



High performance sustainable bio-based packaging with tailored end of life and upcycled secondary use

PRESERVE

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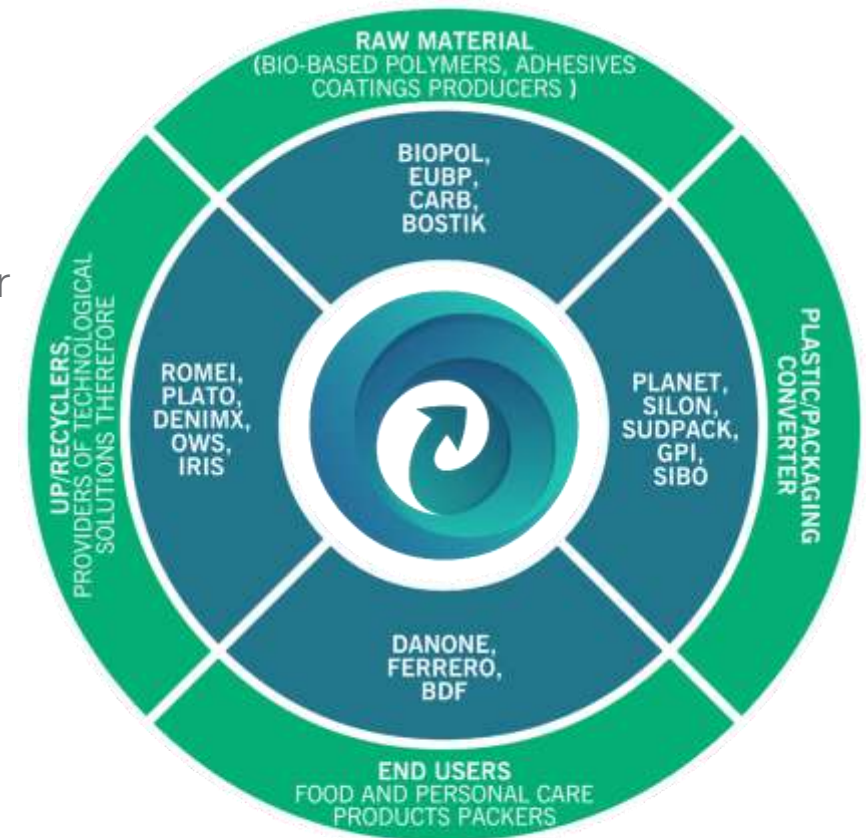
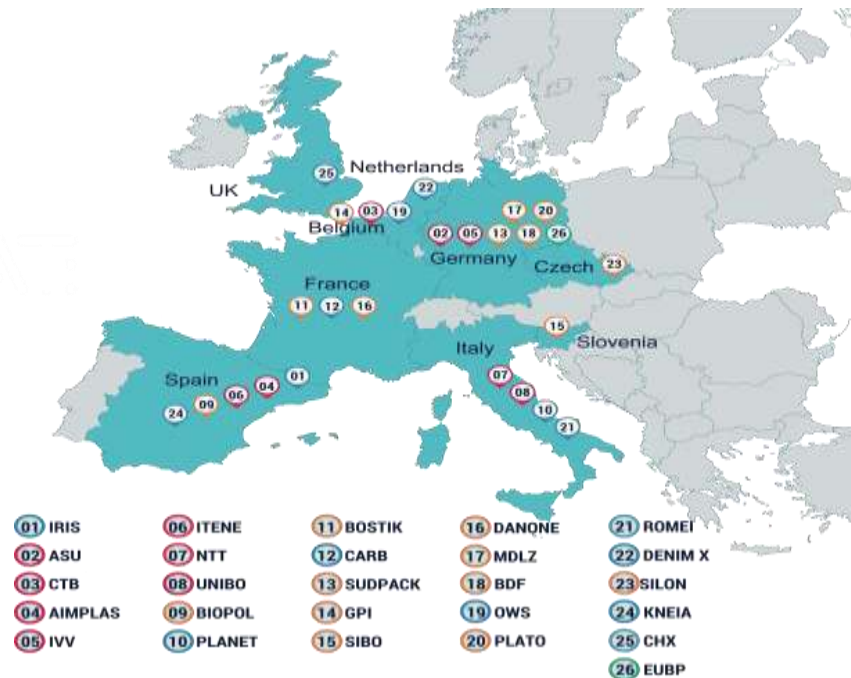
This project is funded by the Horizon 2020 Framework Programme
of the European Union under Grant Agreement Number **952983**

