



Textiles Ecosystem Transition Pathway

Best Practices Report – Third Edition

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Written by EY Belgium and CSIL
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European Innovation Council and SMEs Executive Agency (EISMEA)
Unit I.02 - SMP/SME Pillar, Internal Market and Support to Standardisation
Email: EISMEA-SMP-SME-TEXTILE-ECOSYSTEM@ec.europa.eu

European Commission
B-1049 Brussels

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Executive Summary

This is the third Best Practices Report published in the context of the Textiles Ecosystem Transition Pathway. It showcases 10 examples of how organisations 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 February and June 2026.

The 10 best practices reflect a wide range of approaches, actors and stages of the textile value chain. Three best practices show **how textile and leather waste can be turned into new resources through industrial symbiosis**: [Pulvera](#) pulverises textile waste into new materials, [Plang and Kvadrat Really](#) transform it into furniture and interior products, and [SICIT and ILSA](#) recover leather residues to produce fertilisers and bio-stimulants. Two best practices focus on **extending the life of textile products** through repair and circular business models: [United Repair Centre](#) combines B2B garment repair with an inclusive workforce, while [MUD Jeans](#) uses recycled denim and offers a Lease-a-Jeans take-back programme. The best practice on [Humana People to People and Viitor Plus](#) in Romania addresses circularity from the consumers' perspective, raising consumer awareness through education and practical tools.

Reducing the **environmental impact of industrial-scale production** is another main theme of the featured best practices. As an example of collective initiative, the [European Outdoor Group](#) Carbon Reduction Project brings brands together to decarbonise their supply chains. [E. Miroglio](#) instead provides an example of a single company investing in more sustainable manufacturing at scale in Bulgaria. Textile [microfactories](#) tackle the environmental impact linked with overproduction, proposing a **digitally centred, on-demand production** model. Finally, [Sioen](#) links innovation with **European strategic autonomy** by supplying technical and protective textiles for defence and other critical sectors.

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, and investment. Geographically, the selected examples span several European countries – including Italy, the Netherlands, Belgium, Bulgaria, Romania, Germany and Denmark – and involve a broad range of stakeholders, from large industrial groups and SMEs to non-profit organisations, research institutes and industry associations.

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

Future editions of the Best Practices Report will identify new initiatives contributing to the objectives of the Textiles Ecosystem Transition Pathway.

Introduction

This third Best Practices Report is published in the context of the Textiles Ecosystem Transition Pathway. It provides an overview of 10 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](#) and [second](#) Best Practices Report, this edition expands the collection by analysing the 10 new best practices published on the platform between February and June 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 two reports and reflect the diversity of approaches, stakeholder types, and ecosystem segments that contribute to the Transition Pathway objectives.

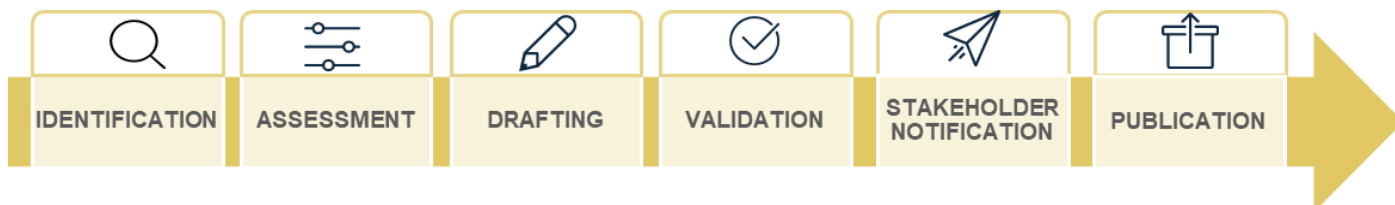
By highlighting these practices, the report aims to serve as both a reference and an inspiration for stakeholders across the textiles value chain, supporting knowledge-sharing and the replication of successful solutions.

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 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 10 new best practices published between February and June 2026 on the EU Textiles Ecosystem Platform and presented in this report.

