PROJECT

POLREC

AWARDED PROJECTS

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Awarded projects

Sub-Grant requested	Company Name	Country	Amount requested
Mechanical recycling sub-grant	Recyouest	France	30 000 €
	GAVIPLAS, S.L.	Spain	30 000 €
	CAMY SAS	France	28 500 €
	ALTHEORA	France	9 000 €
	OSTIUM	France	21 400 €
	Earth Protex Portugal	Portugal	30 000 €
	SPORTS CARBONE	France	28 400 €
	Rezero	Ireland	30 000 €
	José Combalía, S.A.	Spain	29 317 €
	Total Plastic Solution	Ireland	30 000 €
	Berbetores Industrial S.L.	Spain	30 000 €
	Pdc-plast	Denmark	25 000 €
	Mälarplast AB	Sweden	25 000 €
Digitalization sub-grant	Maxiplás - Plásticos & Engenharia	Portugal	20 000 €
	OSTIUM	France	20 000 €
	GAVIPLAS, S.L.	Spain	20 000 €
	Revival	France	20 000 €
Chemical recycling sub-grant	ECOLLANT	France	24 900 €
	QEV TECHNOLOGIES, S.L.	Spain	30 000 €
	José Combalía, S.A.	Spain	29 990 €
	IMDEX	Denmark	30 000 €
	AGON A/S	Denmark	30 000 €
	MACHAON SAS	France	30 000 €
	Earth Protex Portugal	Portugal	30 000 €
	DLYTE CHEMICALS, S.L.	Spain	30 000 €

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Awarded Chemical Recycling Projects

Beneficiary	Project	Objectives
ECCOLANT, France	**ECOLLANT - chemical recycling of nylon from tights in a circular loop** On average, tights are made of 85% nylon (polyamide - PA66) and 15% elastane (polyurethane – PU).	Its aim is to recycle non-recyclable end-of-life textiles into new textiles using innovative processes developed in the laboratory. Two routes are currently being explored: A chemical route using clean solvents, and an enzymatic route.
MACHAON SAS, France	**RePlastify - Development and optimization of pyrolysis for the valorisation of the complex polymeric rejected waste**	The main objective of RePlastify is to obtain "zero waste" in the recycling of post-consumer plastic waste that allows the valorisation of complex polymeric rejects from mechanical recycling plants of low-density polyethylene (LDPE). Fully implemented the potential is enormous. In 2020 in Europe, approximately 1.5 million tons of LDPE and LLDPE waste were sent to recycling plants, being possible to recycle 0.82Mt. The project aims to revalue the fraction that is not currently possible to treat, reducing 0.68Mt of waste that ends up incinerated or in landfills.
QEV TECHNOLOGIES, Spain	**QEV TECHNOLOGIES - Recycling of competition cars and manufacture of parts for luxury cars** The technology to be used is the R3FIBER process based on the thermo-chemical treatment of carbon fiber waste composite materials. In an initial phase, the composites are pyrolyzed in the reactor by applying different heat cycles at a certain temperature. A second cleaning phase is carried out that allows obtaining high quality recycled fibers free of resins.	The project will have a special impact on the reduction of CO2 emissions that are currently being emitted in Europe. This reduction arises from the use of a new range of recycled fibers producing no emissions to replace traditional fibers producing emissions. To produce virgin carbon fibers, it is necessary to expose the carbon to a temperature of 1,200 C. During this process, high CO2 emissions are generated. The production of one kilo-gram of carbon fiber generates 21.3 kg of CO2 emissions. Taking into account that the global consumption of carbon fiber is around 170,000Tn, the CO2 emissions emitted reach astronomical figures (170,000tn *21,300 CO2/Tn = 3,621M CO2).
José Combalía, Spain	**Chemical recycling of polyolefins to obtain high value-added dicarboxylic acids** The service provider ONYRIQ has developed a new chemical recycling technology: CYCLOPS, a more economical, scalable, and sustainable method of chemically upcycling polyolefins, able to produce high-value goods like dicarboxylic acids.	The objective to increase the amount and kind of recycling materials from the existing elastomer residue of crown cap liners to include the remainder of the polyolefin family (PE and PP). It is estimated that every ton of waste polyolefin can be valorised into 0.6–0.7 Tn of dicarboxylic acids, which can be sold for between 2-25€/kg.

