

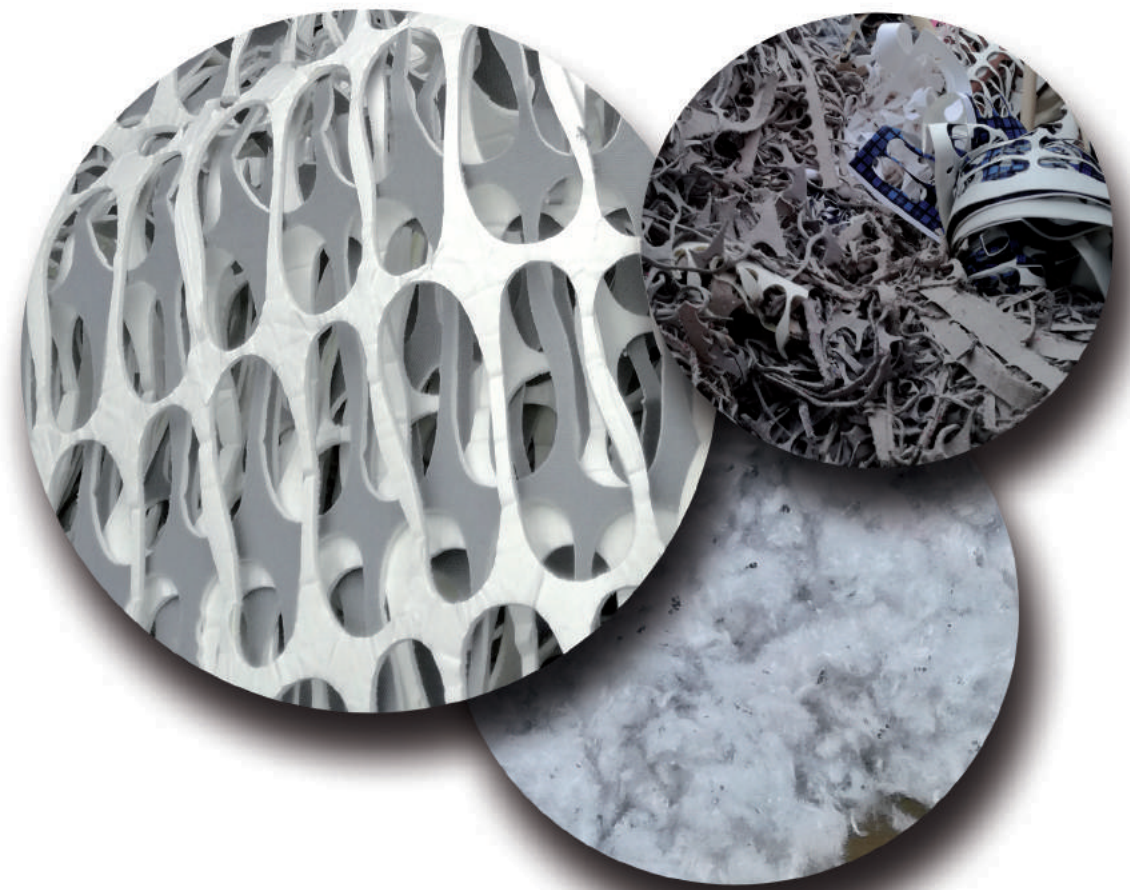


LIFE15 ENV/ES/000658 LIFE-ECOTEX

# Newsletter I: First Semester 2017

## CIRCULAR ECONOMY APPLIED TO POLYESTER TEXTILE WASTES

THIS NEWSLETTER INTRODUCES THE LATEST DEVELOPMENTS OF THE **LIFE-ECOTEX** PROJECT, EMPHASISING DISSEMINATION AND NETWORKING ACTIONS



## PARTNERS



GAIKER-IK4, Technology Centre GAIKER-IK4, recycling technologies experts.



CTCR. Footwear Technology Center of La Rioja, expert in footwear technologies.



BETA RENEWABLE GROUP S.A., is a sustainable company – energy operator.



EKO-REC Ecología, Reciclaje y Medio Ambiente S.A., manufacturer of synthetic textile fibres.



LOGROTEX, manufacturer of nonwoven textile products.