Preserve: Main figures

- **4 years (January 2021- Dec 2024)**

Funding from EC Horizon 2020 programme under the topic:
CE-BIOTEC-09-2020 Upcycling Bio Plastics of food and drinks packaging.

- **26 partners** including 7 research organisations, partners along the circular supply & value chain with large end users and the largest bioplastics producer/users' association.



Circular PRESERVE Value chain (only business partners, no RTOs or support service providers)

Why Preserve is needed?

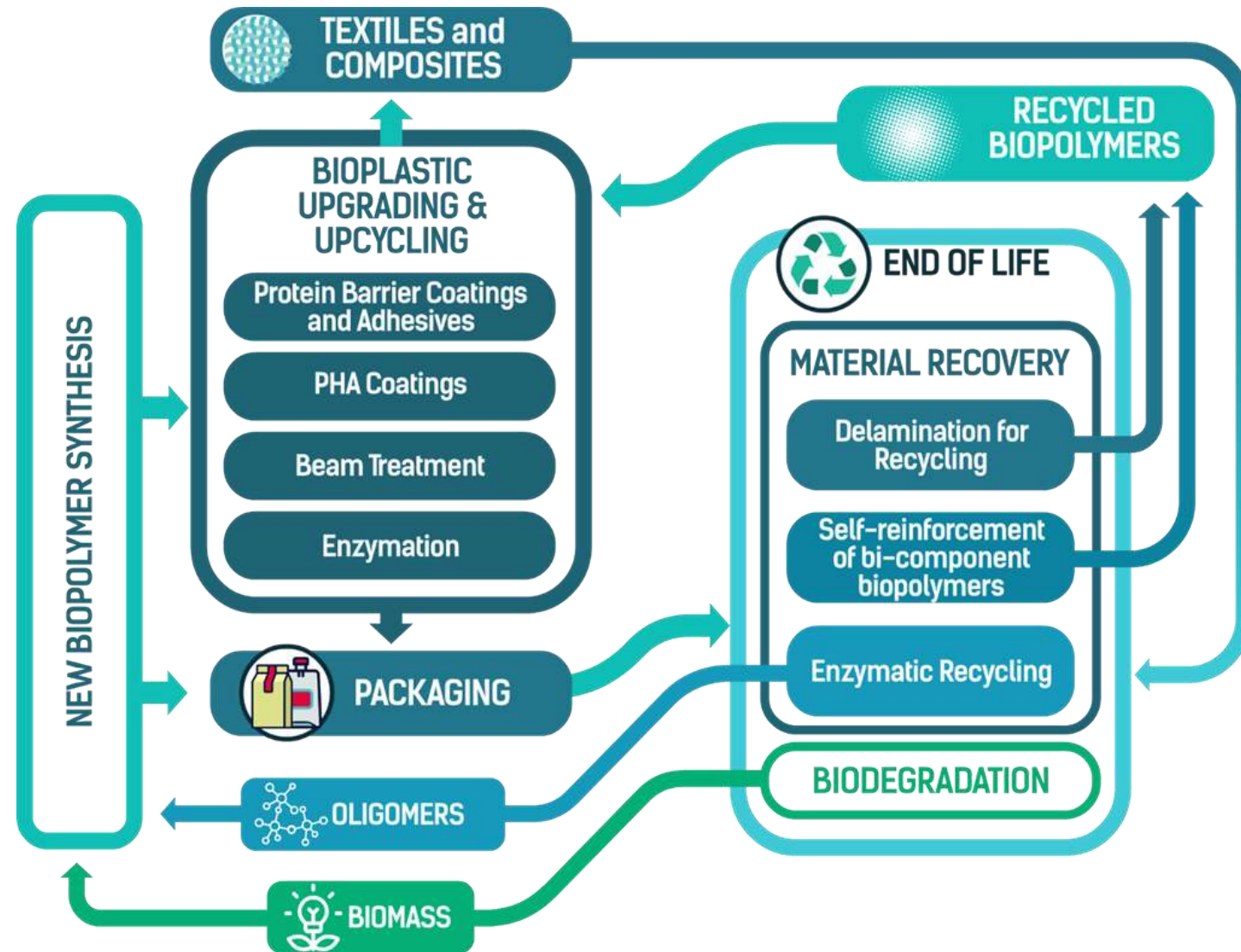
Europe is far from its targets in terms of CO₂ footprint (neutrality by 2050) and circular economy (all plastic packaging recyclable by 2030)!