Table 1 - Sources of the best practices published between February and June 2026

Best practice title	Source
Turning legacy know-how into a circular business in the textile sector and beyond: the case of Pulvera	Field research
Driving circularity and social inclusion: the case of the United Repair Centre	Consortium knowledge and suggestions ¹
Leveraging collective action to decarbonise supply chains: the Carbon Reduction Project of the European Outdoor Group	Consortium knowledge and suggestions ²

¹ Suggested by Blumine.

² Suggested by CSIL.

Industrial symbiosis: textile waste as a resource for furniture production	Consortium knowledge and suggestions ³
Awareness raising for circular textiles in Romania: the initiatives of Humana People to People and Viitor Plus	Desk research
How circularity in a business model can drive product innovation: the case of MUD Jeans	Consortium knowledge and suggestions ⁴
Scaling industrial textile production in Bulgaria, with attention to environmental impacts: the case of E. Miroglia	Consortium knowledge and suggestions ⁵
Recovery of tannery residues: industrial symbiosis models from the Italian leather value chain	Consortium knowledge and suggestions ⁶
Digitalisation as a lever for sustainability: the example of textile microfactories	Desk research
Protection through innovation: EU strategic autonomy and the case of Sioen	Pledges

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

³ Suggested by Blumine.

⁴ Suggested by Blumine.

⁵ Suggested by Blumine.

⁶ 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 before 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 **February and June 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 10 best practices identified and published on the EU Textiles Ecosystem Platform between February and June 2026. It includes links to the relevant platform entries, the main segment of the ecosystem covered by the best practice, the best practice topic, and the publication date.

Table 2 - Snapshot of the best practices published between February and June 2026

Best practice title	Textiles Ecosystem Platform Link	Main ecosystem segment	Topic	Date of publication
1. Turning legacy know-how into a circular business in the textile sector and beyond: the case of Pulvera	Pulvera	Fibres, yarns and fabrics	Industrial symbiosis	February 2026
2. Driving circularity and social inclusion: the case of the United Repair Centre	URC	Waste management, reuse and repair	Repair Business Model	February 2026
3. Leveraging collective action to decarbonise supply chains: the Carbon Reduction Project of the European Outdoor Group	EOG	Apparel and clothing accessories	Collective decarbonisation action	March 2026
4. Industrial symbiosis: textile waste as a resource for furniture production	Plang and Kvadrat	Fibres, yarns and fabrics	Industrial symbiosis & innovative materials	March 2026
5. Awareness raising for circular textiles in Romania: the initiatives of Humana People to People and Viitor Plus	Viitor Plus and Humana People to People	Waste management, reuse and repair	Consumers awareness raising	April 2026
6. How circularity in a business model can drive product innovation: the case of MUD Jeans	MUD Jeans	Apparel and clothing accessories	Recycled fibres and circularity	April 2026
7. Scaling industrial textile production in Bulgaria, with attention to	E. Miroglia	Fibres, yarns and fabrics	Sustainable sourcing and production	May 2026

environmental
impacts: the case of
E. Miroglio

8. Recovery of
tannery residues:
industrial symbiosis
models from the
Italian leather value
chain

[Recovery of
tannery residues](#)

Leather and fur

Industrial symbiosis
& bio-based
materials

May 2026

9. Digitalisation as a
lever for
sustainability: the
example of textile
microfactories

[Microfactories](#)

Apparel and clothing
accessories

Digitalised
production
processes and on-
demand production

June 2026

10. Protection
through innovation:
EU strategic
autonomy and the
case of Sioen

[Sioen](#)