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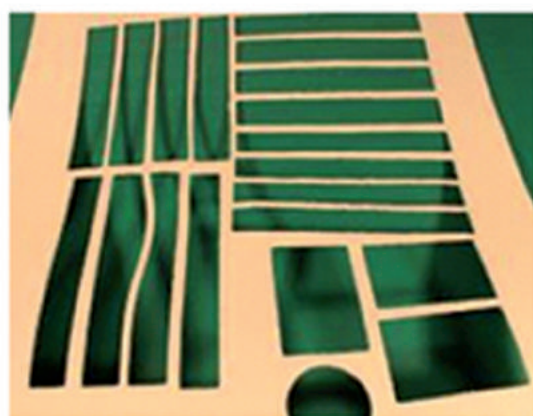
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## CIRCULAR ECONOMY APPLIED TO POLYESTER TEXTILE WASTES

### BACKGROUND

The footwear industry's production processes use large quantities of materials. Among these, textiles and polyester are widespread. Polyester fibre, in particular, is very common for its versatility as a synthetic fibre. It has an excellent crease resistance, keeps its original shape and is soft to the touch, which consumers find very comfortable.

However, this increasing consumption of polyesters in footwear manufacturing generates high levels of material waste. The residues include cuttings and scraps which contain isolated polyester or polyester mixed with other materials. Nowadays, end of life alternatives for this type of waste are either mechanical recycling, which originates very low added-value products or, the most common, landfill dumping. Therefore, LIFE-ECOTEX aims to redress the latter by recycling polyester waste to produce and manufacture new marketable textile products.



Polyester and white fibre trimmings



90% Polyester insoles



100% Polyester insoles



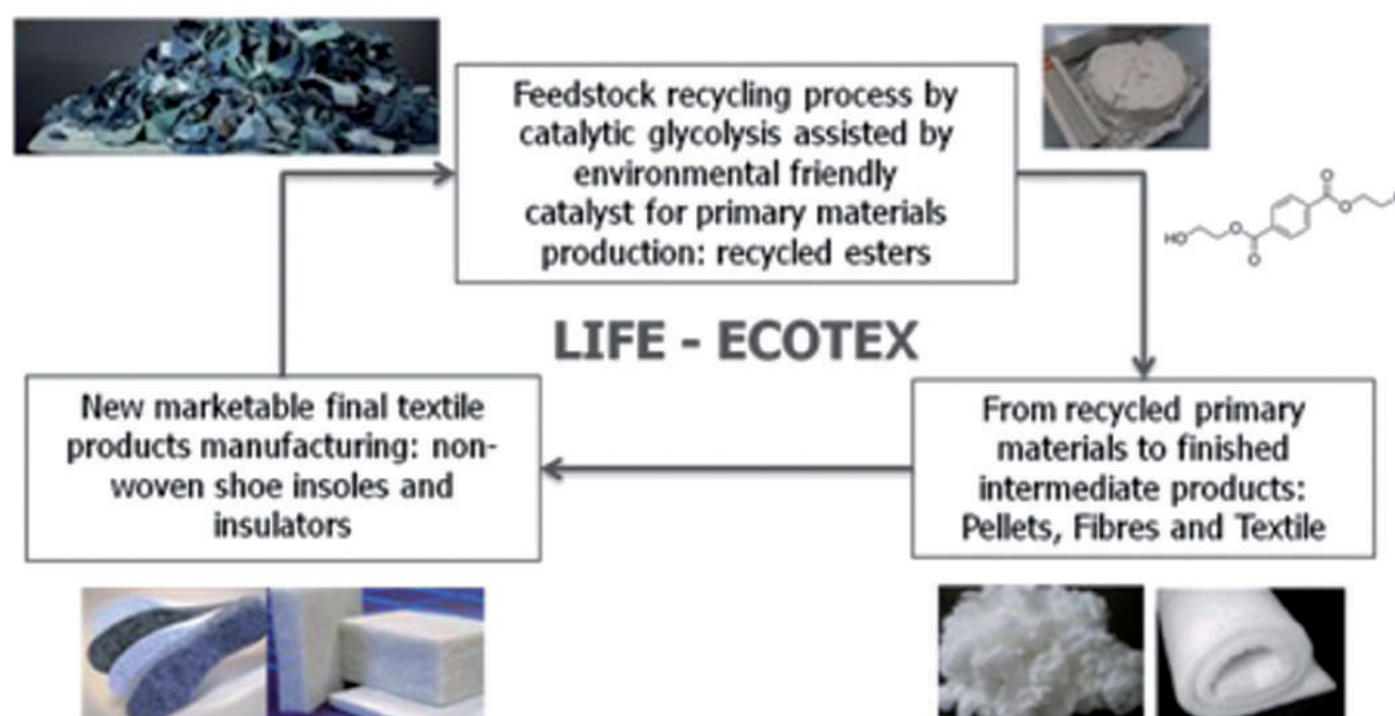
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### OBJETIVES

