From Waste to Value:
Policy Pathways for Cross-Sectoral
Circular Material Flows in Europe

*White paper on the policy insights from the implementation of the Workshop
"Revaluing Resources: Cross-Sectoral Circular Solutions for a Sustainable Future",
in Sustainable Places 2025, 8-10 October 2025, Milan, Italy*

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ReBoat, THESEUS Hub 4 Circularity, DeremCo, YouRban,
Wood2Wood, SUM4Re, ICONIC and STORCITO*

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Credit

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White paper on the policy insights from the implementation of the Workshop "Revaluing Resources: Cross-Sectoral Circular Solutions for a Sustainable Future"

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1. Introduction: Purpose and Scope

This document presents the key insights that emerged from the workshop "Re-Valuing Resources: Cross-Sectoral Circular Solutions for a Sustainable Future", implemented within the framework of the Sustainable Places 2025 event, on the 8th-10th of October 2025, in Milan, Italy. The workshop brought together eight Horizon Europe projects—ReBoat, THESEUS Hub 4 Circularity, DeremCo, YouRban, Wood2Wood, SUM4Re, ICONIC, and STORCITO—to explore how circular innovations can accelerate Europe's transition toward decarbonisation and climate neutrality. Even though each project operates in a different context—ranging from construction and industrial systems to islands, cities, and rural regions—they share a common goal: to transform linear material flows into recovering, cross-sectoral value chains.

The purpose of this document is threefold. First, it synthesises how the participating projects enable cross-circularity through material reuse, digital tools, and systemic approaches that intersect across industries, governance levels, and territorial scales. Second, it identifies the conditions that enable replication and scaling, drawing on real-world demonstrations and stakeholder experiences. Third, it highlights the social, community, and governance dimensions that underpin successful circular transitions, with a particular focus on participatory practices, long-term trust-building, and multi-actor collaboration.

Structured around the workshop's guiding themes—advancing cross-sectoral circularity, replication potential, and social engagement—the white paper translates project-level insights into messages relevant for policymakers, practitioners, and regional stakeholders. By examining the hands-on experiences of diverse pilots, from island-based resource loops to AI-assisted material banks and rural climate-resilience tools, it illustrates how locally adapted circular solutions can collectively contribute to European climate objectives while fostering economic and social value at territorial level.

2. Advancing cross circularity

A central insight emerging from the workshop is that meaningful circularity requires opening pathways for materials to flow across sectors, not merely within them. The projects demonstrate that the most impactful circular systems do not simply return materials to their original context—they redirect them into new industries, new practices, and new forms of value creation.

Composite materials previously linked to energy or automotive applications, for instance, enter new industrial ecosystems when reprocessed into components for construction, tooling or consumer goods (DeremCo). Similarly, wood waste, often contaminated or mixed with non-wood fractions, is not merely recycled but valorised into biocomposites, bio-based surfactants or polymers, thereby forging connections between the construction, chemical and manufacturing sectors (Wood2Wood). In urban contexts, upgrading textile, urban, and industrial waste streams into new secondary raw materials tested with industries in packaging, construction, food, clothing and plastics sectors (THESEUS), demonstrates how cities can function as multi-material resource hubs.

In island and rural areas, circularity often extends beyond industrial feedstocks into broader ecological systems. Organic residues from tourism, farming and households are transformed into renewable energy streams and soil-enhancing digestate, linking food systems, waste

management and local energy resilience (ICONIC). Mobile recycling infrastructures allow islands to process plastic and textile waste locally, turning them into co-designed products that circulate among residents, artisans and visitors (ReBoat). Meanwhile, digital wildfire-risk tools, participatory land stewardship models and shared mobility systems are deployed to reduce emissions, enhance forest resilience, and improve connectivity in sparsely populated territories—revealing how these solutions combine environmental management (forest, mobility, energy) with digital decision-support tools. (STORCITO).

In all cases, materials are treated not simply as physical commodities but as cultural and economic catalysts. Their transformation generates new interactions between engineers and artisans, farmers and technologists, municipalities and SMEs. In this sense, cross-circularity becomes an instrument for reconfiguring relationships between people, sectors and territories, and for shifting Europe away from extractive linearity toward regenerative value creation.

Across projects, digital tools emerge as a backbone for enabling cross-sectoral circularity through the development of AI-assisted material identification, C-BIM workflows, and interoperable material banks (SUM4Re), digital applications for wildfire-risk assessment, interactive forest-management systems, and shared-mobility platforms that connect municipalities, SMEs, and rural communities (STORCITO) as well as Matchmaking and pre-assessing, Digital Product Passports and spatial & logistics features for the facilitation of circular I-US synergies (THESEUS, Wood2Wood). Together, these tools enhance traceability, collaboration, and informed decision-making across circular value chains.