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DLYTE CHEMICALS, S.L., Spain	**Chemical recycling of dry electrolytes** Electrolytes are used as consumables in the electropolishing processes of DLyte® technology. This electropolishing process consists of a selective removal of metallic ions from metal surfaces to be polished. These ions are captured by the particles that form the dry electrolyte. After hours of use, these particles become saturated, and must be re-placed. Currently, these saturated electrolytes are managed as waste.	Currently, the user of the electrolyte, once it reaches the end of its useful life, must manage it with an authorized waste manager in accordance with the regulations in force in their country. Future scenario: The spent electrolyte is not sent to a local waste manager but is returned to the DLyte Chemicals facilities to be recycled and transformed into new electrolyte. For a recovery volume of 30K L/year, the savings cost would be around Euro 30K per year.
IMDEX A/S, Denmark	**IMDEX - Recycling of End-of-Life Tires (ELTs) in collaboration with suppliers, service-provider, and end-users.** Technology used: Pyrolysis undertaken by Waste2Value.	The objective is to avoid incineration of the 45.000 tons of ELT waste generated in DK every year. A contribution to reduce CO2-emissions from the car industry and create a more circular and more environmentally friendly business model.
AGON A/S, Portugal	**AGON – Circular lifting slings** AGON will collect used slings and the service provider Textile Change will process the slings via their 5-step solvent-based chemical recycling method.	The expected output is to verify that Textile Change can make recycled polyester based on used polyester slings and that the recycled material is fulfilling all quality parameters to be used for making new polyester slings. The quantities of used polyester slings are rapidly increasing. In 2028 Agon expect to have around 2,000 tons of used polyester slings annually.
Earth Protex Portugal, Portugal	**Tex2Tex's Cutting-Edge Green Solution - Elastane Dissolution in Advanced Polyester Recycling** This project is centred about the processing of textile waste derived from polyester and spandex fabrics. The process used will be Thermo-Mechanical Reactor recycling. In contrast to chemical depolymerization, which requires subsequent polymerization, this is a purely physical dissolution process.	The objective of this project is to recycle a larger part of the textile waste generated in Europe. In Europe, more than 15kg of textile waste is generated per person each year. Over 65% of our clothing is composed of synthetic materials or a blend of natural and synthetic fabrics.

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Awarded Digitalization Projects

Beneficiary	Project	Objectives
Revival, France	**RTWIN Empower recycling with AI automation** Digitalization of recycling of materials from shoe waste (traceability of materials, compare performance of different recycling pathways)	The objectives are: Development of user-friendly tracking tools enabling customers to monitor their deposits in real time. Structuring data assets, as operations produce vast proprietary data from deposits, industrial processes, R&D, and impact measurement. Efficiently using this data is like a compass in polymer recycling, directing strategies. The objectives will create increase in jobs and income and increased use of recycled rubber materials.
Ostrium Group, France	**Ostrium Group – Application to trace Circular Recycling loop for thermoplastic composite surgical instruments** Development of application to collect and trace polymer waste form healthcare establishments. Specifically, identification of kits by a unique number and then sorted by type of material and how to recycle.	The objective of the project is to reduce the amount of hospital waste, estimated by "ADEME" at 13,000 tons/year (French market only), by providing an application for reliable identification and collection, which will enable hospital polymer waste to be sorted and recycled, as well as identifying the recycled polymers available on the market.
Maxiplás, Portugal	**Maxiplás – Recycling Towards Sustainability** Digitalization of grinding process to provide full traceability, management and data tracking of waste from own injection moulding process. Maxiplás' project will have an impact on waste reduction, improve recycling methods, and introduce a new software solution to the market.	By implementing this project, Maxiplás will pioneer the adaptation of an existing system to a new functionality tailored for the polymer industry, with the potential for scalability. Maxiplás will benefit from this initiative by reutilizing waste and the production costs are reduced. Objectives in 3 years: Reincorporate 50% of the overall waste generated by the activity (10 tons). Track 100% of the wasted raw materials. Reduce global raw material waste to 1,5% (3 tons). Increased profit by reducing non quality costs (800k).
GAVIPLAS, Spain	**GAVIPLAS – New intelligent technology for quality control of recycled plastics** Determination of the quality of recycled plastic using artificial intelligence and analytical data of the material under study.	The main objective is design of an intelligent algorithm that classifies the analytical data from recycled plastics. The expected result at the end of the project is a cutting-edge technological solution that, fed with analytical data from different tests and images performed on the plastic, will be able to determine the quality of the recycled material.

