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Textiles Ecosystem Transition Pathway

Best practices report – Second Edition

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Executive Summary

This is the second Best Practices Report in the context of the Textiles Ecosystem Transition Pathway. It showcases ten innovative practices that are driving the ecosystem's transition towards sustainability, circularity, digitalisation, resilience and social responsibility, and which have been published on the [EU Textiles Ecosystem Platform](#) between August 2025 and January 2026.

The ten best practices demonstrate distinct innovation and digital transformation pathways for the industry. Four are collective actions led by partnerships, networks, or umbrella organisations operating from local to global scales. These include [BIOTEXFUTURE](#), which accelerates the shift to bio-based materials through funded research–industry collaboration; [Refashion](#), which demonstrates how a Producer Responsibility Organisation can evolve from compliance to broader ecosystem intervention; [Reverse Resources](#), which illustrates how digital platforms can connect manufacturers, waste handlers and recyclers to scale textile-to-textile recycling; and [CITEVE](#) which exemplifies the role of technology centres in supporting SMEs in adopting innovation and coordinating ecosystem-wide transitions.

Six are individual company innovations showcasing how sustainability and digital solutions can be embedded into business models and operations. These include [Lenzing](#), which integrates sustainability and circularity across fibre production and material innovation; [IKEA](#), which places circularity at the core of product design through structured guidelines; [Lindström](#), which applies a service-based model to extend textile lifetimes through repair, reuse and recycling; and [Ethletic](#), which integrates ethical and social responsibility throughout its footwear supply chain. Other practices highlight industrial symbiosis through waste-derived materials, as illustrated by [Orange Fiber and Sabant](#), and the optimisation of production processes through digital and AI-driven solutions to reduce cutting scrap, as demonstrated by [Lectra](#).

These practices address multiple areas of the Transition Pathway. They centre on sustainable competitiveness, research and innovation, and infrastructure development, while also dealing with skills, governance, investment, and cross-ecosystem impacts. Geographically, the selected examples span several European countries and involve a broad range of stakeholders, including large companies, SMEs, networks, cluster organisations and technology centres.

These examples demonstrate that the transition of the textiles ecosystem is already underway, driven by practical, scalable and diverse initiatives across the value chain.

Future editions of the Best Practices Report will continue to track the evolution of featured practices and identify new initiatives contributing to the objectives of the Textiles Ecosystem Transition Pathway.

Introduction

This second Best Practices Report is produced in the context of the Textiles Ecosystem Transition Pathway. It provides an overview of ten new illustrative best practices identified to support the ecosystem's transition towards sustainability, circularity, digitalisation resilience and social responsibility, and published on the EU Textiles Ecosystem Platform.

Following the [first Best practices report](#), this edition expands the collection by analysing the 10 new best practices published on the platform between August 2025 and January 2026, thereby offering a broader representation of the ongoing transition across the textiles value chain. The newly featured initiatives complement the examples in the first report and reflect the diversity of approaches, stakeholder types, and ecosystem segments that contribute to the Transition Pathway objectives.

By highlighting these practices, the report aims to serve as both a reference and an inspiration for stakeholders across the textiles value chain, supporting knowledge-sharing and the replication of successful solutions.

The report includes a presentation of the methodology used to identify, assess, draft, and validate the best practices; a high-level overview of all best practices published by the cut-off date; and a detailed presentation of each initiative.

Methodology

Best practices published on the [platform](#) are developed through a structured six-step process, as illustrated below.

Figure 1 - The process to develop best practices



Step 1. Identification

The consortium team identifies possible best practices from different sources:

- Pledges published on the platform: the team reviews the pledges and checks whether stakeholders have reported any implementation progress and target achievements. A pledge can be considered as a best practice either if it is completed, i.e., the expected actions have been implemented and the results are in line with expectations, or if there is clear evidence of progress and there are some initial results.
- Desk research: the team conducts focused desk research on specific topics relevant to the Textiles Ecosystem Transition Pathway. The desk research covers: industry publications, academic literature, and sustainability reports from key players across the textiles ecosystem. Desk research may also build on contacts and information acquired through field research, such as exchanges with stakeholders at fairs, conferences, and industry events, which help identify initiatives that are not yet widely documented.
- Consortium knowledge and suggestions: best practices may also be identified through the consortium’s own knowledge and through suggestions emerging from its professional network. These inputs build on sectoral expertise, long-standing contacts and continuous engagement with stakeholders, enabling the identification of promising and relevant best practices.
- Proposals from stakeholders in the textiles ecosystem: actors involved can submit best practices through the [platform’s dedicated page](#), by contacting the consortium team via email, or by engaging with them in events and fairs.

The table below highlights the sources of the ten new best practices published between August 2025 and January 2026 on the EU textiles platform and presented in this report. .

Table 1 - Sources of the best practices published between August 2025 and January 2026

Best practice title	Source
Lenzing: A Key Player in Sustainable Textile Innovation	Pledges ¹
Embedding circular thinking in product design: IKEA guidelines	Desk research ²
BIOTEXFUTURE: transforming the textile industry towards bio-based materials	Consortium knowledge and suggestions ³

¹ Pledge received by Lenzing.

² [IKEA](#)

³ Suggested by ITA Academy.

Refashion: from compliance mechanism to value chain intervention	Desk research ⁴
Lindström: a professional textile service model grounded in circular economy principles	Desk research ⁵
Driving Circularity Through Waste-Derived Materials in Textiles and Leather	Desk research ⁶
Ethletic: a practical approach to ethical and sustainable footwear	Desk research ⁷
Connecting actors of the textile value chain through digital platforms: the case of the Reverse Resources Platform	Consortium knowledge and suggestions ⁸
Technology centres as ecosystem orchestrators: the case of the Portuguese CITEVE	Consortium knowledge and suggestions ⁹
Optimising textile production: AI-Driven and process-oriented solution to reduce cutting scrap	Consortium knowledge and suggestions ¹⁰

Step 2. Assessment

To assess whether the identified initiatives qualify as best practices, the team applies a set of criteria agreed upon with the European Commission. Each initiative needs to meet at least two of the following criteria:

- **Replicability:** The initiative can be replicated or adapted by other organisations within the textiles ecosystem.
- **Sustainability:** The initiative demonstrates lasting effects over time.
- **Impact orientation:** The initiative includes measurable targets or indicators that quantify its contribution to the industry's green or digital transition, or to enhanced resilience and/or competitiveness.

Initiatives meeting the above criteria are then subject to a qualitative review conducted by experts within the project consortium before being selected as best practices.

Step 3. Drafting

If the assessment is positive, the team conducts thorough desk research to gather information about the action's implementation and its achievements. Official reports published by the involved stakeholders are a key source. The drafting process focuses on presenting information in a straightforward, accessible manner that enables platform users to understand what was implemented and how they might adapt similar approaches to their specific contexts. To enhance usability, the team includes direct links to sources, reports, and additional resources, allowing readers to access more detailed information and supporting materials when needed.

Step 4. Validation

⁴ [Refashion](#)

⁵ [Lindström](#)

⁶ [Orange Fiber](#) and Sabant

⁷ [Ethletic](#)

⁸ Suggested by Blumine.

⁹ CSIL's network

¹⁰ Suggested by CSIL.

Before publication, internal quality checks ensure that all best practices meet the established standards and are presented in a consistent way. When possible, subject matter experts review the technical accuracy of the information presented.

Step 5. Stakeholder notification

The consortium team informs the stakeholders involved in each initiative via email 5-7 business days prior to publication, providing advance notice of the content and publication date. Stakeholders can suggest changes to the text or integrate additional information.

