

Replacing plastic with new bio-based materials:

The Horizon Europe Green-Loop delegation in Italy to learn about the results achieved in the research and production of new bio-based materials.

Breganze (Vicenza, Italy), 20 March 2024 – Replacing plastic with bio-based materials. Transforming agricultural waste into packaging materials and more. This is one of the challenges that the Horizon Europe GREEN-LOOP project, launched at the end of 2022, has entrusted to the Vicenza-based start-up Mixcycling. Today, with the support of NSBproject, dissemination leader of the GREEN-LOOP project in its role as innovation broker, Mixcycling has delivered the first tangible results to the delegation of European project partners.

The delegation of the consortium of partners of the Horizon Europe GREEN-LOOP project visited the new production plant today and, together with some representatives of Italian companies, were able to test the potential of the biocomposites created by Mixcycling through the valorisation of agricultural waste.

In particular, the technological innovation that the Vicenza-based company has been able to develop thanks to GREEN-LOOP concerns the processing and valorisation of some agricultural waste materials (such as rice husks, grape marc, etc.).

The research started to provide food packaging and materials for the creation of sustainable caps has given very positive results, opening up the horizon to the replacement of plastic in other areas where, until now, no other material has guaranteed the same performance in terms of strength, hygiene and the ability to take on the most diverse shapes.

GREEN-LOOP aims to strengthen and support the bioeconomy at European level through a solid design of products adapted to new sustainable and circular schemes, reducing production costs and accelerating the introduction of new bio-based products to the market.

The innovation potential focuses on the techniques needed to realise the GREEN-LOOP vision, which includes the conversion of conventional production systems to adapt to new bio-based production, the electrification of production systems (microwaves and ultrasound), advanced control with monitoring, artificial intelligence and sustainable design of final products.

GREEN-LOOP will cover the entire value chain: from biomass supply to conversion and pre-treatment, to innovative and enhanced bio-based production, to the TRL6



industrialisation system, end-user testing and finally, end-of-life activities (recycling, reconditioning and reuse).

Three innovative bio-based materials and components for industrial sectors will be designed and optimised, the processes of which will refer to:

- Multifunctional fire-retardant and anti-vibration panels from BIO-RUBBER
- Bottle caps for the packaging, food and beverage sectors from BIO-PLASTIC
- Sliding bearings for appliances and tools from WOOD COMPOSITES

CIRCULARITY BY DESIGN

GREEN-LOOP will focus on a production and consumption model that involves the reuse, repair, reconditioning and recycling of bio-based products produced. Waste will become a resource in itself, minimising the actual amount of waste. In addition, GREEN-LOOP will explore and apply opportunities for a second use of products through cleaner production audits to seek advantageous solutions through technological route changes, use of bio-based raw materials and process optimisation for each value chain.

GREEN AND SMART MANUFACTURING

The project will address policies and regulations at European level, examine economic incentives and carry out a detailed analysis of the competitive advantages of implementing bio-based products. Intelligent connectivity will be included to collect data from machines and devices through controllers and sensors; subsequently, that data will be converted into meaningful information. The monitoring and control systems included in GREEN-LOOP will lead to consistent products with low variability, greater repeatability and the highest quality standards. A self-configuration module based on previous experience will be included to keep production as improved as possible.

GREEN-LOOP PLATFORM FOR CIRCULAR PRODUCTS

The GREEN-LOOP value chains will be evaluated and optimised within a multidisciplinary platform that will facilitate the analysis of business opportunities from raw material supply to end-of-life (recycling, reuse, reconditioning), improve activities to create new bio-based products and assess environmental and social aspects. These results will provide information on the social engagement that could be achieved, show the business optimisation for each bio-based product and the circularity aspects. The platform will also host the GREEN-LOOP training

programme and will also serve as a facilitator to ensure reliable and effective data sharing for open repositories.

TRAINING PROGRAMME

GREEN-LOOP will provide a strategy that ensures that society can have access to job and career opportunities and that bioeconomy businesses have access to the talent they need. The training programme will focus on advanced production techniques, bio-based materials and products, lessons learned and evaluation of the value chains of new projects through the GREEN-LOOP platform, smart manufacturing, business plans and international policies and regulations. The training programme, delivered mainly by webinars and recorded lessons, will address the short-term activities related to marketing and the business activities needed to manufacture new innovative bio-based products.

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