- High performance bio-based materials need to be developed and produced.
- Their recycling approaches need to be better established and in motion.
- Biodegradability of biopolymers applications to be expanded to more environments.

Preserve objectives

- PRESERVE biomaterials upcycling strategies include self-reinforcement, eBeam-assisted material enhancement, removable coatings & adhesives.
- They will be fit for tailored EoL scenarios including reprocessing via self-reinforcement or after delamination, enzymatic recycling or enzyme-stimulated biodegradation.
- PRESERVE circular renewably sourced packaging solutions and derived upcycled packaging applications will optimally *preserve the packed good* but also our finite material and energy resources and the environment.



Technical activities to reach Preserve solutions

Technologies applied in PRESERVE :

- Protein- based coatings and adhesives.
- PHA coatings.
- eBeam treatment of biopolymers.
- Use of biopolymers for personal care and transport packaging.
- Reinforcement of biocomponents biopolymers.
- Delamination.
- Enzymes-based recycling.

Bio-based packaging for food & drinks (Primary upcycled bioplastics)



Secondary raw material upcycling into cosmetic packaging, textiles & composites

PRESERVE technical challenges

Development of PHA fermentation protocols and coatings

- amount vs expected time frame → fall back to commercially available grades of PHA for initial trials
- Delays in technical work needs to be anticipated
- Use of consortium resources and connections to mitigate delays, e.g. support from partners facilities or mediate industry contacts
- Potentially lot of variation in the performance and quality of newly developed material
- Optimization of coating formulations for minimal material quantity, e.g. use of blends



Metallization of protein coating for barrier improvement

- difficulties expected → metallization performed in vacuum (PVD) vs water content in coating ⇒ alternative methods considered
- preliminary results positive, less defects found than expected
- barrier measurements ongoing to verify “optical” results



Christian

EUBP

Christian

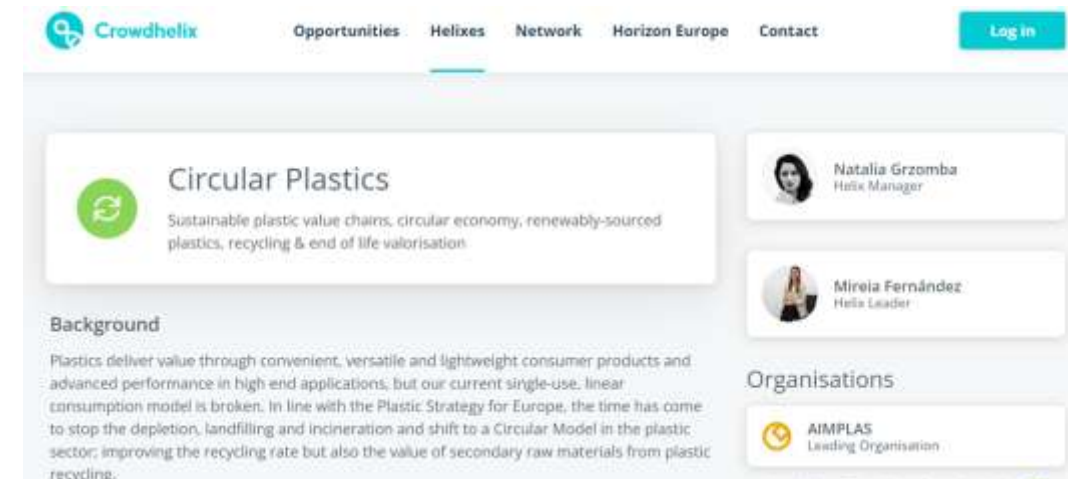
- EUBP



PRESERVE online community

Online communication is relevant since early stages of the project.

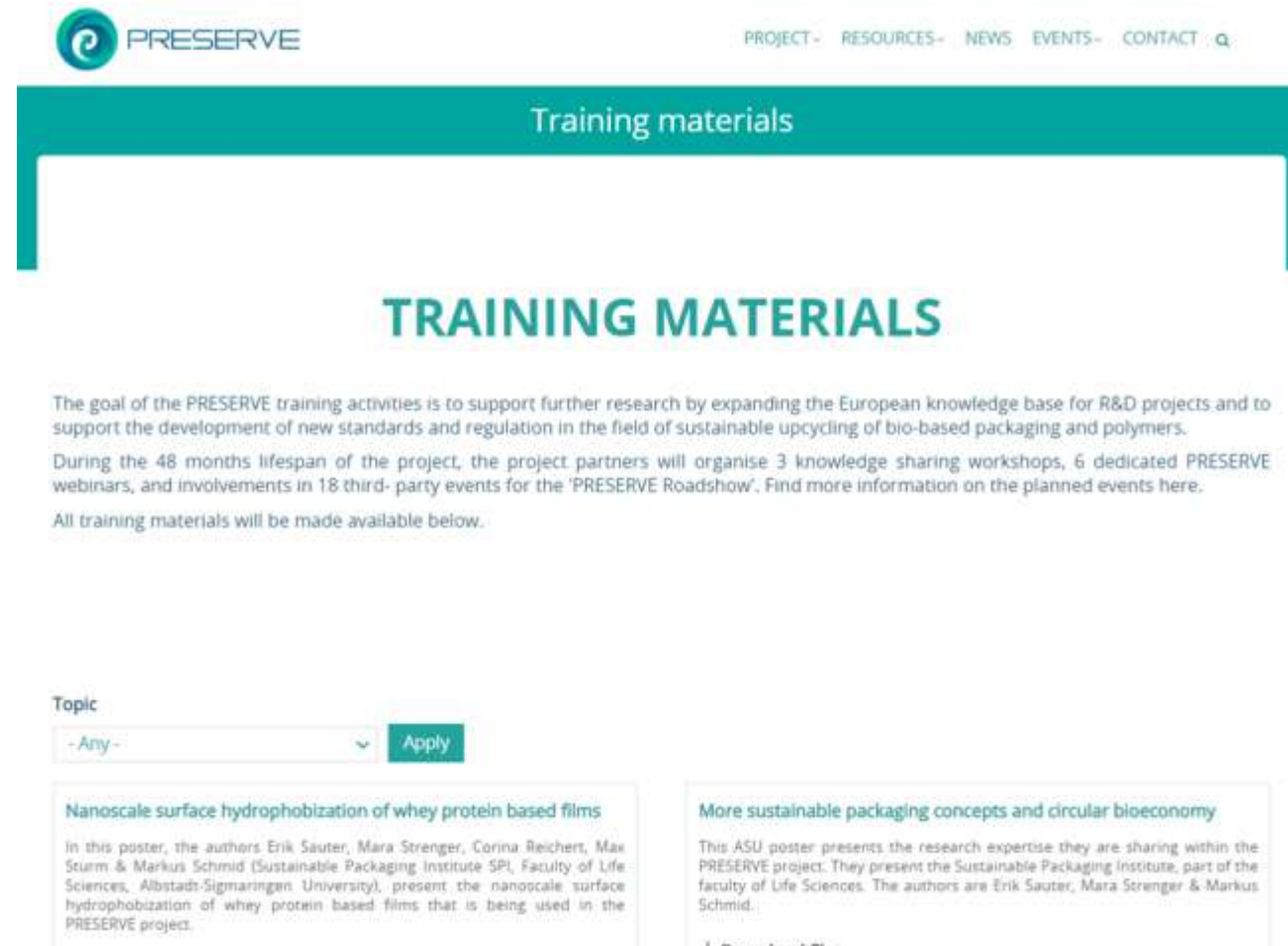
- Communication phases according to the advances of the project
- Content plan for publications
- Collaboration with project partners for obtaining relevant insights.
- Reposting activities from other relevant stakeholders
- Relevant space on Crowdhelix/Circular Plastics Helix with more than 500 experts and 170 organizations