Step 6. Publication

Validated best practices are published on the designated [platform section](#).

The methodology is designed to ensure quality and consistency throughout the process while maintaining transparency and stakeholder engagement. The approach also includes mechanisms for collecting feedback and improving based on lessons learned.

Between **August 2025 and January 2026**, the team published 10 new best practices on the EU textiles ecosystem platform using this approach.

Best practices overview

A snapshot of the best practices

The table below provides an overview of the ten best practices identified and published on the Textiles Ecosystem Platform between August 2025 and January 2026. It includes links to the relevant entries on the platform, the publication date, the main segment of the ecosystem covered by the best practice, and the best practice topic.

Table 2 - Snapshot of the best practices published between August 2025 and January 2026

Best practice title	Textiles Ecosystem Platform Link	Main ecosystem segment	Topic	Date of publication
1. Lenzing : A Key Player in Sustainable Textile Innovation	Lenzing	Fibres, yarns and fabrics	Recycled fibre innovation and sustainability measures	September 2025
2. Embedding circular thinking in product design: IKEA guidelines	IKEA	Household/interior textiles	Circular design	September 2025
3. BIOTEXFUTURE : transforming the textile industry towards bio-based materials	BIOTEXFUTURE	Fibres, yarns and fabrics	Bio-based materials	October 2025
4. Refashion : from compliance mechanism to value chain intervention	Refashion	Waste management, reuse and repair	EPR	October 2025
5. Lindström : a professional textile service model grounded in circular economy principles	Lindström	Technical textiles	Repair business model	November 2025
6. Driving Circularity Through Waste-Derived Materials in Textiles and Leather	Waste-Derived Materials	Fibres, yarns and fabrics	Industrial symbiosis and innovative materials technology	November 2025
7. Ethletic : a practical approach to ethical and sustainable footwear	Ethletic	Footwear	Ethical and sustainable footwear	December 2025
8. Connecting actors of the textile value chain through digital platforms: the case of the Reverse Resources Platform	Reverse Resources	Waste management, reuse and repair	Leftover fabrics for upcycling designers; Digital platform	December 2025

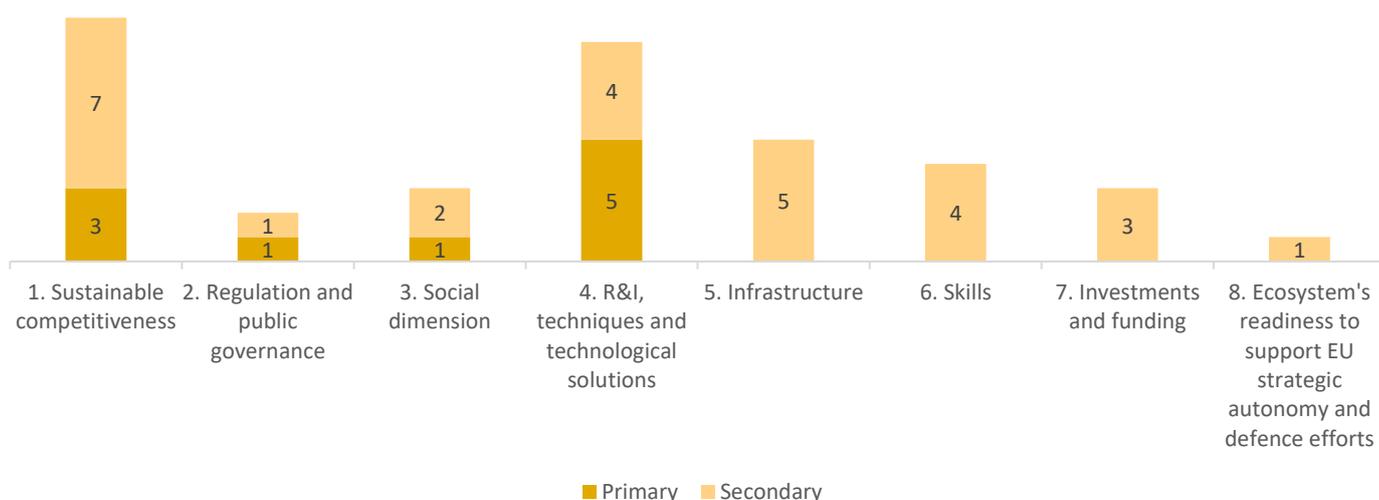
9. Technology centres as ecosystem orchestrators: the case of the Portuguese CITEVE	CITEVE	Research and Innovation	Technology centre/ecosystem orchestration	January 2026
10. Optimising textile production: AI-Driven and process-oriented solution to reduce cutting scrap	Lectra	Technology and Machinery	AI for production efficiency, sustainability and innovation	January 2026

Transition Pathway’s building blocks addressed

The published best practices cover several areas of the Transition Pathway. Each best practice was assigned to a ‘primary’ building block, where it has the most impact, and one or more ‘secondary’ building blocks, as shown in Figure 2.

Overall, the best practices relate primarily to sustainable competitiveness (building block 1) and R&I, techniques and technological solutions (building block 4). This is reflected in the strong emphasis on embedding sustainability into core business strategies, advancing circular and service-based business models, and deploying bio-based, digital and AI-enabled solutions. These efforts are often supported by enabling infrastructure (building block 5), such as Extended Producer Responsibility systems, digital platforms supporting recycling and traceability, and innovation and testing facilities designed to support SME adoption. The current selection shows a clear shift towards operational, scalable and measurable solutions, particularly those enabled by digitalisation and data-driven systems, rather than awareness-raising or exploratory initiatives. Social aspects (building block 3) are addressed mainly through ethical sourcing, fair labour practices and inclusive value-chain governance. In contrast, skills development (building block 6) plays a cross-cutting role, especially in relation to digital adoption, data management and innovation uptake by SMEs.

Figure 2 - Coverage of the Transition Pathway’s building blocks by the best practices published between August 2025 and January 2026