Technical textiles

Strategic autonomy
& innovation

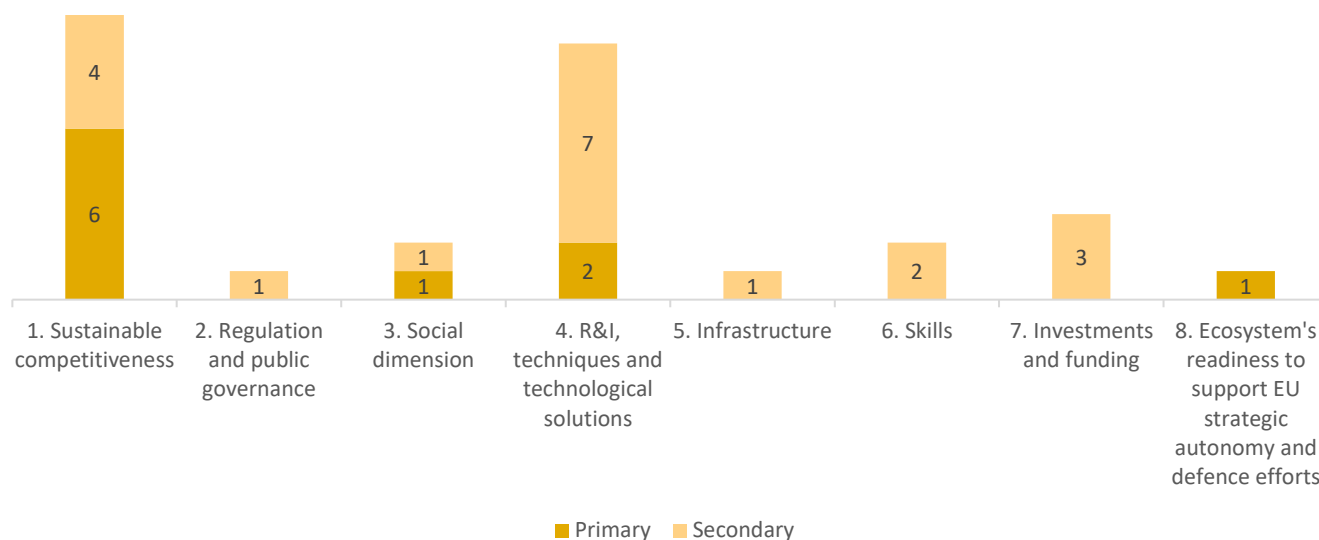
June 2026

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 primarily relate to sustainable competitiveness (building block 1) and R&I, techniques, and technological solutions (building block 4). Building block 1 covers best practices for introducing circular business models, efforts to decarbonise the supply chain, and measures to diminish the environmental impact of industrial textile production. Research, innovation, technological developments, and digitalisation are key to supporting these actions. The current selection also includes examples that relate to building blocks 3 and 8, aiming respectively to improve social inclusion and to strengthen the EU's strategic autonomy. Aspects linked to regulation, skills, infrastructures and investments are transversal themes across the best practices.

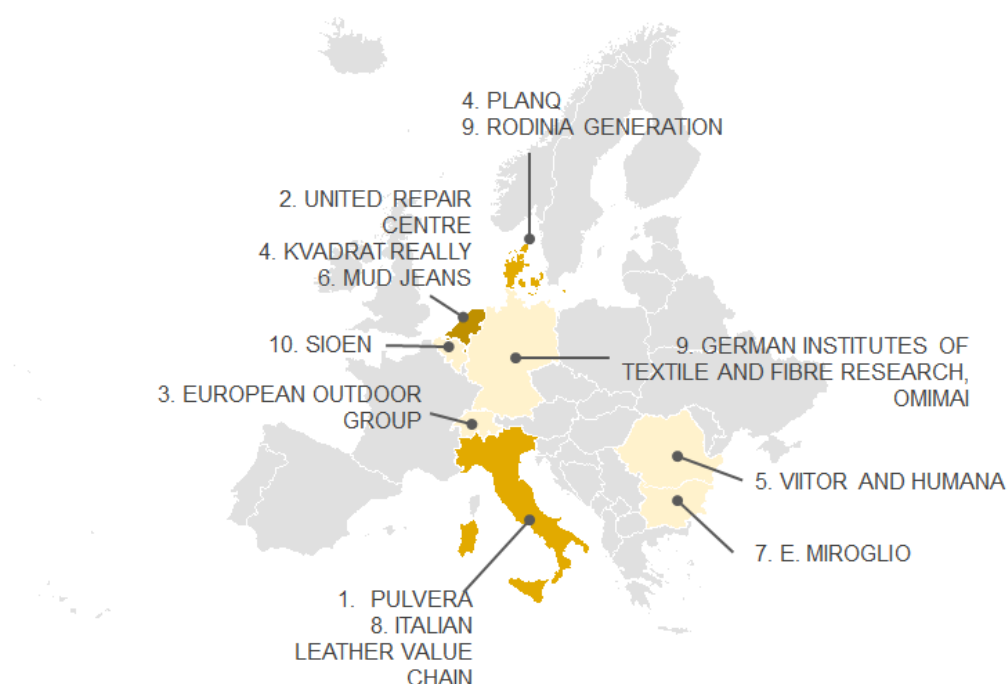
Figure 2 - Coverage of the Transition Pathway's building blocks by the best practices published between February and June 2026



