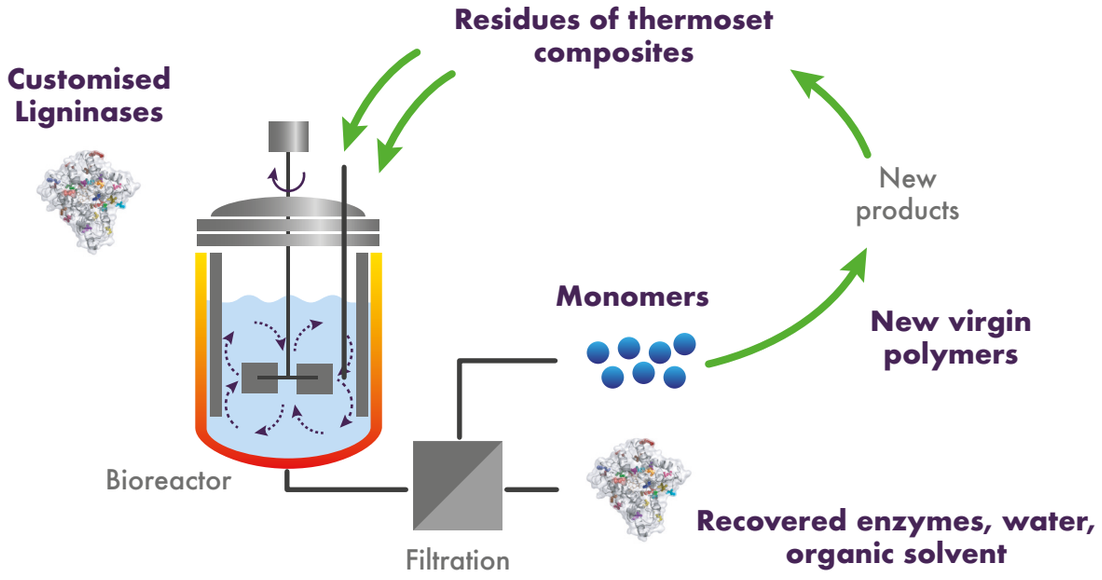
BIZENTE

Apply Ligninases To Resolve End - of - life Issues of Thermoset Composite Plastics

BIZENTE project presents a biocatalytic model of enzymatic degradation as a novel alternative to the end-of-life of thermoset composites.

1. Directed evolution: Directed molecular evolution allows the design of enzymes with improved features and novel enzymatic functions not required in natural environments. Therefore, it is possible to generate enzymes with the desired characteristics, such as stability at high temperature or in organic solvents, improved catalytic activities, higher specificity, etc.

2. Composites chemistry: Pre-treatments of composites: mechanical and chemical pre-treatments must be applied on the target resins in order to increase the exposed surface to the enzymatic degradation. Chemical modification of resins: identify the physico-chemical parameters that are influencing the enzymatic biodegradation of the resins and finely tune the resins components in order to introduce specific moieties that will favour the degradation.



3. Soluble compounds: Biodegradation processes will initially be studied in liquid medium using customised enzymes and low-molecular weight model compounds which contain all structural features of the target resins.

4. Biodegradation process: The products obtained will be chemically modified to turn them into useful bulk chemical building blocks which will be valorised in new products and sectors, contributing in this way to achieve a circular economy in the thermoset composites.

BIO-BASED INDUSTRIES Public-Private Partnership

Bio-based Industries Consortium

This project has received funding from the Bio Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement N° 886567

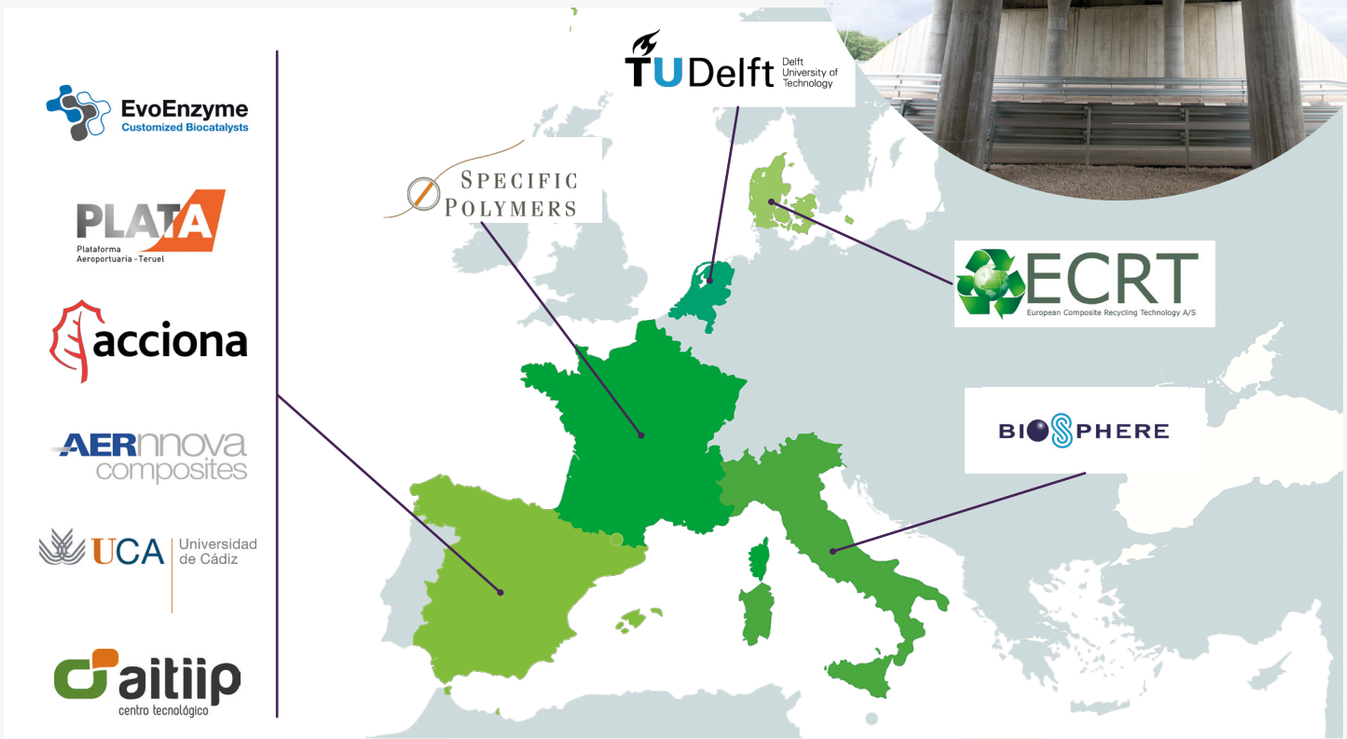
Outcomes

Contribute to decrease in at least a 40% the amount of non-biodegradable polymers currently discharged to the environment or sent to landfill and incineration.

Develop the first bio-catalytic technology based on ligninases enzymes to efficiently and sustainably solve problems posed by thermoset composites once they have reached their end-of-life.

Open up new markets and business opportunities for the treatment of plastic waste while establishing a new value chain for the products obtained after biodegradation.

Consortium



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