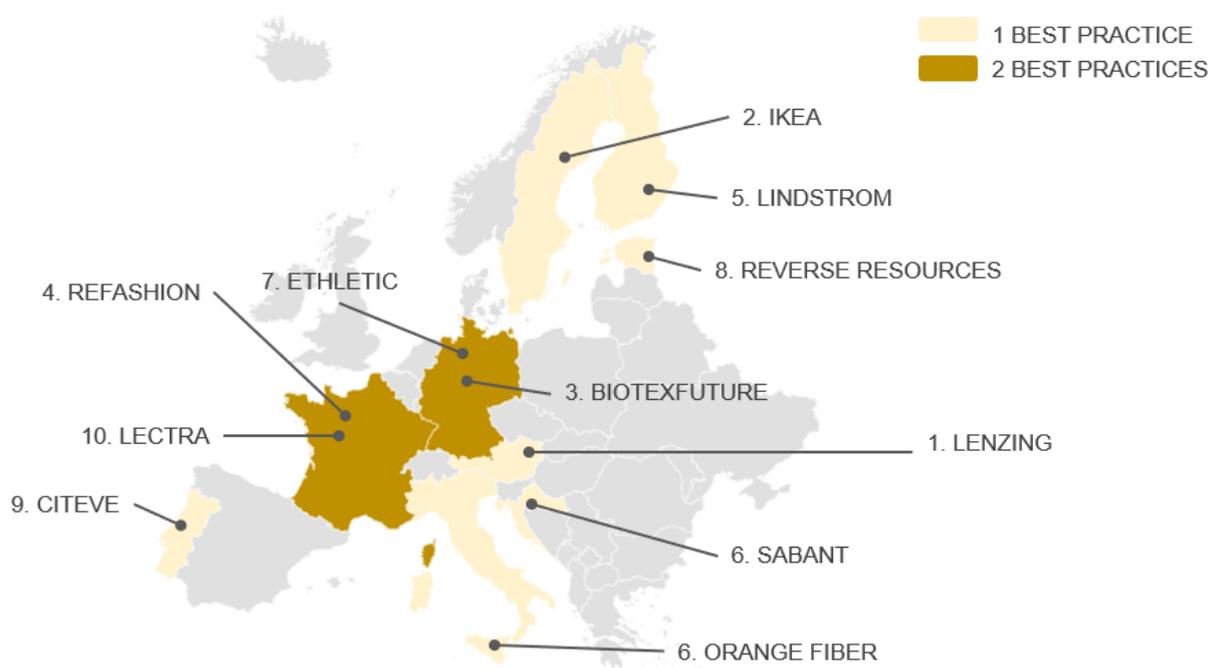


Geographic coverage

Each published best practice can be linked to a specific country based on the location of the main organisation leading the initiative. However, the impacts of many practices extend well beyond national borders, reflecting the global nature of textile value chains, including raw material sourcing, distributed manufacturing processes and international markets.

Figure 3 illustrates the geographical diversity of best practices across a broad range of European contexts. It includes initiatives rooted in local or national ecosystems, such as technology centres and EPR schemes, as well as company-led practices operating through international supply chains.

Figure 3 - Geographic coverage of the best practices published between August 2025 and January 2026



Types of stakeholders

Most published best practices involve multiple stakeholders, even when a single organisation serves as the leading promoter. In some cases, initiatives are explicitly collective actions led by networks, cluster organisations or non-profit entities with a mandate to represent or coordinate multiple actors. In other cases, individual companies lead the initiative while relying on partnerships with research organisations, technology providers, suppliers or public actors for implementation, testing or scale-up.

Figure 4 illustrates the types of organisations leading the ten best practices published during the period, highlighting the diversity of stakeholder profiles involved, ranging from large companies and SMEs - including textile companies (fibre producers, retailers, service providers) and technology providers offering digital solutions to the textile sector - to networks, cluster organisations (technology centres) and NGOs.

Figure 4 - Types of stakeholders leading the best practices published between August 2025 and January 2026



Some insights from the best practices

The ten best practices published on the platform during this reporting period demonstrate diverse approaches to industry transformation and highlight both collective action and company-led implementation as key levers supporting the transition. The current collection emphasises practical levers that can be institutionalised: governance mechanisms that steer behaviour through incentives, digital infrastructures that organise material flows, and technology or service models that embed circularity into daily operations.

Four of the practices (BIOTEXFUTURE, Refashion, Reverse Resources and CITEVE) are **collective actions** led by organisations with mandates that extend across the system. Operating at the national or European level, these initiatives address structural barriers to transition, such as fragmented value chains, limited access to innovation and testing infrastructure, and insufficient coordination across recycling, bio-based innovation, and data systems. BIOTEXFUTURE demonstrates how **structured research-industry collaboration** can accelerate the shift to bio-based textiles by funding a portfolio of projects that spans material development, finishing solutions, recycling pathways and even social acceptance factors. The combined leadership of a research organisation (i.e. ITA) and a company (i.e. Adidas AG) ensures that innovation progresses beyond laboratory scale and aligns developments with industrial performance requirements. Refashion shows how **Extended Producer Responsibility** can move beyond compliance to become a **value-chain intervention** tool. Through eco-modulated fees and dedicated funding streams, it supports collection and sorting capacity while also incentivising eco-design, recycled content, repair, reuse and recycling innovation. Reverse Resources aims to address the bottleneck caused by insufficient data exchange among stakeholders in the waste-recycling chain. It shows how digital platforms can map and steer production leftovers, match waste streams with recyclers' technical needs, and strengthen the feedstock reliability required for textile-to-textile recycling scale-up and future systems such as Digital Product Passports. CITEVE illustrates the role of technology centres as **transition infrastructure** for SME-based ecosystems. It combines accredited testing, prototyping and industrial validation with cluster coordination. This helps companies reduce adoption risk for new materials, processes and compliance requirements. It also supports their diversification into specialised technical textiles for sectors such as defence, automotive, and construction.

Alongside these collective initiatives, six best practices are **single-actor actions** led by companies. These examples illustrate how sustainability and innovation can be embedded in products, processes and business models along different stages of the value chain. Lenzing exemplifies a **comprehensive fibre producer approach** that combines responsible sourcing, cleaner production and decarbonisation pathways with circular innovations that integrate recycled textile content into new fibres. IKEA highlights the **role of design** as a strategic lever, translating circular principles into structured guidelines that influence durability, reparability, adaptability and recyclability. The guidelines also address the material footprint of textiles by increasing recycled content and using alternative fibres. Lindström demonstrates how a service-based model

can deliver **circular outcomes** in professional textiles by retaining product ownership, investing in systematic repair and take-back systems, and operationalising circularity through industrial laundering infrastructure and end-of-life routing. Orange Fiber and Sabant are two different examples of companies **transforming by-products of other sectors** (i.e. agriculture) into innovative materials, in line with the concept of industrial symbiosis. Their experiences also underline the importance of partnerships with established brands to achieve market acceptance. Ethletic adds a strong **social dimension** through fair-trade-certified materials, mechanisms supporting fairer wages and transparency, and repair services that extend product life. Lectra provides **digital solutions** also for the textile sector and demonstrates how AI-driven optimisation can reduce production waste, despite constraints such as investment needs, interoperable data, and workforce upskilling.

Taken together, these best practices provide replicable examples across multiple stages of the textile lifecycle, from raw material sourcing and fibre production to manufacturing, distribution, use, repair and end-of-life management. Overall, the practices show that progress towards the Transition Pathway objectives is being driven by both ecosystem-level mechanisms that reduce fragmentation and company-level actions that translate those mechanisms into tangible operational change.

Best practices in detail

1. Lenzing: A Key Player in Sustainable Textile Innovation



Lenzing stands out as a prime example of a company embracing sustainability as an integral part of its business strategy and a driver of innovation. Lenzing's commitment to sustainability is guided by a holistic approach that spans its entire value chain, from sustainable wood sourcing to responsible production processes and the promotion of circular economy principles. This comprehensive strategy, backed by ambitious Science-Based targets and groundbreaking innovations, positions Lenzing as an exemplary case in the man-made fibres sector. Lenzing's achievements are recognised by international ratings and awards.

Lenzing, an Austrian producer of wood-based cellulosic fibres (viscose, modal, and lyocell), stands out as a leading European company integrating sustainability as a core business strategy and driver of innovation.

A Holistic Approach to a Greener Value Chain

Lenzing's commitment to sustainability is comprehensive, spanning its entire value chain. This begins with responsible sourcing: over 99% of its wood and pulp come from certified (FSC® or PEFC™) or controlled sources, ensuring forest health, biodiversity protection, and community respect.

In production, Lenzing prioritises efficiency and environmental soundness. Its TENCEL™ Lyocell fibres are produced in a closed-loop system, recovering and reusing over 99% of solvents. The company also invests in advanced wastewater treatment and air emission controls. Furthermore, Lenzing is transitioning to cleaner energy, achieving 100% green electricity at four sites by 2024, phasing out coal in its Nanjing (China) operations, and increasing renewable energy consumption across the Group. LENZING™ fibers are certified with the EU Ecolabel for Textile Products - the EU official voluntary label for environmental excellence.

