

CIR4FUN Enters Active Field Phase to Address Europe's Furniture Recycling Deficit

Cir4Fun

Use Case 1

Roughly nine out of ten pieces of discarded furniture in the European Union end up in landfills or incineration plants, with only 10% successfully recycled. As environmental regulations tighten across member states, the furniture sector faces a major operational obstacle: a lack of standardised, traceable data regarding product materials and end-of-life waste flows.

To tackle this challenge, CIR4FUN is launching the field-testing phase of its primary demonstration track, **Use Case 1: From Waste to Raw Materials and Ecodesign**. The primary objective of this work stream is to bridge the gap between end-of-life waste management and upstream product design, creating a digital feedback loop that connects recycling infrastructure directly back to manufacturing floors.

The Five Demonstration Pilots

Use Case 1 brings together research institutes, municipal authorities, waste operators, and industrial manufacturers across five complementary pilots designed to test circular solutions in real-world environments:

- **Pilot 1 (Furniture Waste Treatment Management):** Led by Centro para a Valorização de Resíduos (CVR) alongside the Municipality of Guimarães, industrial panel manufacturer SONAE ARAUCO, and waste operator ELDIA. This pilot aims to design and test structured sorting protocols and selective dismantling methods at municipal collection points to better categorise bulky waste streams.
- **Pilot 2 (Upcycled Additive Manufacturing):** Led by ELDIA with the support of CVR. This pilot focuses on validating the recovery of fine wood processing by-products, testing their potential transformation into bio-composite filaments for 3D-printed applications.
- **Pilots 3, 4, and 5 (Eco-design and Use of Materials):** Three European manufacturing partners - Kave Home, Micuna, and SARA - intend to assess how the principles of "Safe and Sustainable by Design" (SSbD) and an improved environmental footprint assessment system (FAS) can be integrated into product development to test less hazardous and recycled content-based materials and components, with the goal of improving sustainability and recyclability of furniture.

Ongoing Field Testing & Expected Outcomes

At municipal collection sites, bulky furniture typically arrives fully assembled, making manual separation difficult and leading to mixed-material crushing. Through initial trials in Guimarães, Pilot 1 aims to demonstrate how selective dismantling and digital material passports can help operators identify item compositions quickly and preserve high-quality secondary wood for industrial particleboard production.

In parallel, testing in Thessaloniki by ELDIA (with the support of CVR) intends to test how recovered fine wood fractions can be integrated into bio-based polymers, exploring alternative circular pathways to keep low-value waste streams out of incinerators.

Digital Architecture & Implementation Path

To support these objectives, the project is deploying digital tools including Digital Product Passports for traceability, the CIR4FUN Data Space for secure cross-border data sharing, and the Furniture Assessment System (FAS) to measure dynamic Life Cycle Assessments.

With initial frameworks and tool integrations now set up, the consortium is actively carrying out first-stage field testing and prototype iterations. Feedback gathered from waste operators, recyclers, and design teams during this phase will be used to refine processes, with the ultimate goal of validating scalable, market-ready circular models for the European furniture sector before the project concludes.



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