The **main objectives** of the LIFE-ECOTEX project are to:

- ♻️ Demonstrate how glycolysis chemical recycling of polyester textile waste from footwear manufacturers can be used to obtain high quality BHET monomers.
- ♻️ Demonstrate how to close polyester's life cycle by using the recovered BHET to synthesise new PET for the production of polyester short fibres (PSF), which can then be employed to manufacture nonwoven textiles.
- ♻️ Define possible markets where the new textile products can be incorporated.
- ♻️ Use the Lifecycle Assessment (LCA) and the Cost Analysis (CCV) to lay the foundations for a sustainable and economically viable process.
- ♻️ Develop environmental policy recommendations on the use of chemically recycled polyester in textile manufacturing.
- ♻️ Disseminate project results to key stakeholders.



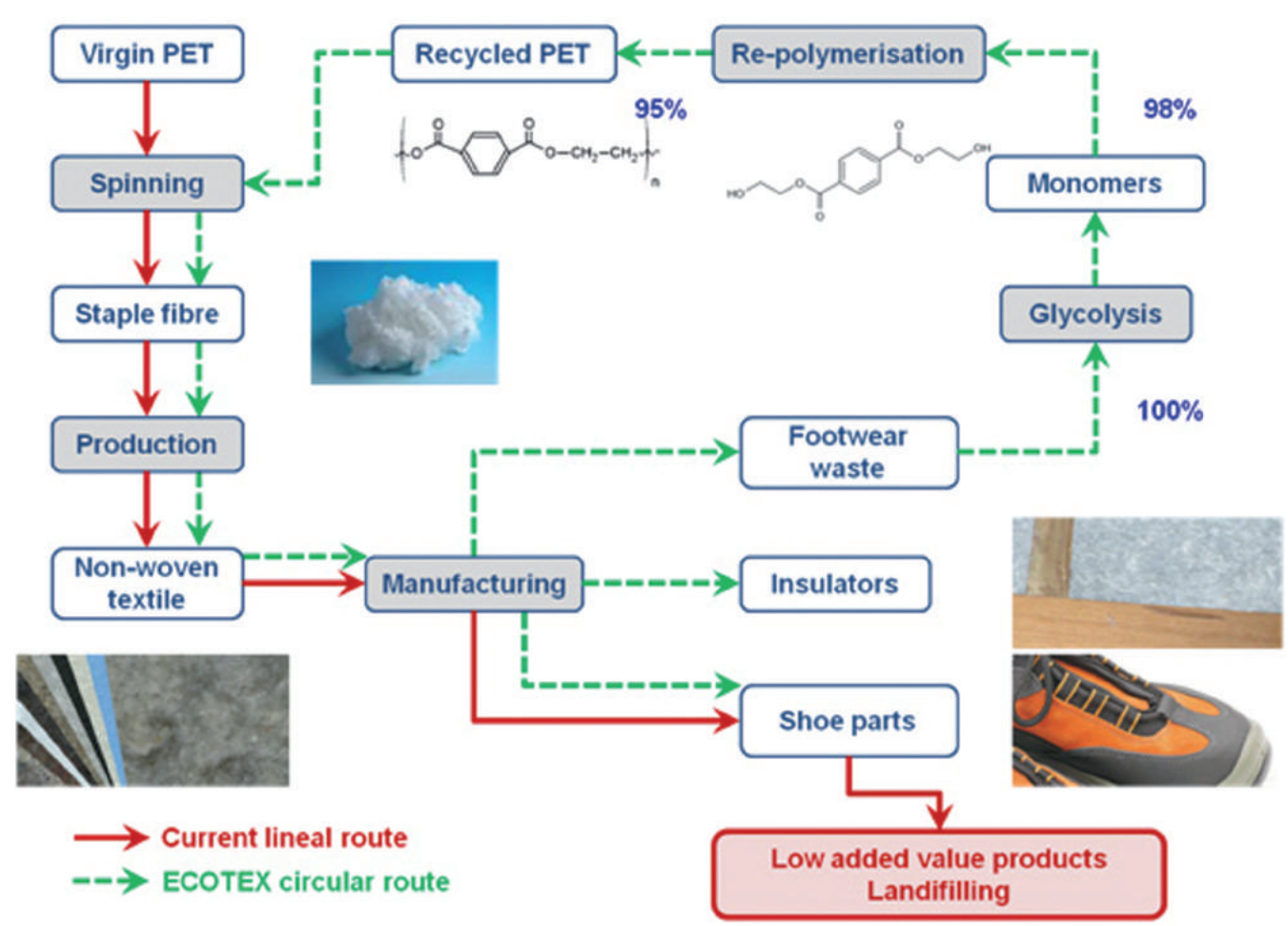
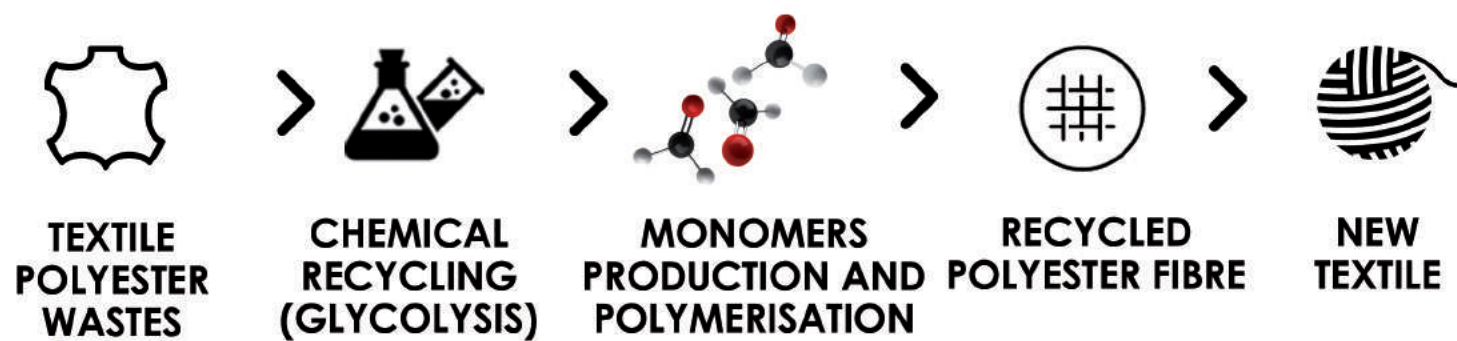