Lenzing extends its sustainability commitment to suppliers, monitoring them through assessments like EcoVadis and audits by Together for Sustainability. These efforts covered approximately 60% of Global Procurement spend in 2024, including wood and pulp.

Science-Based Targets: A compass for climate action

Recognising the urgency of climate change, Lenzing was one of the first fibre producers to have its climate targets validated by the Science Based Targets initiative (SBTi). These targets align with the Paris Agreement, aiming to limit global warming to 1.5°C. Starting from these targets, Lenzing has developed and published [pledges](#) on EU Textiles Ecosystem Platform.

Continuous monitoring and reporting ensure transparency and accountability.

Innovation for Circularity

Lenzing is at the forefront of innovations designed to reduce waste, maximise resource utilisation, and facilitate textile recycling.

Its groundbreaking REFIBRA™ technology upcycles cotton textile waste into new TENCEL™ Lyocell fibres. This success has led to the global availability of LENZING™ ECOVERO™ fibres, which incorporate up to 20% recycled content from pre- and post-consumer textile waste.

Another innovation is a resource-efficient dyeing approach for TENCEL™ Lyocell fibres. This method uses yarn pretreatment and a knitting technique to achieve a "washed-out" aesthetic with a lower environmental impact than conventional dyeing.

Lenzing also actively collaborates on textile recycling projects, such as the 2024 partnership with Recyc Leather to combine recycled leather fibres with TENCEL™ Lyocell fibres for footwear, utilised by the Danish brand GANNI.

Recognised Achievements

Lenzing's dedication to sustainability has earned it numerous awards and rankings. In 2024, it received one of the best scores in Canopy's Hot Button Ranking for forest sourcing and was awarded Platinum status by EcoVadis. The same year, it won the Biodiversity and Water Award at the CNMI Sustainable Fashion Awards and the VÖNIX Sustainability Award from the Vienna Stock Exchange in the "Industrials" category.

Conclusion

Lenzing's comprehensive and innovative approach demonstrates that environmental stewardship and business success are mutually reinforcing. By integrating science-based climate targets, pioneering circular innovations, and adopting a holistic view of its value chain, Lenzing has established itself as a benchmark in the textile man-made fibre industry's transition towards a more sustainable future.

2. Embedding circular thinking in product design: IKEA guidelines



IKEA success lies not only in its global reach and affordability, but in the way design is treated as a strategic enabler of sustainability and circularity. By placing the design phase at the core of its transition, IKEA acknowledges that decisions taken at this stage determine product durability, reparability, adaptability, and end-of-life options. Over the years, the company has translated this vision into structured guidelines and practical tools, such as the Circular Product Design Guide, making circular design principles accessible to both its internal teams and the wider design community. This systematic approach positions IKEA as a reference point for integrating design-driven innovation with circular economy objectives

Design as a distinctive factor and an enabler of circularity

IKEA is recognised worldwide for its extensive range of products, including furniture, mattresses, accessories, and home textiles. What has made IKEA successful globally is not only its affordability, but also the way **design lies at the heart of its strategy**, serving as a distinctive feature that combines functionality, aesthetics, and scalability in ways that reach millions of households. Moreover, IKEA places particular emphasis on the design stage as a key lever to achieve its circularity goals, recognising that decisions made at this stage have a cascading impact on how long products last and what happens to them at the end of their life cycle.

IKEA Circular Product Design Guide

In 2017, IKEA began developing its **Circular Product Design Guide**, a set of internal guidelines for circular product development. In the process of implementing its circular design guidelines, IKEA assessed its 10 000 products, and in 2024, it published the third revision of the [Guide](#). The guidelines have been made available to designers and the broader public through a free [Interactive tool](#).

The Guide covers design for renewable and recycled materials, standardisation, care, repair, adaptability, remanufacturing, and recyclability. Interestingly, IKEA, which pioneered the ready-to-assemble model, is now extending this concept to circularity by adopting the ‘design for disassembly and reassembly’ concept. The idea is that products can be taken apart, moved, repaired, and adapted to different life stages.

Reducing the environmental impact of textiles through design and materials selection

Textiles account for 6% of the total materials weight consumed by IKEA. The company uses them in a wide range of products, including bed linen, tablecloths, curtains, rugs, towels, sofa coverings, as well as comfort materials (polyester, polyurethane, natural fibres, etc.) in sofas and mattresses.

The [IKEA Sustainability Report, FY24](#) highlights that **textile materials represent a significant share of the company’s environmental impact**, contributing to 18% of its climate footprint (in tonnes of CO₂eq) due to their resource-intensive growing practices, production processes, and petroleum-based chemicals in synthetic fibres and foam. As such, IKEA continually explores ways to increase recycled content and reduce textile waste, starting from the design phase of its products. Examples include:

- The launch of a new line of curtains, designed using **textile-to-textile** recycled content, derived from pre-consumer PET textile waste.
- The design of some bed linens with up to 20% of **recycled cotton**, and, since 2024, of bedspreads with up to 40% of recycled cotton. Cotton is recovered from cotton waste, such as yarns, fabrics, and garments, sourced according to the Global Reporting Standard.

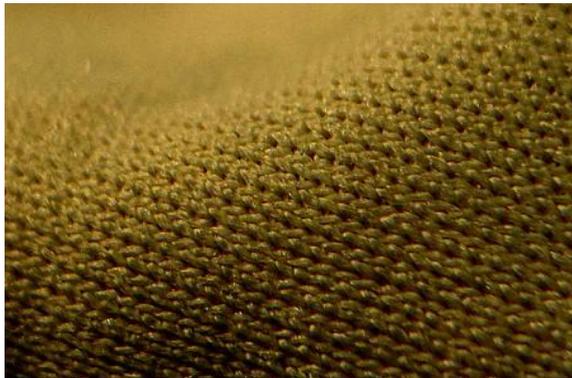
- The introduction of cottonised jute for specific products in the table setting range, as an alternative material with a lower climate footprint compared to virgin cotton, and ongoing research on **bast fibres**.
- The piloting of a **foam-less sofa** designed using IKEA's circular design principles. This is made with thermo-bonded felt made from fabric waste, including mixed fibres and blends, from IKEA production waste and other used textiles.

Conclusion

As many studies highlight, around **80% of a product's environmental impact is influenced by decisions made at the design stage**¹¹. The IKEA case demonstrates that circular design guidelines are useful tools to accompany an organisation, and the designers within it, in a transition to a more circular approach to business while meeting market demand for more sustainable products.

¹¹ <https://www.ellenmacarthurfoundation.org/news/an-introduction-to-circular-design>

3. BIOTEXFUTURE: transforming the textile industry towards bio-based materials



BIOTEXFUTURE is one of the four bioeconomy innovation spaces funded by the former German Federal Ministry of Education and Research - BMBF (now Ministry of Research, Technology and Space) to support research-industry collaboration and develop cross-sector bio-based innovations. Since 2019, BIOTEXFUTURE has funded 20 projects developing bio-based alternatives for the textile sector, from algae-derived biopolymers to fungal-based solution for dyeing. All research projects in the portfolio work together to achieve the overarching vision to convert the textile value chain from petroleum-based to bio-based. Through its members, BIOTEXFUTURE has created the largest network for textile bio-economy in Germany.

[BIOTEXFUTURE](#) is an open innovation platform where companies, universities, research institutes, and associations collaborate to accelerate the transition of the textile industry from petroleum-based to bio-based materials. Members of BIOTEXFUTURE can submit project proposals and receive public funding from the German Federal Ministry of Education and Research (BMBF). They also participate in networking events, knowledge exchange, and joint research activities within a protected environment governed by a non-disclosure agreement (NDA).