Geographic coverage

Each published best practice can be linked to a specific country based on the location of the organisations mentioned as examples in the best practice. 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 local awareness-raising activities, as well as European-level initiatives and company-led practices operating through international supply chains.

Figure 3 - Geographic coverage of the best practices published between February and June 2026

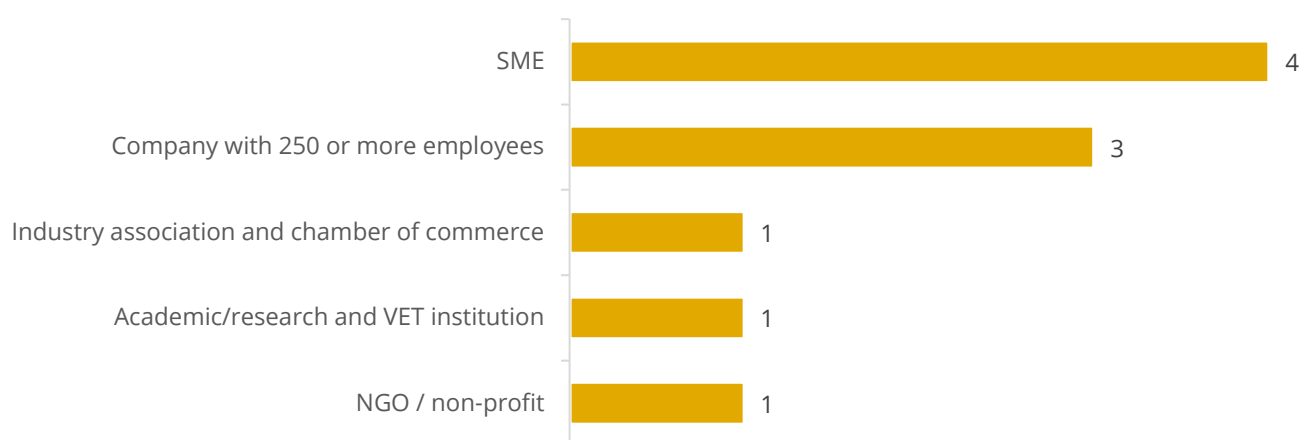


Types of stakeholders

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 10 best practices published during the period in scope, 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 February and June 2026



Some insights from the best practices

The 10 best practices published during this reporting period show complementary ways of moving the textiles ecosystem towards sustainability and circularity. They span the whole textile lifecycle, from raw materials and production to repair, reuse and end-of-life management. Some are led by single companies, while others are collective or sector-wide efforts.

A first group of best practices shows **how textile and leather waste can become feedstock for new products**, following the logic of industrial symbiosis. **Pulvera** pulverises textile waste of any fibre composition and blends it into new materials, deliberately moving beyond textile-to-textile recycling. **Planq and Kvadrat Really** turn textile waste into furniture and premium interior applications. In the **Italian leather cluster of Arzignano**, companies such as SICIT and ILSA recover collagen-rich tannery residues to produce fertilisers and bio-stimulants. Together, they demonstrate that waste streams can create value for other industrial value chains.

