EcoReFibre

ECOLOGICAL SOLUTIONS FOR RECOVERY OF SECONDARY MATERIALS FROM POST-CONSUMER FIBREBOARDS

Funded by the European Union

PRESS RELEASE

Brussels, May 31st, 2022

European wood panel industry scales up end-of-life recycling and circular use of recovered wood

Horizon Europe project *EcoReFibre* explores smart sorting and processing technologies to recycle post-consumer waste wood back into fibreboards and into novel building products. Five highly promising pilots with leading panel manufacturers are launched to demonstrate how Circular Economy approaches linked with innovative, digital-supported technologies will enable security of raw material supplies. EcoReFibre's aim is to increase available wood resources in Europe.

Reducing the dependency from both fossil-based resources and from international raw material markets is becoming critically important to European policies, following the growing concern about global economic impacts of Russia's war against Ukraine. The European Green Deal was set as the new industrial policy to tackle climate change, by fostering sustainable, circular products, reduced waste and increased energy performance. In the new emerging global order, the green transformation will moreover also play a key role to ensure a strong domestic supply of materials and energy from renewable sources.

Fibreboards are engineered wood panels, which are widely used in furniture, interior design and construction. Europe is leader in fibreboard production, which reaches a worldwide production of over 100 million cubic metres per year. **The market success of dry process fibreboards, particularly medium density fibreboard (MDF), leads to huge quantities of fibreboard waste being generated every year.** Today, there is no commercially viable method to recycle post-consumer fibreboard into new fibreboards. Consequently, fibreboards are made mostly from refined virgin wood, i.e. wood harvested from the forest and processing residues from sawmills and plywood manufacture. Secondly, despite the industry's capability to incorporate recycled wood in the manufacture of particleboard, there are still large amounts of waste wood that continue to be burnt or even landfilled, contradicting the principles of a circular economy.

With a 12 million EUR grant from the European Commission's Horizon Europe programme, the project will run from May 2022 until April 2026. The consortium comprises 20 partner organisations in 7 countries, including leading panel producers and equipment manufacturers. The project team held their kickoff meeting from May 18 to 19, 2022, in Uppsala, Sweden.

"The *EcoReFibre* project will explore a *cascade concept* to recover raw materials from waste fibreboard, which will then become available for remanufacture of industrial products", says project coordinator Stergios Adamopoulos of the Swedish University of Agricultural Sciences. With enhanced sorting equipment, fibreboards will be extracted from the wood waste stream, which can then be processed to generate secondary raw materials of fibres and fines of defined quality.

The ambitious goal is to substitute up to 25% of the virgin fibres used in the manufacture of new fibreboard by secondary recovered fibres. The innovative technologies used include a smart sorting machine, an impact reactor and improvements to existing TMP refiners (thermo-mechanical process). The different end-products to be tested include particleboard, biocomposite construction blocks and CTB (cyclic thin board), new MDF and HDF (high density fibreboard), and insulation products (flexible board, hardboard, bulk insulation).

The project carries out a detailed market study to determine the current and future availability of waste MDF as a basis to upscale recycling business activities in Europe. **"Solid market data are necessary in order to give investors the confidence to invest in the machinery and processes being developed by EcoReFibre"**, says Dr. Mark Irle, Senior Researcher at Ecole Supérieure du Bois, Nantes, France. The environmental and social impacts and benefits of these novel technologies will also be analysed in detail from a life-cycle perspective.

The industry-led pilot demonstrations will be developed into solid business cases that increase the return on investment and create economic value, entrepreneurship, and new employment. By fostering a broad dissemination and exploitation of all tangible results, the project targets a wide uptake of the approved solutions in the European wood panel industrial sector.




Pictures: EcoReFibre consortium at kickoff meeting in Uppsala, Sweden, May 18-19, 2022 (top)
Stergios Adamopoulos, Swedish University of Agricultural Sciences, Sweden (first); Mark Irle, Ecole Supérieure du Bois, France (second); Matthias Graf, Dieffenbacher GmbH, Germany (third); Kris Wijnendaele, European Panel Federation, Belgium (fourth). Photo credits: InnovaWood, SLU, Dieffenbacher, Fraunhofer WKI.

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Follow the EcoReFibre Journey!

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ABOUT THE CONSORTIUM

Research partners

SWEDISH UNIVERSITY OF AGRICULTURAL SCIENCES is a leading university with responsibility for the development of learning and expertise in areas concerning biological resources and biomaterial production. The Department of Forest Biomaterials and Technology is responsible for the research area of Wood Science and Wood Technology. The Wood Science & Technology group is one of the few true material science orientated research groups and thereby ideally suited for involvement in the Biomaterials platform promoted by SLU for the period 2017-2025. slu.se

ECOLE SUPÉRIEURE DU BOIS trains wood scientists and technologists, from the technician to PhD level, for the French forestry-wood chain. It also conducts research grouped into two broad themes: comfort of the building envelope and the wood circular economy. The EcoReFibre project is a part of ESB's continuing research on intelligent and responsible recycling. ESB is based in Nantes, France. esb-campus.fr

FCBA is the technological institute for forest, cellulose, wood and furniture industries in France. Its mission is to promote technical progress, to participate in the improvement of yield and to guarantee quality in the industry. Its field of action covers the entire forestry-wood and furniture sectors: forestry, logging, sawmills, pulp and paper, wood-based panels, carpentry, structures, furniture, packaging and various products. Fcba.fr

NIBIO is one of the largest research institutes in Norway with approximately 700 employees. We contribute to food security and safety, sustainable resource management, innovation and value creation through research and knowledge production. nibio.no