3. Replication potential and transferability

The experiences shared during the workshop illustrate that the replicability of circular solutions depends less on the uniformity of technologies and more on the adaptability of methodologies, governance arrangements and digital frameworks. Many of the approaches presented—mobile recycling infrastructures, modular processing lines, adaptable valorisation techniques, digital traceability systems and integrated governance models—were intentionally designed to be customisable across diverse geographical and socio-economic contexts (ReBoat; Wood2Wood; THESEUS; DeremCo; SUM4Re; ICONIC; STORCITO).

Replication is supported by structured documentation, open-access tools and transparent reporting. Several projects emphasise the importance of public deliverables, guidelines, methodological frameworks and training modules to support broader uptake. Open platforms for co-design with digital collaborative tools for co-design and coordination (ReBoat) and digital material banks (SUM4Re) enhance the transfer of knowledge and practice beyond projects' boundaries.

Nevertheless, replication is not without barriers. Technical challenges such as the lack of harmonised waste classification systems or insufficient sorting and valorisation infrastructure can slow implementation (Wood2Wood). Cultural and behavioural factors also influence replication, particularly where solutions rely on changes in local practices—for example, nature-based wildfire prevention measures that depend on specific livestock availability or land-use traditions (STORCITO). Financial obstacles, including the need for upfront investments in equipment or digital systems, present further barriers, especially for smaller municipalities or SMEs. Complementary and including many of the above, the local and regional settings, such as the structure of the economy and industry, the composition of

resources, infrastructure, utility networks, other local spatial characteristics and special challenges and regional strategies, are key factors to overcome obstacles, create real transferability conditions and create real impact via circular solutions within a region (THESEUS).

Successful transferability therefore requires flexibility: the ability to adjust technologies to local material streams, adapt governance models to institutional realities, and tune social engagement processes to cultural expectations. Projects highlight that accessible digital tools—such as material banks, traceability systems, and mobility/forest management apps—support replication.

4. Social, Community and Governance Dimensions

Circularity gains resilience and legitimacy when it is shaped by the people who live with its outcomes. Across the projects, social engagement emerged as a central enabler of success, with citizens, young people, creatives, students and local communities participating directly in defining the goals and processes of circular interventions. Hands-on workshops, living labs, co-design sessions and school-based initiatives contribute to a shared sense of ownership, transforming circularity from a technical exercise into a collective cultural activity (ReBoat; YouRban; THESEUS; ICONIC; STORCITO).

These participatory practices help communities understand the value of the materials around them and the potential of circular solutions to improve local well-being. For young people especially, involvement in design and transformation activities fosters creativity and skills that support future green employment pathways (YouRban, ReBoat, SUM4Re). In rural and island territories, co-design becomes a mechanism for strengthening identity and enhancing the legitimacy of circular reforms, particularly when they intersect with sensitive domains such as land use, water management or cultural heritage.

Long-term commitment from stakeholders hinges on transparent governance structures and durable collaborations. Multi-actor groups, public assemblies, neighbourhood committees, municipal working groups and digital tools such as material banks (SUM4Re), integration platforms (ICONIC), and collaborative co-design tools (ReBoat) support information sharing, monitor progress and adapt interventions over time (ICONIC; SUM4Re; W2W; DeremCo; STORCITO; ReBoat; YouRban). Trust is reinforced when stakeholders can access clear information—such as material traceability data, performance metrics or environmental impact results—and when they observe that their contributions lead to tangible outcomes.

Moreover, capacity-building efforts, whether through training modules, demonstrator activities or direct skills exchange, support continuity beyond project completion. When local actors acquire the competencies to operate new systems, maintain digital tools, or lead community engagement processes, circularity becomes embedded in the territory rather than dependent on project cycles.

5. Key Messages for Policy and Practice

The workshop discussions highlight that advancing cross-sectoral circularity requires enabling conditions that align technical innovations, governance structures, and social engagement. 5 key messages have been identified.

1. Strengthen regulatory frameworks for high-value material reuse:

Policy frameworks must support the high-value reuse of materials by improving classification standards, harmonising traceability requirements, and incentivising investments in sorting, valorisation, and digital infrastructure. Technical gaps—such as insufficient tracking systems or inconsistent waste categories—limit the flow of secondary materials across borders and sectors (Wood2Wood; SUM4Re). Without consistent regulatory guidance, regions and SMEs face barriers in adopting secondary materials and integrating them into existing value chains.

2. Support interoperable digital tools that connect multiple sectors

Circular solutions depend on interoperable digital systems capable of connecting multiple sectors. Tools such as material banks, AI-assisted identification systems, C-BIM workflows, mobility platforms, matchmaking modules and wildfire-risk applications demonstrate how digitalisation strengthens transparency and collaboration across industries and territories (SUM4Re; STORCITO, THESEUS). Also, enhancing interoperability and digital capacity can help regions coordinate complex material and resource flows.