A clear vision for industry transformation

BIOTEXFUTURE's mission is to reduce the global dependence on synthetic, petroleum-based fibres that cause environmental, social, and economic problems. The initiative aims to transform the textile value chain by developing sustainable bio-based raw materials, mapping their application from biopolymer to finished textile, and addressing the broader societal transformation towards bioeconomy.

Structured research for systemic change

Since its launch in 2019, the initiative has funded 20 research projects across five key areas:

- Substrate and Material Development: for example, the [BioBase project](#) replaced petroleum-based materials with biopolymers, achieving equivalent performance in sportswear, automotive, and interior textiles.
- Product and Process Development: for example, the [BioTurf project](#) created artificial turf from biopolyethylene using thermobonding technology, now operational as a demonstration pitch in Aachen.
- Textile Finishing: for example, the [BioCoat project](#) developed protein-based coatings, achieving 99.998% bacterial reduction and moisture management over ten wash cycles without hazardous chemicals.
- Circular Economy: for example, the [CircWool project](#) established solvent-based recycling, converting wool waste into pure keratin fibres.
- Social Development: for example, the [TransitionLab project](#) researches technology acceptance, consumer behaviour, and ethical-legal aspects to facilitate societal transformation toward bioeconomy.

Conclusion

BIOTEXFUTURE's management structure demonstrates the value of cross-sector collaboration. The Institute of Textile Technology (ITA) and the Institute of Sociology at RWTH Aachen provide research leadership, while

Adidas AG leads as industry partner. This configuration ensures that research remains grounded in practical market requirements while maintaining scientific rigour.

BIOTEXFUTURE functions as a coordinated innovation space rather than isolated projects, fostering sustained collaboration that connects laboratory developments with market readiness while tackling barriers to bio-based fibre adoption. Open to organisations worldwide at no cost, it offers a protected environment for sharing knowledge and exploring opportunities beyond traditional competitive boundaries. In this way, BIOTEXFUTURE has created Germany's largest network for textile bio-economy.

4. Refashion: from compliance mechanism to ecosystem enabler



France is a pioneer in Clothing, Household, Linen and Footwear Extended Producer Responsibility (EPR), introducing the first scheme in 2007 and progressively strengthening it with eco-modulation incentives, repair and reuse funding and R&D programs for recycling, aiming to achieve higher circularity in the textile and footwear sector. Refashion, the national Producer Responsibility Organisation (PRO), now includes over 14 000 member entities and ensures the collection of around one-third of France's textile and footwear waste (calculated in relation to the products placed on the market each year). Refashion functions as a collaborative platform that connects producers, collectors, sorters, and recyclers, fostering the synergies essential for sector-wide change.

Extended Producer Responsibility management and circularity

Among the 28 EPR (Extended Producer Responsibility) schemes for textiles recently mapped by the [Global Fashion Agenda](#), the one in France is the oldest. In 2007, the country became the first to adopt EPR as a policy tool to tackle textile waste from products at the end of their life cycle.

The [2020 AGEC law](#) strengthened this framework with eco-modulation incentives, funding dedicated to repair and reuse, as well as R&D programs to boost recycling. More recently, in June 2025, the Parliament tabled a draft bill introducing financial penalties on ultra-fast fashion items through eco-modulation which has not yet been formally adopted.

Refashion, a capillary and widespread waste collection

[Refashion](#), the PRO (Producer Responsibility Organisation) covering apparel, footwear and household linen, has been active for more than 18 years. Although France allows individual compliance in EPR management, 95% of the market players are registered members of the Refashion collective compliance scheme, testifying to the successful uptake of the organisation. As of 2025, Refashion counts over 14 000 members, and 610 partnerships with local authorities.

Through its network of sorting and collection partners - mainly from the social economy - Refashion ensures coverage of one textile drop-off point per 1 400 inhabitants on average. In 2024, it collected around one third of the textile and footwear waste generated annually in France (calculated in relation to the products placed on the market each year), equivalent to almost 300 000 tons of end-of-life clothing, footwear and household linen (additional data available [here](#)). Around 200 000 tons of this waste stream were sorted.

Beyond waste management

Initially born to financially support the collection and sorting of discarded textiles, the French EPR scheme has progressively evolved to address waste prevention and achieve higher circularity through local reuse, repair and recycling.

Refashion is funded through eco-fees paid by producers. These resources are allocated according to the [EPR specifications](#): for collecting, sorting, and processing used textiles and footwear (29%) and to fund incentives that reward sustainable design practices (20%). Additionally, Refashion supports repair programmes and reuse initiatives (23%). Beyond compliance administration, Refashion manages mandatory waste prevention plans, funds initiatives on traceability improvement for sorting operators activities, and operates the Refashion Recycle platform, which connects circular supply chains. It also allocates funding for research and development activities on automated sorting and recycling (5%).

Incentive for ecodesign in practice

Refashion applies an incentive scheme that encourages circular design through monetary benefits. These can be linked to product durability, environmental certifications (GOTS, Oeko-Tex Made in Green, European Ecolabel), or the incorporation of recycled materials. Conversely, recyclability penalties target metalloplastic fibres and electronic components, with amounts detailed by product line.

Conclusion

While EPR schemes alone might not solve systemic issues such as overproduction or infrastructure bottlenecks, Refashion demonstrates how a PRO can go beyond compliance to drive innovation, cooperation and investment towards circular clothing household, linen and footwear. France's experience provides valuable lessons to other Member States for the implementation of the upcoming EPR for textiles included in the EU Waste Framework Directive. Member States will have to establish EPR for textiles by February 2028.

5. Lindström: a professional textile service model grounded in circular economy principles



Lindström is a Finnish company that provides rental and maintenance services for professional textiles. Its business model illustrates how service providers can reduce waste, extend product lifetime, and deliver measurable environmental benefits when supported by robust infrastructure and long-term investment.

Introduction

In the transition toward a circular textile economy, service and rental-based business models are increasingly recognised as effective ways to extend product lifecycles, improve resource efficiency, and reduce waste. Because **service providers remain responsible for the product throughout its entire lifecycle** - unlike in other segments where responsibilities are fragmented - they have complete visibility over product performance. They can make coherent, environmentally aligned decisions on design, maintenance, logistics, and end-of-life management. Retaining ownership also creates a direct economic incentive to ensure durability, proper maintenance, and efficient handling. This model is particularly prevalent in markets where textiles are used for professional or industrial purposes.

Lindström at a glance

Lindström is a Finnish, family-owned textile service company. Established in 1848, it now operates in 24 countries across Europe and Asia, with over 88 000 customers, 21 million pieces of textiles in circulation, and over 200 000 tons of textiles washed per year (data for 2024 available [here](#)). The company supplies textiles for industrial workwear, cleanrooms, hospitality, healthcare, restaurants, retail environments and other professional markets. Lindström generally maintains ownership of all items, managing them end-to-end, from procurement and design through to washing, repair, and end-of-life processing.

A comprehensive approach to sustainability and circularity

Circularity is integrated across the company's operations. Lindström emphasises **durability and repairability in the design phase**, choosing materials and construction techniques that withstand repeated washing, handling and use. The company's efforts also target the reduction in the use of virgin materials: purchased textiles with recycled content stood at 36% in 2024 (doubling from the previous year).

Products are tested for longevity and **maintained through systematic inspection and repair processes**. The company, for example, was able to repair around 4.5 million textile workwear items in a single year, extending product life and reducing the need for new production.