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### METHODOLOGY

Throughout the project's 36-month duration, the project activities will demonstrate not only the depolymerisation process of polyester textile waste, but also the viability to obtain the chemical monomer, Bis (2-hydroxyethyl) terephate, to re-polymerise to polyester fibre. Ultimately, these fibres can be transformed into yarn to manufacture new textile products.





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### RESULTS

The **expected results** of the LIFE-ECOTEX projects are the following:

- Demonstration of the Circular Economy concept where 750 kg of polyester textile waste from the footwear industry is recycled chemically via catalytic glycolysis.
- Production of 800 kg of new textiles products from polyester textile fibres chemically recycled:
  - Nonwoven ECOTEX felts.
  - Nonwoven polyester insoles ECOTEX from 650 to 800 g/m<sup>2</sup>.
  - Nonwoven isolation panels ECOTEX with 1.500 g/m<sup>2</sup> and 60 mm thick.
- Reduction of greenhouse gas emissions, estimated at around 1,47 t CO<sub>2</sub> eq / t per PET produced.
- Development of environmental policy recommendations on the use of chemically recycled polyester in textile manufacturing.
- Detection of the replicability and transferability of the recycling process developed.
- Dissemination of the project and results through press releases, workshops, scientific articles, etc.

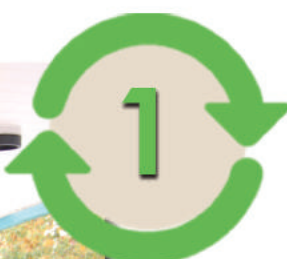




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### ACTIONS



#### START OF THE LIFE-ECOTEX PROJECT

The launch of the LIFE-ECOTEX project took place on October 26th 2016 at GAIKER IK4's facilities.

The project has a total budget of 1.246.048€ and is co-funded by the European LIFE 2015 Program.

#### NEEMO MEETING

On January 30th 2017 GAIKER IK4 hosted the project meeting with the European Commission's performance monitor, NEEMO. The project objectives and administrative aspects were reviewed to ensure optimal project development.