INSTITUT FÜR HOLZTECHNOLOGIE DRESDEN has been an industrial research institution, since 1952, with expertise, technological know-how and specialist knowledge in the fields of wood anatomy and biology, material and product development, surface coating, health assessment of building products, and furniture and construction elements. ihd-dresden.de

IVL The Swedish Environmental Research Institute conducts advanced research and performs targeted consultancy assignments in relation to climate and environment. We support companies and civil authorities in their sustainability efforts to solve specific environmental problems in the domestic and international arenas. R&D forms the basis of our operations, and as research practitioners we also develop skills that form the basis for our consulting business. ivl.se

Associations and consulting support

European Panel Federation represents the manufacturers of wood-based panels being particleboard, dry process fibreboard (MDF), oriented strand board (OSB), hardboard, softboard and plywood. EPF has members in 32 European countries. The EU wood panel industry has a turnover of about 22 billion euro every year and provides over 100,000 jobs in Europe. The production of wood-based panels in the EU-27 (+EFTA) in 2020 was an estimated 58 million m³. europanels.org

INNOVAWOOD mission is to foster innovation and bring business benefit to the entire value chain from forestry to wood, to furniture and construction. InnovaWood provides an European platform to share knowledge, latest information and follow developments as well as innovative trends. InnovaWood aims to provide a strategic orientation to the European research and innovation ecosystem which is evolving in response to the global challenges. innovawood.com

FEDERLEGNOARREDO is the Italian Federation of Woodworking, Cork, Furniture, Lighting and Furnishing Industries. Founded in 1945, it associates more than 2100 enterprises, ranging from SMEs to industry leaders, and includes 11 sectorial associations, 8 affiliated associations and a Young Entrepreneurs Group. federlegnoarredo.it

STEINBEIS EUROPA ZENTRUM stands for over 30 years of experience in innovation consulting and research funding throughout Europe and beyond. Well-connected with international partners and networks, we stand by companies, start-ups, universities, research institutions and cluster initiatives on issues of innovation management, financing, EU applications, international markets, regional and social transformation and innovation policy. steinbeis-europa.de

Industrial partners and SMEs

DIEFFENBACHER is a leading manufacturer of press systems and complete production plants for the wood-based panels, composites and recycling industries. We combine technologies, processes and application know-how with extensive client collaboration to create advanced solutions and to help our customers achieve their business goals. dieffenbacher.com

SONAE ARAUCO is one of the largest wood-based solutions' players in the world. Our portfolio contemplates a sustainable range of products for furniture, interior design and construction, from the more standard to the most demanding from a technical viewpoint. sonaearauco.com

HOMANIT is one of the leading manufacturers of thin, high-quality finished, medium-density (MDF) and high-density (HDF) wood fibreboards in the European wood products industry and supply the furniture, door and coating industries worldwide. homanit.org

SMARTPANNEL SmartPannel will develop a new bio-based, sustainable construction block composed of a mixture of fibreboard processing residues (fines) with bioderived polyols. In EcoReFibre, a prototype production line for these blocks is installed and tested by SmartPannel. smartpanel.no

SOPREMA is an independent family group which is now positioned as one of the world's leading companies in the field of protection, energy efficiency and building management.
A responsible and pioneering industrialist, the Group is now a key player in this sector. SOPREMA offers high-performance, high-tech solutions that meet all the challenges of whatever renovation or new construction of both residential and non-residential buildings. SOPREMA systems are developed in an eco-design logic and today display exceptional performance in terms of quality and longevity. SOPREMA's vision: to act for the enhancement of the built heritage and the comfort of users, with the necessary reduction of its impact on the environment. soprema.fr

CORMATEX is a textile machinery manufacturer, located in Prato (Italy) and operating on the international markets for more than 35 years. The company is specialized in customized solutions for the Nonwoven Sector and has developed a special technology called "Airlay Lap Formair" for the conversion of waste materials into new added value products for various applications (building, insulation, automotive, home furnishing ecc.) cormatex.it

BIESSE Group is an international company that designs, manufactures and distributes systems and machines for processing wood, glass, stone, metal, plastic and composite materials aimed at the furniture, housing & construction, automotive and aerospace sectors. Founded in Pesaro, Italy, in 1969, it has been listed in the STAR segment of the Italian Stock Exchange since 2001. 80%of its consolidated turnover is achieved abroad. It operates in over 160 countries with 14 manufacturing sites and a direct presence in the main world markets. Today it has 4,300 employees. biessegroup.com

MANIFAKTURA is an INNOVATIVE start-up, that combines complementary skills developed in a decade of national and international experience in the wood-furniture sector, in particular in the field of product certifications, research training, innovative product development and tech transfer. In addition to their know-how on Circular Economy and Open Innovation, MANIFAKTURA boasts a wide network of relationships and collaborations with Clusters, Universities, Research Centers, Associations and Corporates/SME. manifaktura.net

VEOLIA is a recycling company that collects, sorts, processes and recycles around 50 million tons of household and industrial waste every year. Veolia supports the technological developments in Demos. veolia.com

MET4 is a Digital Innovation Company bridging efficiently the two worlds of IT and Materials into the new era of Industry 4.0, Artificial Intelligence (AI) and Machine Learning (ML). Senior scientists and engineers (with very strong academic background and industrial experience in both fields) are deeply analysing manufacturing systems and processes and apply all modern analytic and AI/ML tools' in order to identify improvement points, lower costs and increase efficiency and safety of operations. Additionally, they offer full IT infrastructure solutions for hosting developed AI systems and converting them into a handy, accessible and manageable powerful tool. met4.eu