

The WoodTreat project: toward recovery of clean secondary materials from “highly polluted” post-consumer wood

BESSERER Arnaud¹, BROSSE Nicolas¹, IRLE Mark², LEBRETON Flore², LECOURT Michael³, TAPIN-LINGUA Sandra³, BEDEL Laurent⁴, MEINLSCHMIDT Peter⁵, KLADIS Anastasios⁶, BALDUCCI Francesco⁷, ADAMOPOULOS Stergios⁸

¹ Université de Lorraine, INRAe, LERMAB, Epinal, 88000, France

² Ecole Supérieure du Bois, Nantes, France

³ Institut FCBA, Institut Technologique Forêt Cellulose Bois-Construction Ameublement, Grenoble, France

⁴ SOPREMA, Strasbourg, France

⁵ Technology for Wood and Natural Fibre-Based Materials, Fraunhofer Institute for Wood Research WKI, Braunschweig, Germany

⁶ Advanced minerals and recycling industrial solutions (Admiris), Athens, Greece

⁷ Manifaktura, Pesaro, Italy

⁸ Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden

arnaud.besserer@univ-lorraine.fr

Mots clés : Wood recycling, cascade valorization, highly polluted post-consumer wood

Context and objectives

Wood is impregnated with preservatives (pesticides, fungicides and insecticides) to enhance its bio-resistance. However, this limits the recyclability of wood at the end of its life in a circular economy since the biocides could persist in sequential recycling loops. The increased use of wood, as encouraged by initiatives like the New European Bauhaus (NEB), is likely to require additional volumes of preservative-treated wood. Even though such treatments extend the service life of wood products, they will still eventually become waste and must be dealt with. Wood waste comprises of several wood products with different levels of contamination, and the management of this complex feedstock requires a range of methods and the collaboration of many stakeholders. The most polluted grade (highly polluted post-consumer wood, HPPCW), often referred to as Grade C or AIII/AIV depending on the country, consists of preservative-treated wood and is currently not recycled. Wood preservation compounds pose a significant threat to not only to the environment but also to human health, and therefore it is a high priority to develop new methods to distinguish chemically contaminated wood waste along with efficient cleaning and remediation technologies. The Woodtreat project, funded under the Horizon Europe programme (HORIZON-JU-CBE-2024-R-01), addresses the pressing challenge of valorising highly polluted post-consumer wood waste (HPPCW) and creosote-treated wood (CTW). These waste streams, often contaminated with hazardous preservatives are currently incinerated or landfilled. This poses significant environmental and health risks. Woodtreat proposes a transformative, multi-sectoral approach to recover clean secondary materials from these waste streams and convert them into high-value bio-based products. The project integrates cutting-edge technologies for detection, sorting, and depollution, including a neutron-based online characterization system, hydro-mechanical cleaning, thermo-bio-chemical treatments, and hydrothermal carbonisation (HTC). These innovations are validated through seven industrially relevant pilot validation trials (PVTs), targeting applications in construction, furniture, chemicals, and energy sectors (Fig. 1).

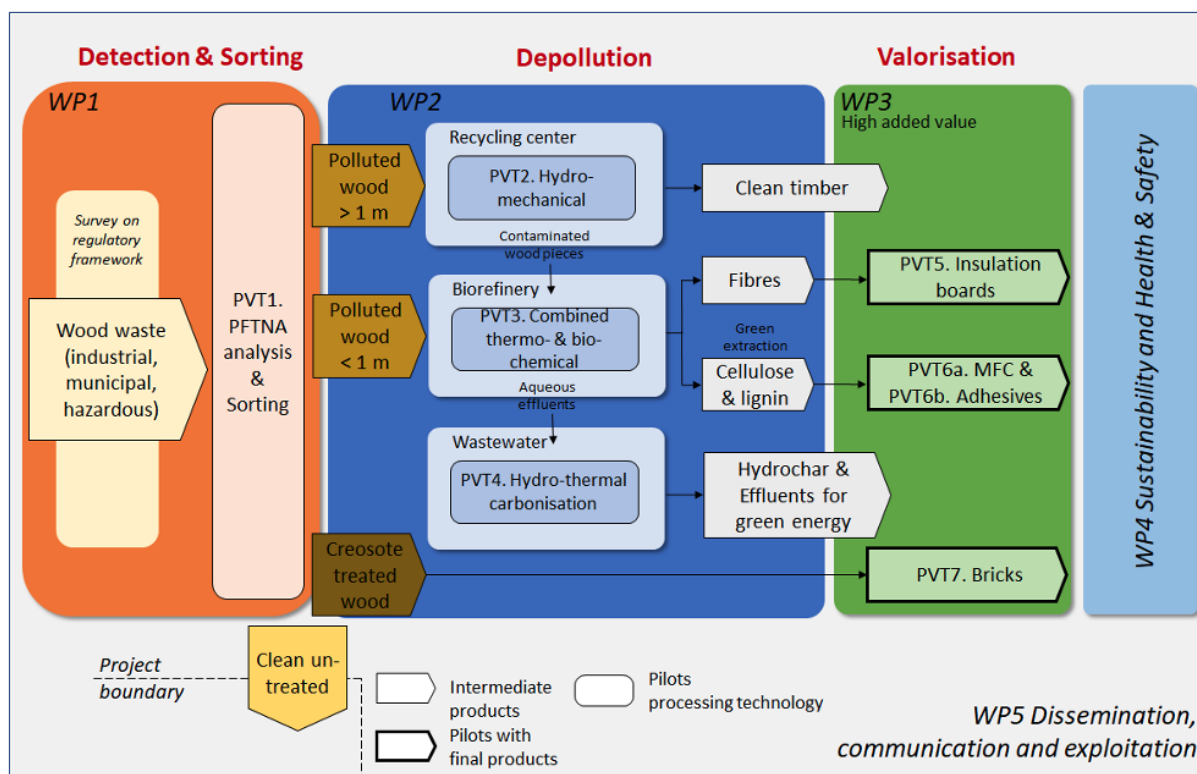


Fig. 1 : Main workflow of the Woodtreat project

The project is structured around six work packages (WPs) and involves 20 partners from 13 countries, including leading research institutions, industrial manufacturers, recyclers, and policy experts. It emphasizes a cascade valorization strategy, ensuring that recovered materials are used in the most resource-efficient and sustainable manner (Fig. 2).



Fig. 2 : Overview of the value chain covered by Woodtreat

Acknowledgements

This project is supported by the Circular Bio-based Europe Joint Undertaking and its members and is part of the European Union's Horizon Europe programme under grant agreement N° 101214288.