A second group focuses on **extending the life of products through repair and circular business models**. The **United Repair Centre** offers scalable B2B repair solutions to global brands and pairs this with a strong social mission, building an inclusive workforce of women and people with refugee backgrounds. **MUD Jeans** embeds circularity into its product through recycled denim and its Lease-a-Jeans take-back programme. Both embrace circularity not only for environmental purposes but also to leverage business opportunities. Consumers' choices and behaviours are key to circular business models. In Romania, **Humana People to People** and **Viitor Plus** focus on the consumer side of circularity, using education and practical tools to change buying and disposal habits.

A third group of best practices tackles the **environmental impact of large-scale, often outsourced, production**. The **European Outdoor Group's** Carbon Reduction Project is a pre-competitive collaboration among 26 brands that provides hands-on support to cut CO₂ emissions along the value chain through technical assistance and the preparation and implementation of plans with concrete actions to be implemented at producers' sites outside Europe. Within Europe and on the individual level, **E. Miroglio** is an example of how a major manufacturer in Bulgaria can invest in modern technologies and more sustainable processes while operating at an industrial scale. To address the environmental footprint linked with overproduction and long value chains, **textile microfactories**, pioneered by research institutes such as DITF Denkendorf and adopted by companies or start-ups like Rodinia Generation and OMIMAI, use digital, on-demand production to shift from a 'design–make–sell' to a 'design–sell–make' logic.

Finally, the example of **Sioen** links innovation to **resilience and strategic autonomy** by keeping key production stages in-house and within Europe, supplying technical and protective textiles to defence and other critical sectors while adding circular end-of-life design.

Best Practices in Detail

1. Turning legacy know-how into a circular business in the textile sector and beyond: the case of Pulvera



Pulvera is a newly established Italian company that leverages the textile pulverisation expertise developed within its family-run business, through a scalable process, to convert collected textile waste into textile fibre-based composites for a range of industries, including textiles, furniture, and beyond. Pulvera is an example of how innovative circular business models can open new business opportunities.

The company's mission and approach

[Pulvera](#) is an Italian company founded in 2024 by the third generation of Casati, a family with long-standing expertise in the textile sector. Pulvera's mission is to transform textile production scraps into new value-added materials. To achieve this, the company offers a comprehensive, full-lifecycle service that bridges the gap between strategic consulting and industrial production. This end-to-end approach begins with waste assessment and consulting for third parties, helping them identify the best strategies to valorise their textile waste, and culminates in the manufacturing of innovative recycled materials.

The manufacturing process

Pulvera collects textile waste of any fibre composition and converts it through the pulverisation process. The resulting output is then blended with other materials to create "textile fibre-based" composites. At the heart of Pulvera's operations is a specialised transformation process that leverages the proprietary powdering technology developed by [Casati Flock & Fibers](#).

Moving beyond conventional textile-to-textile recycling systems

Pulvera constantly experiments with alternative applications for its fibres, going beyond the traditional textile-to-textile recycling model. By adopting an "industrial symbiosis" business model, Pulvera enables a circular flow where the waste of the textile sector becomes a primary resource for other industries, such as furniture and automotive manufacturing. This approach creates a dual benefit: it reduces the generation of textile waste while simultaneously decreasing the industry's reliance on virgin materials.

Conclusion

Pulvera testifies that new generations can play a key role in rethinking traditional manufacturing processes towards new circular models. It also shows that moving beyond the conventional view of textile scraps as merely an end-of-life problem, and instead treating them as a valuable input, can unlock new markets and create business opportunities.

2. Driving circularity and social inclusion: the case of the United Repair Centre



United Repair Centre (URC) is a Dutch B2B clothing repair company providing scalable, high-quality repair solutions to global apparel brands seeking to extend product lifespans and advance circularity. The company has built a business model generating a positive environmental impact through large-scale garment repair while creating inclusive employment opportunities for people facing barriers to the labour market.