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Awarded Mechanical Projects

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Recyouest, France	**Recyouest – PCE monofilament Feasibility** Knitting of open mesh HDPE bags to avoid the use of plastic bags when collecting agricultural nets. The expected outcome is the feasibility of spinning our rHDPE granule, to enter an iso-functional circular economy. Once the study is completed, it will be possible to envisage isofunctional and infinite recycling of collection bags for materials from the agricultural supply industry.	The primary objective remains the replacement of collection bags for round bale nets, initially in France. This potentially involves 450 k bags/year, representing over 72 t/year of single-use LDPE. Then other European countries will be targeted, such as Luxembourg, which has already ordered 10k bags for the next 3 years.
GAVIPLAS, Spain	**GAVIPLAS - Ink Removal Technology as Novel Technology for food contact applications** The new plastic recycling technology is based on the elimination of surface printed ink and other contaminants on plastics through a water-based decontamination process and closed circuit. The result is a plastic material free of ink and other contaminants, with a quality that makes it suitable for use in food contact applications.	The objective of the project is to obtain: • The authorization of a recycling process as a decontamination process of printed LDPE film. • A recycled polyethylene with food contact grade achieved from this decontamination process. Previous life cycle analysis studies indicate that the production of de-inked pellets generates 0.325 kg CO2 eq, while 1 kg of virgin pellets generates 1.88 kg CO2 eq. In other words, a project with high potential of CO2 savings.
ALTHEORA, France	**ALTHEORA – New recycled composite material** ALTHEORA intends to recycle end-of-life composite cabinets, used to conduct 220 V-current, drinking Water or domestic gas to the houses, flats or plants.	These composite cabinets are made of SMC (polyester/glass fibber and additives like fire retardant or anti-UV). Nearly all these composite cabinets are landfilled today after dismantling. The objective is to obtain a new composite material (containing at least 30% recycled material), that can be processed with the existing moulding facilities. The demand for these CO2 saving products is expected to increase due to the rising demand for electrical charging terminals.

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OSTRIUM, France	**OSTIUM Group - Circular recycling loop for thermoplastic composite surgical instruments** A project in partnership with Cosmolys, a specialist in mechanical recycling of infectious risk healthcare waste, and Solvay, a specialist in production and supply of high-performance polymers, targeting the mechanical recycling of its surgical instruments designed in Ixef® PARA. This composite, consisting of a thermoplastic resin (Polyarylamide) and a mechanical reinforcement 50% filled with glass fiber, is not currently recycled, and represents a technological challenge in terms of mechanical grinding.	In 2022, SOLVAY and OSTIUM declared in a joint statement their common objective of setting up a circular ecosystem designed to enable the mechanical recycling of the Material contained in the after-use/end-of-life surgical instruments. The integration of these eco-design criteria, coupled with product recovery at end-of-life, enables environmental impacts to be reduced by around 50% on numerous target indicators (climate change, use of fossil resources, mineral resources, water use, etc.) compared with a conventional single-use product.
CAMY SAS, France	**CAMY SAS – closed loop recycling of expanded EVA footwear from hospital activity** Recycling a material such as expanded EVA is not so straightforward: This requires a combination of grinding techniques, of compounding set-tings on the twin-screw extruder and of reformulation of the material. It must also be demonstrated that the injection process can produce new shoes from this new recycled material.	The objective is to demonstrate the full circularity of expanded EVA recycled material for the injection moulding of new shoes containing up to 100% recycled EVA. Currently, the potential rate of integration of recycled EVA in a shoe is estimated at 25%. The goal of this project is to reach 100% EVA by multiplying the reintegration loops, thus significantly reducing the use of virgin materials derived from petrochemicals.
Earth Protex Portugal, Portugal	**Tex2Tex FAASST Transformation: Revolutionizing Recycled Synthetic Textiles with Sustainable Surface Treatments** Tex2Tex FAASST stands for Functional and Anti-Shedding Surface Treatments. A surface treatment that enhances mechanical properties and reduces microplastic release in rPET (100% and/or blends) fabrics. It is anticipated that it will introduce new hydrophilic properties and improve dyeing capabilities.	The objective of this project is to transform textile waste into valuable top-tier materials with an eco-friendly approach.