3. Promote governance models that enable cross-sector collaboration and provide systemic solutions aligned to local conditions

Replication requires flexible governance models. The projects show that adaptable frameworks—such as multi-actor assemblies, neighbourhood committees, municipal working groups, regional Hubs for Circularity, and collaborative training structures—create environments where circular practices can be tailored to local needs and regional strategies(THESEUS; ICONIC; DeremCo; STORCITO; ReBoat; YouRban). These governance formats help embed solutions into long-term strategies rather than isolated pilot activities.

4. Prioritise participatory approaches that build trust and local ownership

Community involvement is essential in order to obtain a durable impact. Hands on codesign, co-creation workshops, participatory design labs, youth engagement programmes, and long-term stakeholder training build trust and ensure that circular interventions reflect social and cultural realities, acceptance and actual needs (ReBoat; YouRban; ICONIC; STORCITO; SUM4Re; THESEUS). Policies that support participatory processes can increase both acceptance and effectiveness of circular measures, while also transparent communication and shared digital tools also help maintain the stakeholder engagement in the long-term.

5. Reinforce economic viability by developing new circular value chains

Finally, projects demonstrate that creating viable circular markets—such as composite reuse pathways (DeremCo), wood valorisation chains (Wood2Wood), and circular tourism models (ReBoat)—supports the economic feasibility of replication and long-term adoption. Support mechanisms that de-risk experimentation and scale-up are critical to accelerate Europe's circular economy transition, while exhibiting clear value creation supports broader uptake and increases the likelihood of replication.

6. Conclusion

The workshop demonstrated that Europe's circular transition is strongest when technological, ecological, and social innovations evolve together. The participating Horizon Europe projects reveal how material flows—from composites and wood to textiles, plastics, and organic residues—can be reshaped into regenerative loops that cut emissions, strengthen territorial resilience, and stimulate new economic activity across cities, islands, and rural regions.

Across all cases, digital tools enhance coordination, governance structures improve cooperation, and community engagement grounds solutions in local realities. Replication depends not on copying technologies but on adapting methodologies, governance formats, and digital frameworks to regional conditions. When supported by clear policy signals, open data standards, and skills development, these approaches can be transferred widely and scaled effectively.

The outcomes of the workshop underline that circularity is not a single-sector transformation; it is a systemic shift requiring collaboration across value chains, administrative borders, industries, and communities. By building on the evidence and methods presented by ReBoat, THESEUS, DeremCo, Wood2Wood, SUM4Re, ICONIC, and STORCITO, European regions can move closer to climate neutrality while strengthening local economies and societal well-being.

Annex: Workshop Theme & Contributors

Title: Re-valuing resources: Cross-sectoral circular solutions for a sustainable future

This workshop explores how circular economy solutions contribute to Europe's decarbonisation and climate neutrality goals through real-world demonstrations across islands, cities, and industrial systems. It brings together eight Horizon Europe projects—ReBoat, THESEUS, DeremCo, Wood2Wood, YouRban, SUM4Re, ICONIC, and STORCITO—showcasing approaches in material reuse, urban regeneration, tourism and islands, wood and composites, robotics, and community engagement.

The session will exchange knowledge, explore synergies, and present replicable solutions that help transform linear value chains into regenerative systems. Discussion will also address policy barriers, digital and social enablers, and pathways to scaling.

Each project offers a unique angle:

ReBoat: modular, mobile waste treatment on a boat for islands, turning waste into products while co-creating sustainable "working holiday" models.

THESEUS Hub for Circularity (H4Cs) in cities and regions, integrating urban planning and regional strategies, governance models, citizen engagement, nature-based solutions, and industrial symbiosis.

DeremCo: demand-driven supply chain for composite reuse, with two reprocessing pathways, 14 SME-led pilots, and a digital platform linking waste owners, recyclers, and manufacturers.

Wood2Wood: transforms contaminated wood into products using digital tools, upcycling technologies, and life cycle assessments to support circular practices.

YouRban: mobile innovation plant in Milan and Barcelona, co-designing recycling and upcycling activities with citizens, especially youth and creatives.

SUM4Re: develops systemic solutions for circular and climate-resilient regions, linking material reuse, renewable energy, and sustainable value chains.

ICONIC: pilots integrated solutions for islands and rural communities, combining energy independence, circular practices, water and waste management, and sustainable mobility with strong multi-actor engagement.

STORCITO: creates nature-based and digital tools to support wildfire prevention, sustainable forest management, climate-neutral mobility, and community-based energy systems in rural Europe.

The session will identify common technical, governance, and social enablers for replication and investment readiness.

Innovations to be discussed include:

● Mobile and decentralised recycling infrastructures
● Urban circular innovation ecosystems

- Digital traceability for secondary materials
- Participatory co-design methods linking citizens with circular action
- Nature-based and community-driven climate resilience tools

This workshop highlights how locally adapted circular solutions deliver impact on decarbonisation, resource recovery, and resilience. It will showcase transferable tools, governance models, and opportunities for clustering, policy engagement, and replication across Europe.

Agenda:

5 Welcome & framing

60 Panel: Enablers, barriers & scaling

20 Audience Q&A

5' Wrap-up & next steps

Workshop contributors:

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