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### ACTIONS



#### NETWORKING WITH THE RESEARCH GROUP "CLEAN TECHNOLOGIES FOR THE ENVIRONMENTAL SUSTAINABILITY"

As part of the activities in action D1. Dissemination planning and execution, GAIKER-IK4 and the research group "Clean technologies for the environmental sustainability" of the University of the Basque Country's (UPV-EHB) Department of Chemical Engineering held a networking and exchange meeting. It took place on February 2nd at the UPV-EHB and included Professor José Ignacio Gutiérrez Ortiz and Dr. Rubén López Fonseca.

#### DISSEMINATION OF THE PROJECT AT THE TRADE FAIR "MOMAD SHOES" 04-06.03.2017

During the trade fair "Momad Shoes", which took place from March 4th to 6th at IFEMA in Madrid, the Footwear Technology Centre of La Rioja (CTCR) presented the LIFE-ECOTEX project in their stand. Visuals were used to show companies and visitors how the circular economy concept is applied in the footwear sector





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### ACTIONS



#### PREPARATION OF POLYESTER-BASED WASTE FOR DE-POLYMERISATION

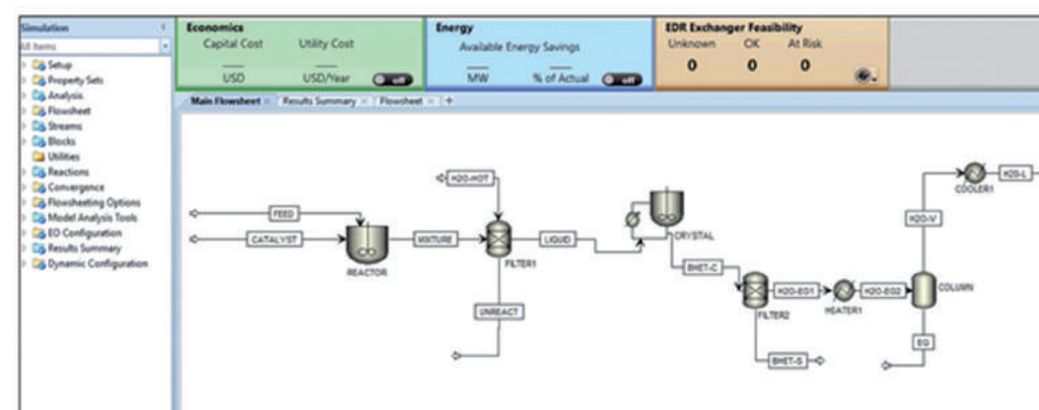
In this first action of the project all the polyester waste from footwear manufacturers (cutting materials, lining materials, insoles, etc.) were collected and analysed.

The polyester wastes were characterised, processed and grinded to obtain the ideal particle size for the following phase of de-polymerisation.



#### DESIGN AND SIMULATION OF THE CATALYTIC GLYCOLYSIS RECYCLING PROCESS FOR POLYESTER TEXTILE WASTE

As a part of the activities carried out in the action A2. Adjustment of the demonstrative catalytic glycolysis pilot experiences reproducing the BHET monomer from polyester textile wastes, the design and simulation of the catalytic glycolysis process was completed. Based on the data provided by GAIKER-IK4 in the pilot plant tests, BETA used the Aspen Plus software to simulate the different stages of the catalytic glycolysis process, thereby optimizing the technical and operational parameters of the process PET2BHET.





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#### FIRST POSITIVE RESULTS FOR THE OBTENTION OF VIRGIN PET

The first results of the catalytic glycolysis recycling process at GAIKER-IK4's pilot plant confirm the possibility to obtain the previous compound, BHET, needed to polymerize and get virgin PET.

#### DESIGN OF THE DEMONSTRATIVE PROTOTYPES

In this action, after studying the "LifeCycle Assesment" (LCA), an eco-design methodology was identified, which combined with 3D design software, allowed for insole and isolation prototypes to be developed. In parallel, the physical requirements of the insole and the isolation, which will be manufactured with recycled polyester fibre, were designed and studied.







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### SOCIAL NETWORKS

The LIFE-ECOTEX project currently has a **TWITTER** profile and **LINKEDIN** group, both of which are continuously active.

The **social networks** are used to contribute to the dissemination of the project's developments and results, as well as to stimulate discussion topics and share sector-related news.



Life-ECOTEX Group



@life\_ecotex



www.life-ecotex.eu





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### MEDIA IMPACT

The following is a selection of the most relevant media outlets where LIFE-ECOTEX has featured.







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Contact:  
[www.life-ecotex.eu](http://www.life-ecotex.eu)

