IBA), glass waste, and refuse streams from treatment plants of municipal solid waste (MSW) and industrial & commercial waste streams.

Communicating project results

- Professional networking
- lifepstsort.eu website
- Videos
- E-newsletters
- Social media networks
- Report publications
- Information leaflets
- Press releases

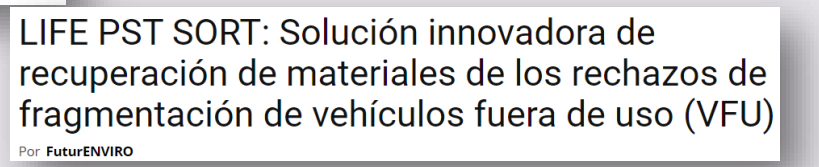
The primary target audience is constituted of ELV shredding and PST companies of ELVs; Recycling companies; Waste management companies; Professional associations. The target audience of this project also corresponds to Research and technology centres; Universities and Educational centres; Local authorities; General public.


Inversión de 1,5 millones de euros

CALAF GRUP La compañía ha culminado una inversión cofinanciado por la Comisión Europea de 1,5 millones en el proyecto Life Pst Sport. Calaf Grup espera que esta tecnología generará entre 50 millones y 100 millones de ingresos anuales en el sector del reciclaje.


Expansión
1986 | 2021 35 ANIVERSARIO
Cataluña


FuturENVIRO
PROYECTOS, TECNOLOGÍA Y ACTUALIDAD MEDIOAMBIENTAL
ENVIRONMENTAL PROJECTS, TECHNOLOGY AND NEWS


LIFE PST SORT: Solución innovadora de recuperación de materiales de los rechazos de fragmentación de vehículos fuera de uso (VFU)
Por **FuturENVIRO**


EL PUNT AVUI+


El valor d'un cotxe quan es fa miques

- El projecte europeu LIFE PST-SORT, assumit per la catalana Grup Calaf, introdueix una tecnologia més eficient de reciclatge dels residus de l'automòbil

Find out more

For further information, or to access the project's information, visit the **lifepstsort.eu** website or e-mail us.

E-mail: **info@picvisa.com**

Address: **Isaac Newton, 2 - 08280 Calaf, Barcelona (Spain)**

Telephone: **+34 93 868 08 45 / +34 607 33 24 84**

Project site and location of the demonstration plant: