



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

PRESERVE

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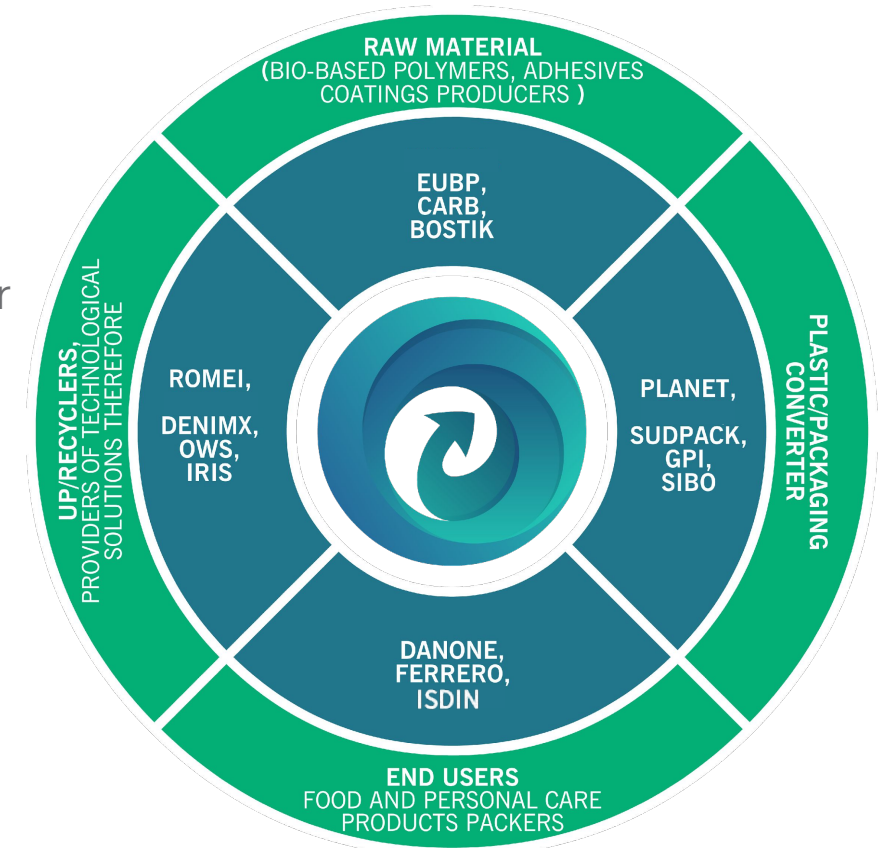
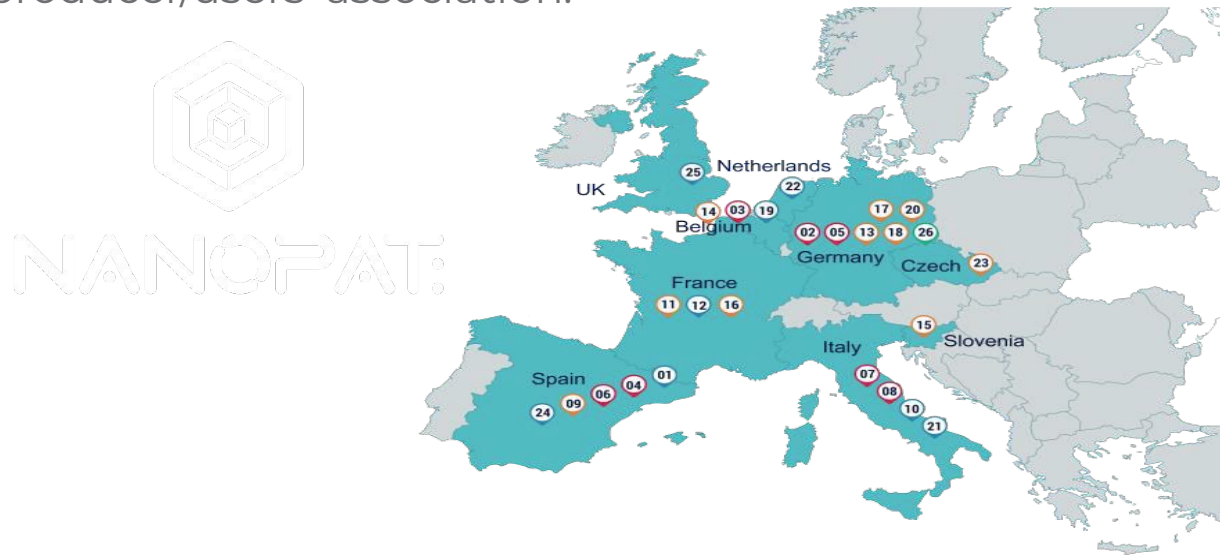
This project is funded by the Horizon 2020 Framework Programme of the European Union under Grant Agreement Number **952983**

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.*

- **23 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?

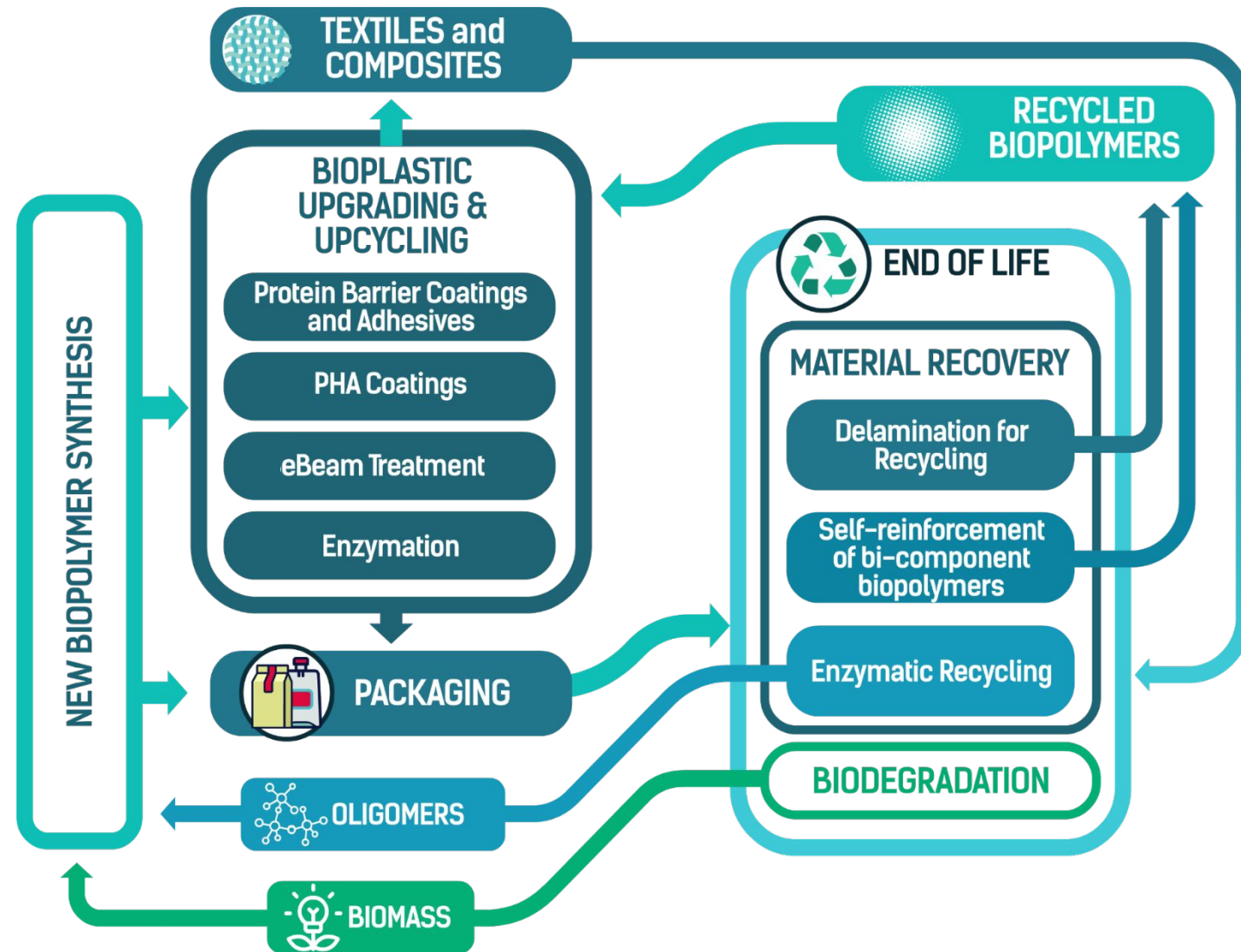
Europe is far from its targets in terms of CO₂ footprint (neutrality by 2050) and circular economy (all plastic packaging recyclable by 2030)!



- 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 bi-components 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

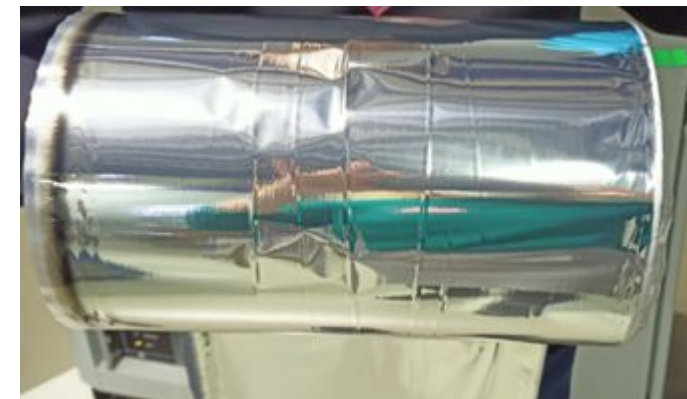
Development of PHA fermentation protocols and coatings

- amount vs expected time frame → fall back to commercially available grades of PHA for initial trials
- Delays in technical work needed 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 verified “optical” results





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**THANK YOU FOR
YOUR ATTENTION**



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