

From wood waste to biobased composite materials for long-term applications

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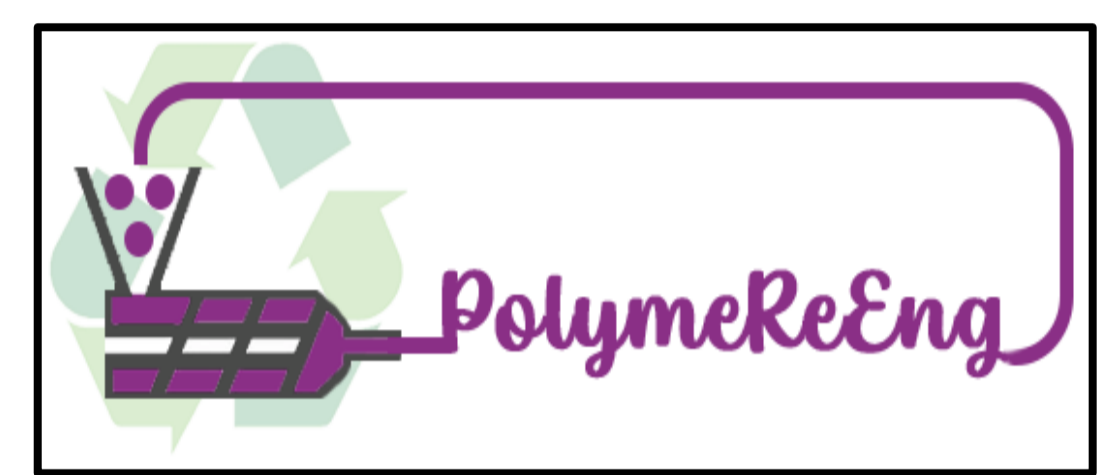
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WOOD2WOOD



is a Horizon Europe project, which aims to **develop a comprehensive framework for multi-dimensional valorisation of wood from waste**. The project consists of four main pillars: Advanced Separation and Sorting Technologies; Upcycling Processes and Technologies; Digital Tools for Improving Circular Flows of Secondary Materials; and Supportive Framework in Policy, Market, and Skills. **W2W will demonstrate efficient and sustainable routes to produce wood without pollutants, biocomposite building materials, biopolymers, polyols and chemical detergents**, reducing the demand for virgin materials and the amount of waste that ends up in landfills or incineration facilities. New value-added products from waste materials will be created, supporting the transition **towards a circular economy by promoting closed-loop systems**.

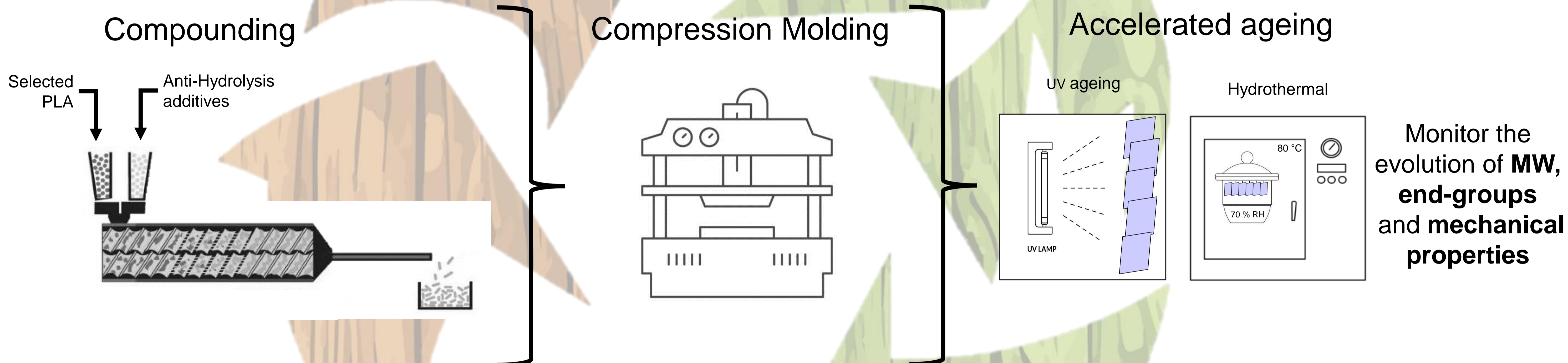
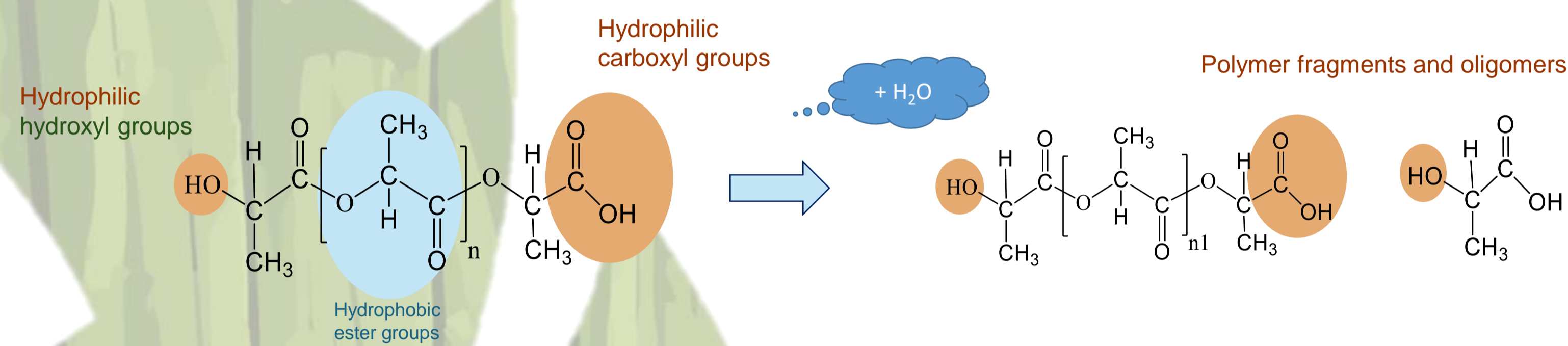
The role of the **NTUA group** is the **combination of poly(lactic acid) (PLA)**, as a biodegradable polymeric matrix, and **lignocellulose-based materials** recovered from wood waste, as natural fillers, to **deliver composite compounds** that will serve as low-cost sustainable recycled materials **for long-term applications**.



Research Methodology

> Hydrolytic study and stabilization of PLA grades

Minimize hydrolytic degradation by capping polar end groups and/or water using anti-hydrolysis agents



> Develop wood-based composite compounds with satisfactory **thermal and mechanical** properties by studying:

- Different **PLA grades** based on the mapping of available commercial grades and targeted properties
- Filler **type** and **loading**
- Compounding **conditions**

The challenge

Filler-matrix compatibility and composite compounds homogeneity due to the hydrophobic and nonpolar character of the polymeric matrix, leading to challenges during processing but also affecting the final properties of the composites.