PRESERVE Dissemination

Dissemination is not only about publishing results

- Dissemination plan is intertwined with Training Plan for Knowledge Transfer and Educational Sessions
- Identified internal PRESERVE entities will enable know-how transfer internally and externally
- [Zenodo community](#) to ensure open access
- Training materials available on [PRESERVE website](#)



The screenshot shows the 'Training materials' section of the PRESERVE website. At the top, there is a navigation bar with links for PROJECT, RESOURCES, NEWS, EVENTS, and CONTACT. Below this, the title 'Training materials' is displayed in a teal box. The main heading 'TRAINING MATERIALS' is in large, bold, teal letters. The text below explains the goal of the PRESERVE training activities: to support further research by expanding the European knowledge base for R&D projects and to support the development of new standards and regulation in the field of sustainable upcycling of bio-based packaging and polymers. It also mentions that during the 48-month lifespan of the project, there will be 3 knowledge sharing workshops, 6 dedicated PRESERVE webinars, and involvements in 18 third-party events for the 'PRESERVE Roadshow'. A link is provided to find more information on the planned events. Below this, a section titled 'All training materials will be made available below.' features a search filter with a 'Topic' dropdown menu set to '- Any -' and an 'Apply' button. Two training materials are listed: 'Nanoscale surface hydrophobization of whey protein based films' and 'More sustainable packaging concepts and circular bioeconomy'. Each entry includes a brief description of the research and the authors.

TRAINING MATERIALS

The goal of the PRESERVE training activities is to support further research by expanding the European knowledge base for R&D projects and to support the development of new standards and regulation in the field of sustainable upcycling of bio-based packaging and polymers.

During the 48 months lifespan of the project, the project partners will organise 3 knowledge sharing workshops, 6 dedicated PRESERVE webinars, and involvements in 18 third-party events for the 'PRESERVE Roadshow'. Find more information on the planned events here.

All training materials will be made available below.

Topic:

Nanoscale surface hydrophobization of whey protein based films

In this poster, the authors Erik Sauter, Mara Strenger, Corina Reichert, Max Sturm & Markus Schmid (Sustainable Packaging Institute SPI, Faculty of Life Sciences, Albstadt-Sigmaringen University), present the nanoscale surface hydrophobization of whey protein based films that is being used in the PRESERVE project.

More sustainable packaging concepts and circular bioeconomy

This ASU poster presents the research expertise they are sharing within the PRESERVE project. They present the Sustainable Packaging Institute, part of the faculty of Life Sciences. The authors are Erik Sauter, Mara Strenger & Markus Schmid.

BIOTEC-09 CLUSTER

Achieved so far:

- Close collaboration established with UPLIFT and upPE-T at the early stages of the projects
- Joint online workshop in October 2021 on upcycling bio-plastic of food and drink packaging and the importance of clustering led by UPLIFT
- 2nd joint workshop in April 2022 on standardisation in plastics and circular economy led by upPE-T

In the works:

- further workshops and events
- supporting each other's social media activities
- joint policy recommendations in the final stages of the project





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**THANK YOU FOR
YOUR ATTENTION**

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