When textiles can no longer fulfil their primary function, the company channels them into reuse in lower-grade applications or into recycling processes where possible. In 2024, 70% of textile waste was recycled, thanks to dedicated sorting, reuse, and recycling systems. The recycling rates vary across segments (i.e., from 100% in restaurant textiles to 71% for workwear). Recycling pathways include converting the material into fibres for new textiles, industrial applications, or other materials such as insulation or filling products.

In the maintenance process, **specific attention** is also given **to resources**: the company's industrial laundry facilities are designed **to optimise water, energy, and chemical use**. Current water usage per washed textile kilogram is 7.08 lt/kg, diminishing from the 2020 value of 7.48 lt/kg. Focused efforts are put on regions experiencing water stress, where laundries are prioritising water-saving technologies, recycling systems and operational adjustments to reduce water consumption.

Priority actions towards 2050 net-zero target lay on decarbonising the laundry operations, delivery service and supply chain together with partners. In 2024, the company reported a -7% reduction in total greenhouse gas emissions compared to the previous year.

The overall company's efforts towards sustainability and social responsibility have been recognised by an EcoVadis Platinum rating, as well as multiple awards from the European Textile Services Association ([ETSA](#)) for Corporate Social Responsibility, Customer Experience, and Employer of the Year.

A bridge between manufacturers and end users

The company collaborates with customers to design solutions that promote the efficient use of textiles and facilitate structured end-of-life handling. It also engages with manufacturers to enhance product durability, repairability, and recyclability by testing materials and applying eco-design principles. At the industry level, Lindström also contributes to shared initiatives through the European Textile Services Association (ETSA), participating in working groups and common projects. With these forms of cooperation, **the company helps in the promotion and alignment of green practices within the whole ecosystem.**

Conclusion

The textile service/rental industry still consumes resources such as water, energy for laundering, transportation, and chemicals. However, Lindström's experience demonstrates how a service-based approach can deliver important **environmental benefits** as well: **reduced waste and overproduction, extended product lifetime, and resource savings.** By integrating durable design, efficient industrial laundering, systematic repair processes and structured take-back and recycling systems, the company provides a replicable example of how the textile sector can advance toward circularity. These results also highlight how service models can achieve measurable improvements when implemented consistently and supported by adequate infrastructure, data monitoring and long-term investment.

6. Driving circularity through waste-derived materials in Textiles and Leather



The textiles and leather industries are embracing innovation to enhance circularity by transforming waste from other sectors into valuable materials. This approach reduces landfill waste, conserves virgin resources, and lowers environmental impact. Key to success are abundant waste streams, scalable conversion methods, and strong industry partnerships. European pioneers like Orange Fiber and Sabant are commercialising luxurious fabrics from citrus waste and leather alternatives from barley malt, proving waste valorisation can meet market demands and drive a circular economy.

Innovation is crucial for reducing the environmental impact of the textile and leather ecosystem. One significant way innovation is improving the circularity of this ecosystem is by **transforming waste from other production processes into new, innovative materials**. This circular approach, known as industrial symbiosis, not only diverts waste from landfills but also reduces reliance on virgin resources, minimises ecological footprints, and fosters a more sustainable and resilient supply chain.

Key principle for waste valorisation from other value chains

For waste valorisation to be truly effective, some key principles must be considered:

1. Prioritise waste streams that are abundant, consistent, and geographically accessible. This ensures a stable and reliable supply of raw material for continuous production.
2. Invest in research and development to create scalable and environmentally sound methods for extracting and transforming waste components into usable fibres or materials. This ensures that the solutions are both effective and sustainable.
3. Foster strong partnerships between waste generators, material innovators, manufacturers, and brands. Such collaborations are essential for effectively integrating new materials into products and bringing them to market.

In the textiles and leather ecosystem, innovation in this field primarily concerns waste from the food and agriculture supply chain. This includes materials like fruit and vegetable waste, agricultural by-products, dairy waste, distillery waste, and mushrooms. Some European innovators in the textiles and leather ecosystem have invested in innovations that leverage on the industrial symbiosis concept and have commercialised these new materials, demonstrating their viability and potential. Two examples are Orange Fiber and Sabant.

Orange Fiber: From Citrus Peels to Luxurious Fabric

[Orange Fiber](#) is an Italian company, founded in 2014, that transforms cellulose extracted from discarded citrus fruit peels, a massive by-product of the juice industry, into a luxurious, silky fabric.

The company's patented process turns this agricultural waste into a soft, lightweight, and breathable material. This fabric is not only vegan and biodegradable but also offers a beautiful drape, making it suitable for high-end fashion. The company registered its cellulose extraction licence in 2014, in Italy, and subsequently extended it to the main citrus juice-producing countries, with the intention of applying its technology in the most promising markets. In 2014, they registered their Trademark, which identifies products containing their exclusive yarns and fabrics.

At their production sites in Sicily, Orange Fiber obtains cellulose from citrus pulp. Thanks to a partnership with the Lenzing Group, the citrus pulp is processed into a textile fibre that combine orange and wood pulp: TENCEL™ Limited Edition x Orange Fiber. This fibre is then transformed into yarns in the factories of Pozzi Electa. Finally, the company work in synergy with textile companies such as Tessitura Serica Taborelli and

Tessuti di Sondrio of the Marzotto group to develop their fabric collections. Orange Fiber has achieved significant market acceptance through collaborations with brands such as Salvatore Ferragamo, H&M, and Marinella and has been awarded several international awards.

Sabant: Crafting Skins from Barley Malt

[Sabant](#), a Croatian company founded in 2021, is pioneering the transformation of barley malt – a substantial by-product of alcohol production – into innovative leather-like materials. Breweries and distilleries globally generate vast quantities of spent grain, which typically ends up as animal feed or waste. Sabant's innovation intercepts this valuable by-product, giving it a new life as a durable and versatile material.

Their patented technology, filed in 2023, meticulously converts these residual grains into a material that effectively mimics the feel and performance of conventional leather. Sabant currently produces distinct "Gin Skins" and "Beer Skins," each with unique characteristics derived from their specific waste sources. While these products are already on the market, the company's research and development efforts are ongoing, continually exploring new formulations and launching additional types of skin. These "Gin Skins" and "Beer Skins" offer a vegan material for a wide range of applications, from fashion accessories to upholstery.

Sabant's commitment to sustainability extends beyond waste valorisation. By utilising a common industrial waste product, they significantly reduce overall waste and minimise environmental impact through a localised sourcing, processing, and production chain. This is exemplified by their partnership with Zagreb's own Zmajka brewery, which provides them with the raw plant matter needed for their innovative materials.

Conclusion

Both Orange Fiber and Sabant have successfully developed materials that meet the performance and aesthetic expectations of traditional textiles and leathers, accelerating market acceptance. They demonstrate how agricultural waste and by-products can be transformed into desirable, sustainable textiles and leather-like materials, providing an alternative to traditional fibres and reducing the environmental burden of both the food and fashion industries. By re-imagining waste as a valuable resource, the textile and leather industries can unlock new material possibilities, enhance their sustainability credentials, and drive a truly circular economy.

7. Ethletic: a practical approach to ethical and sustainable footwear



Ethletic is a German sneaker brand that puts fair-trade, sustainable and ethical production at the core of its supply chain. In 2004, Ethletic commercialised the world's first sneaker certified with the Fairtrade seal for fairly traded organic cotton. Since then, Ethletic has expanded its supply chain, developed new sneakers made of Fairtrade materials, launched repair services to increase the sneakers' life, and introduced mechanisms to ensure fairer wages for producers.