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SPORTS CARBONE, France	**SPORTS CARBONE - Recycling of carbon fiber sports equipment** Carbon fiber sports equipment that can't be repaired doesn't currently have a suitable recycling solution. A recycling solution for carbon fiber bicycles will be sought. Two treatment axes will be explored: The chemical/ mechanical axis via solvolysis and realignment actions of the carbon fiber. The thermal/mechanical axis via vapotermolysis actions and realignment of the carbon fiber.	The objective is to reduce the environmental impact of the equipment at the end of its life. The project will prevent the landfill of approximately 4m3 of carbon fiber sports equipment. The use of recycled carbon fiber is up to 40 times less ecologically impactful than virgin carbon fiber. When scaled up the recycling potential is big.
Rezero, Ireland	**Rezero - recycling of filters from cigarette industry** This project aims to recycle cigarette filters made of cellulose acetate (CA) a natural polymer derived from cellulose (wood). The filters are separated from unused/defective cigarettes. The aim is to produce valuable finished products using the fiber, in the form that it is isolated, rather than using energy and chemical to convert it into pellets and objects made from same.	The objective is to obtain environmental benefits. That is stopping destruction and replacing virgin production. No one else in the world recycles filters from unused defective cigarettes for reuse in sustainable products. The business model is based on the principles of a circular economy – taking a waste material set for destruction and replacing virgin materials with it.
Jose Combalía, S.A., Spain	**José Combalía - Polyethylene in the Loop. All for crown cork process** Crown corks require specific airtight conditions, as they are widely used for packaging carbonated drinks. Therefore, a layer of polymer is incorporated into the caps. The polymer used has a composition of 65-70% LDPE, 25% (SBS) elastomer and (10-5%) additives. Beside this additional polyolefin waste from the packaging step of the final product is generated. In total the amount of plastic waste generated exceeds 15 tons.	The objective of this project is to obtain recycled polyethylene film from waste with a non-negligible amount of elastomer through mechanical recycling. The purpose is to achieve total management of the waste and its reincorporation into the process to achieve zero waste.
Total Plastic Solution, Ireland	**Total Plastic Solution - Transition to a Circular Economy** The aim is to fully understand the effects of recycled addition to their current materials and the effects of various recycled content on end product properties. The project will process various volumes of recycled PC/ABS with virgin material to investigate the effect of recycled plastic on material and final product properties. Moreover, recycling of moist PP powder will be examined.	The objective is that at least a 30% reduction in virgin PC/ABS materials can be achieved without a falloff in product performance. Additionally, reduced drying time and steps for the PP recycled powder will introduce significant energy cost savings for the company which will contribute substantially to a reduction in CO2 emissions.

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Berbetores Industrial S.L., Spain	**BERBETORES INDUSTRIAL – Innovation approach to the Development of additive manufacturing BAAM process by recycling and integration of ABS & HDPE scrap** The main aim of this project is to recycle the scrap generated during the thermoforming processes of Berbetores activities involving two kinds of polymers - ABS and HDPE. By the adaptation of the Big Area Additive Manufacturing processing a second life for the products can be obtained.	The objective of the project is to create a positive environmental impact, as it will use and process 100% of recycled material. In this sense, CO2 emissions will be reduced due to the reduction of use of virgin materials. Furthermore, a positive environmental impact will occur thanks to the reduction of products sent to landfill.
PDC-Plast, Denmark	**PDC-Plast: Production of component in recycled plastics** One such product is golf discs, which are produced from TPU. This product is highly suitable for pro-duction in recycled plastics, as it can be produced in high quality with up to 30% recycled material. The main obstacle currently preventing the manufacturing of the product is adhesion of the plastics to the moulding tools. However, with the ideal surface coating, the demoulding problems that arise from adhesion of the material can be significantly reduced. This solution will be explored through a collaboration with the service provider CemeCon, who will coat the moulds with a physical vapor deposition.	PDC Plast aims to produce 400,000 discs per year, and thereby substantially reduce the consumption of virgin plastics.
Mälarplast AB, Sweden	**Mälarplast – Maximizing sustainability by recycling bioplastics** The product in question is a phone case produced in bioplastics. The manufacturing of this product has shown to be challenging, as the fibers cause significant wear on the moulding tools. Moreover, the company wish to incorporate recycled PLA materials into the product. In this project the prospective of solving these challenges by having our moulding tools coated with physical vapour deposition (PVD) coatings will be addressed.	The objective is to develop a solution for these combined challenges, based on specialized PVD-coatings. To reduce the impact on climate and environment, Mälarplast currently operates with app. 40% bio- and recycled plastics out of their total plastic consumption with a goal to increase this up to 50%, largely by increasing the use of recycled material.

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