A Sneaker with a Story

[Ethletic](#) began in 1998 with the launch of the world's first Fairtrade-certified soccer ball. The brand has since expanded into footwear, producing sneakers that emphasise ethical manufacturing. Ethletic regularly collaborates with artists, musicians, designers, and activists on limited editions and campaigns focused on fairness, sustainability, and cultural exchange. These partnerships serve to communicate the brand's values and connect with different audiences.

A Commitment to Sustainability

Ethletic's sneakers are manufactured using recycled rubber, organic cotton, and natural materials sourced from sustainable plantations. The soles use FSC-certified rubber, and the organic cotton is Fairtrade-certified. The brand continues to use low-impact materials as part of its approach to reducing carbon emissions and textile waste.

In 2019, Ethletic began offering a discounted repair service through a partnership with [Sneaker Rescue](#), a Berlin-based startup that specialises in restoring worn and damaged sneakers. This service is designed to extend the lifespan of each pair.

Ethical Production for Fairer Wages

Ethletic's sneakers are produced in Pakistan under fair working conditions, with workers receiving living wages and access to benefits through the [Talon Workers Welfare Society](#), an organisation founded in 1998 as an NGO to improve working conditions for factory employees in Sialkot, Pakistan. This organisation empowers workers to decide how premiums from sneaker sales are allocated, funding local education, healthcare, and community projects.

In 2019, Ethletic introduced the "tip me" digital micro-donation system, which enables customers to send tips directly to workers. Each tip is transferred in full to the worker's phone, establishing a direct connection between consumers and producers.

Vegan and Animal-Friendly

Ethletic's products are PETA-approved vegan, using materials that do not involve animal products or testing. This approach aligns with the brand's focus on ethical production methods that consider both environmental sustainability and animal welfare.

Conclusion

Ethletic's business model incorporates sustainable material sourcing, fair labor practices, product repair services, and direct consumer-producer connections. These elements represent the company's approach to

ethical footwear production and its position within the footwear sector's development towards more responsible business practices.

8. Connecting actors of the textile value chain through digital platforms: the case of the Reverse Resources Platform



Reverse Resources is a digital platform that enables circular practices in the global textile industry by mapping, tracking and steering production leftovers towards high-value textile-to-textile recycling. By enhancing transparency, connecting previously disconnected actors and optimising the match between available waste streams and recyclers' input needs, the platform demonstrates how digitalisation can unlock unused material flows and support the scaling of economically viable circular solutions.

The Reverse Resources Platform development

[Reverse Resources](#) is an SME founded in 2014 from Estonia. Initially conceived as an online marketplace for leftover fabrics for upcycling designers, the company soon realised that the challenge within the global fashion value chain was not a lack of platforms, but the absence of reliable and traceable data on production waste, particularly cutting scraps.

For its first five years, the organisation operated largely as a research and mapping initiative, working with brands, factories, waste handlers and recyclers to understand where waste arose, in what quantities, how it was processed and why it often failed to reach textile-to-textile (T2T) recycling. They estimated that, even after process optimisation, over 25% of resources still spill out of original supply chains for a variety of reasons.

Building on this groundwork, **Reverse Resources progressively developed a Software-as-a-Service (SaaS) platform designed to digitally and transparently track textile waste along global fashion supply chains.** This work evolved into today's fully operational platform, which currently connects 1 211 manufacturers, 239 recyclers, 166 waste handlers and 18 global brands, monitoring their waste flows.

How the Reverse Resources Platform supports circularity?

The platform **connects actors across the textile ecosystem** by creating a structured digital environment in which they can interact and share information. It digitally tracks waste as it moves from suppliers (organisations generating waste and providing detailed information on its composition, quality and origin), waste handlers performing fibre sorting, quality checks, volume aggregation or shredding, and recyclers producing recycled fibres or materials. This creates a comprehensive and continuously updated picture of available waste: its type, composition, volume and geographical distribution.

This visibility enables **smarter matching between available waste and recyclers' needs.** With a global and constantly updated view of materials, recyclers can identify waste streams most closely aligned with their input requirements. Reverse Resources focuses particularly on diverting pre-consumer manufacturing waste with high potential for high-value textile-to-textile recycling, preventing it from being downcycled or landfilled.

Furthermore, through its backend logic, the platform helps users assess partners, verify data and determine the most suitable commercial or operational relationships, thus supporting **informed decision-making throughout the matchmaking process.**

Thanks to the company's strong technical background and the potential of digitalisation, Reverse Resources absorbs much of the underlying complexity of waste-data management. This allows users to integrate the platform into their daily operations, **making traceability a natural by-product rather than an administrative burden.**

The Impact

The company collaborates with global brands such as H&M Group, C&A, Bestseller and PVH Corp. (Calvin Klein, Tommy Hilfiger), as well as several other leading fashion companies, and it has established numerous partnerships across the ecosystem, for example with Global Fashion Agenda (GFA) through the Circular Fashion Partnership, and with Fashion for Good projects.

Overall, Reverse Resources has traced over 100 000 tonnes of textile waste through its platform, with around 50% successfully directed to textile-to-textile recycling (source: [Fashion for Good](#)). In 2022, the platform helped nearly 4 000 tonnes of waste reach high-end textile-to-textile recycling.

The service offered met a market need and this has allowed the company to grow between 2019 and 2024 the number of employees almost tripled and revenue from service provision increased more than ten-fold. In parallel, the company is developing and adapting its tools for post-consumer waste streams with the aim of integrating them into future circular systems.

Conclusion

As textile-to-textile recycling technologies scale towards capacities of several hundred thousand tonnes per year, the demand for stable, high-quality feedstock is rising rapidly. Reverse Resources addresses this challenge at its origin. Beyond reporting, this real-time data infrastructure enhances decision-making and integrates with emerging systems such as Digital Product Passports and Global Recycled Standard (GRS) certification. Such digital foundations are essential not only for building an effective circular economy at scale, but also for enabling broader Industry 4.0 applications.

9. Technology centres as ecosystem orchestrators: the case of the Portuguese CITEVE



Technology centres support SMEs in translating innovation from R&D to pilot testing and industrial deployment, particularly in fragmented value chains such as textiles. By providing shared infrastructure, applied research capabilities and validation services, they enable firms to adopt new technologies faster and with lower risk.

A [recent study](#) mapped ninety technology centres across Europe active in the textile sector. CITEVE, in Portugal, is one such centre and illustrates how the combination of advanced laboratory infrastructure, applied research and product development, technical services and coordination capacity can support both the digital and green transitions.

A sector under transition pressure: why is coordination capacity needed?

Portugal's textile and clothing sector illustrates why technology centres function as essential transition infrastructure. In 2021, the sector comprised around 12 000 firms and nearly 130 000 workers and was overwhelmingly SME-based, particularly in textiles manufacturing, apparel and leather-related products. As a result, SMEs carry most of the transition burden. [OECD estimates](#) suggest they account for over 80% of the sector's greenhouse gas emissions. This creates a multidimensional challenge, as companies must simultaneously reduce emissions while adapting products, production processes and data systems to meet new regulatory and market requirements. In this context, coordination capacity becomes critical.

CITEVE at a glance

[CITEVE](#) - the Technological Centre for the Textile and Clothing Industries of Portugal - is a private, non-profit organisation that supports the competitiveness, sustainability and technological maturity of the national textile and apparel ecosystem. Founded in 1989, it has evolved from a sectoral support structure into a fully integrated technology centre operating at the intersection of industry, research and public policy. Closely connected to SMEs and grounded in a strong industrial base, CITEVE acts as a trusted partner for companies navigating complex transitions related to sustainability and circularity, digitalisation, advanced materials and new market applications.

Comprehensive technological capabilities, from testing to industrialisation

CITEVE offers a broad portfolio of technological services for the textile sector. Its internationally accredited laboratories perform approximately 180 000 tests per year, covering physical, chemical and biological evaluations, functional performance, comfort, durability, safety, protection, environmental compliance and regulatory conformity. By combining performance validation with conformity assessment, CITEVE reduces technological and market risks associated with industrial adoption. At the research and innovation level, the centre provides development and prototyping infrastructures that support the transition from concept and pilot scale to industrial validation. These capabilities include transformation technologies for fibres and textile structures, functionalisation, composites, additive manufacturing, complex 3D components, clothing manufacturing, mechanical and biochemical recycling, robotics and automation, and integrated responsive fabrication.

Applied R&D and innovation aligned with industrial reality

Applied research and innovation are core pillars of CITEVE's activity. The centre leads and participates in national and European R&D projects addressing bioeconomy, sustainability, circular economy, ecodesign, digital product development, advanced and technical textiles and smart materials.

A defining characteristic of this work is its alignment with industrial constraints. Innovation activities are designed to be scalable, compliant and market-ready, ensuring that research outcomes translate into viable production processes and competitive products.

Strategic capabilities in technical and protective textiles

CITEVE is strengthening specialised competencies in technical and protective textiles, including dual-use applications related to defence and security. Through EU-funded projects, the centre supports the testing, prototyping and industrialisation of advanced solutions such as printed electronics integration, technical embroidery, seamless structures and advanced finishing technologies. These activities are developed in collaboration with industrial partners and relevant stakeholders and contribute to broader European priorities related to strategic autonomy and resilience.

Cross-sector innovation and diversification

Recognising that resilience and long-term growth depend on diversification, CITEVE promotes the transfer of textile technologies to adjacent sectors. A key element of this strategy is its long-standing collaboration with its spinoff CeNTI - Centre for Nanotechnology and Advanced Materials, which enables cross-sector R&D and industrialisation.

Joint projects have generated applications in areas such as construction, mobility and automotive, demonstrating how textile-based solutions can deliver high-performance outcomes in non-traditional markets.

Ecosystem orchestration and cluster leadership

CITEVE's role extends beyond individual company support. Since 2017, it has acted as the managing authority of the Portuguese Textile Cluster, transforming collaboration into a structured and permanent mechanism. Through this role, CITEVE facilitates cooperation across the value chain, aligns stakeholders around shared challenges and supports collective solutions in areas such as sustainability, traceability, digitalisation and skills development.

Its proximity to industrial reality is critical to its function as an ecosystem orchestrator, enabling the organisation of consortia and partnership-based initiatives that connect research, innovation and market deployment at national and international levels.

Conclusion

CITEVE represents a mature and robust example of a technology centre combining technical expertise, applied research capacity, industrial-scale validation and ecosystem coordination. As such, the CITEVE case illustrates how technology centres can act as ecosystem orchestrators, steering collaboration among firms, research actors and institutions, supporting the transfer of applied research into industrial practice, and ensuring that market and regulatory constraints are reflected upstream in research and policy design.

10. Optimising textile production: AI-Driven and process-oriented solution to reduce cutting scrap



The Transition Pathway for Textiles identifies digital transformation as a key enabler of circularity. In traditional textile and leather manufacturing, scraps generated during cutting typically account for 15%–25% of total material use. AI-powered digital solutions are emerging as critical tools to reduce these losses by optimising material utilisation. Companies such as Lectra provide AI-Driven and process-oriented solutions for integration into the production phase.

Introduction

Research conducted by CSIL on a sample of over 100 European upholstered furniture producers (which are major users of fabric and leather) indicates that one in two companies cite environmental sustainability as a top strategic priority. For many of them, material waste remains a persistent challenge. More innovative solutions that improve production yield while supporting sustainability targets are therefore increasingly important. By adopting AI technologies, businesses can streamline production and meet growing sustainability expectations from regulators and consumers.

How does AI-Driven and process-oriented solution work?

One example is nesting, which is the process of arranging pattern pieces on a fabric roll or leather hide. AI algorithms might optimise nesting by simulating vast numbers of placement combinations in seconds. These systems can account for fabric width, grain direction, and defects, producing layouts that often outperform manual approaches in terms of material yield.

A European company leading the adoption of AI in textile manufacturing

Lectra is a global player headquartered in France that develops Industry 4.0 solutions. It is active in the furniture, fashion and automotive sector. It employs approximately 3 000 people and reports turnover of EUR 527 million. Lectra leverages AI through cloud-based high-performance computing, automating processes for mass-scale manufacturing and enabling companies to reduce fabric consumption at high volumes by predicting precise material needs before the first cut is made. This optimisation reduces both waste and cost per cut part, directly addressing a top priority for today's manufacturers: aligning sustainability with profitability.

Investment and workforce training

While AI can materially improve resource and time efficiency, adoption is often constrained by three structural factors: high upfront investment, the availability of accurate, interoperable digital pattern data (which is challenging for non-standard materials), and the organisational effort required to reskill teams for automated, data-driven workflows. Crucially, upskilling is not a “replacement” of competence acquired at the company level: in most production contexts, digital adoption creates even higher value when tacit know-how (e.g. how to recognise defects, interpret material behaviour, and balance yield, quality, and aesthetics) is made legible and interoperable with digital workflows, so that it is retained and embedded rather than eroded. This is particularly important for non-uniform materials such as artisanal fabrics or natural leather, where variability, defects, and aesthetic still require expert judgement and competencies often rooted in long-established production clusters.

Conclusion

AI-Driven and process-oriented solutions offer a clear pathway to reducing raw material waste in Europe. Achieving impact at scale depends on balancing technology investment and skills development with long-term benefits in sustainability, productivity and competitiveness.

Conclusions

The practices presented in this report confirm that the transition towards a greener, more digital and resilient future of the textiles ecosystem is progressing from ambition to implementation. The ten initiatives published on the EU Textiles Ecosystem Platform between August 2025 and January 2026 demonstrate practical pathways to sustainability, circularity, digitalisation, resilience and social responsibility across multiple stages of the value chain, from fibre innovation and product design to material sourcing, production efficiency, service-based use models, and end-of-life management.

A key insight from this selection is the growing role of enabling systems that make circularity scalable. Extended Producer Responsibility mechanisms, digital platforms that organise and qualify waste streams, adopting of advanced technologies and developing technology centres that provide testing, validation and coordination are increasingly functioning as the “infrastructure” of transition. These structures reduce fragmentation, create incentives for eco-design and recycling, and lower the risk of adoption, especially for SMEs that face capacity and investment constraints.

At the same time, the practices highlight a stronger emphasis on upstream levers, design choices, material substitution and production optimisation, where environmental impacts can be prevented rather than managed after the fact. Circular design guidelines, bio-based material innovation, and AI-enabled cutting optimisation show how decisions made early in the lifecycle shape downstream repairability, recyclability, and resource efficiency.

The collection reinforces that the transition is multidimensional. Environmental performance improvements are closely linked with skills development, data availability, investment capacity, and cross-ecosystem collaboration (notably with waste management and agriculture through industrial symbiosis). Social responsibility also emerges as a concrete component of transition strategies, particularly where supply-chain transparency, fairer wages, and repair services are embedded in business models.

Overall, the best practices illustrate that progress towards the Transition Pathway objectives is driven by both ecosystem-level mechanisms that create the conditions for scale and replication, and by company-level actions that translate these conditions into operational change. Future editions of the Best Practices Report will continue to track the evolution of these practices, identify emerging initiatives, and highlight solutions that help close remaining gaps in infrastructure, data, technologies adoption, skills, and circular markets.