A business model with a twofold objective

[United Repair Centre](#) is a B2B clothing repair service offering high-quality, scalable repair solutions to global brands, helping them extend garment lifespans. The company, founded in 2021 and headquartered in the Netherlands, currently operates in Amsterdam and London. The company became B Corp in 2024.

Since its start, the business model has not only been centred on an environmentally virtuous circle, but also on a social dimension: creating job opportunities for people facing barriers to entering the labour market.

An inclusive and diverse workforce

According to its last impact [report](#), as of July 2025, United Repair Centre can count on a team of 52 workers, with 18 new hires in 2024.

The team composition reflects the company's commitment to building a more inclusive labour market: 63% of tailors are women, 75% are newcomers with refugee backgrounds, and 18 nationalities are represented in the workforce. Furthermore, to reinforce its commitment, the company employs individuals with disabilities, including occupational disabilities, and individuals with a history of long-term unemployment. By embedding inclusion into its recruitment and workforce structure, the company enables employees to develop professional skills while strengthening their language proficiency, thereby facilitating their integration into the labour market. In 2024, the company strengthened this pathway by launching the United Repair Academy with ROC van Amsterdam (Fashion Studies). This work-learning programme trains aspiring garment repairers and supports their transition into paid roles.

Scaling environmental benefits through repair

As the workforce and skills base expanded, the company scaled up its operational capacity and environmental impact. In 2024, it repaired an estimated 29,545 garments, corresponding to average CO₂ savings of 159,247 kg. By July 2025, the cumulative number of repaired items had further reached 72,000.

Partnerships with brands and collaborative initiatives

According to its latest impact report, as of July 2025, United Repair Centre has onboarded 27 brand partners, including 14 new partners in 2024. Starting with Patagonia, the company has since added several industry leaders, including: The North Face, Arc'teryx, Jack Wolfskin, Rapha, Lululemon, Decathlon, and Levi's. In some cases, these collaborations also include on-site repair stations (e.g. the one implemented in 2024 at North Face in Switzerland), repair pop-ups activated in high-traffic settings to deliver live garment fixes and engage customers around circularity (e.g. with Patagonia at the Down The Rabbit Hole festival, 2024) or hands-on workshop with store managers, offering them direct experience of the repair process and demonstrating its tangible impact.

The company also launched the Renew service (assessment and grading, washing, reproofing, and repair), which converts unsold or returned items into resale-ready products, helping brands boost their circularity profile and engage customers.

Conclusion

The company's results - growth in brand collaborations, workforce expansion, and the rising number of garments repaired - demonstrate that clothing repair can scale in a way that is both commercially viable and socially responsible. By combining measurable environmental benefits with inclusive employment and skills development, United Repair Centre is building a model that delivers impact at scale.

Additionally, United Repair Centre tackles a systemic challenge: green transition cannot be delivered by brands alone. By providing scalable repair infrastructure and expertise that brands might lack in-house, it removes operational barriers and accelerates circularity implementation.

3. Leveraging collective action to decarbonise supply chains: the Carbon Reduction Project of the European Outdoor Group



A growing share of the environmental impact of the outdoor sportswear and equipment industry lies upstream, in global supply chains that individual companies can influence only to a limited extent. The Carbon Reduction Project of the European Outdoor Group demonstrates how collaborative action among brands can help turn shared challenges into coordinated solutions.

The rationale for joint action on decarbonisation

The EU outdoor sportswear and equipment industry is characterised by a high degree of outsourcing outside Europe, with a significant share of production taking place in global supply chains. Most of the sector's greenhouse gas emissions are concentrated in upstream stages, particularly in energy-intensive processes such as: textile production, dyeing, printing, and finishing, due to their reliance on coal and gas. Over 90% of the GHG emissions reported in outdoor brands' corporate carbon footprints are Scope 3 emissions, of which more than 70% relate to the purchase of goods and services.⁷

These operations are generally carried out outside Europe. Leverage of EU companies over suppliers may be constrained, particularly when order volumes are fragmented or when suppliers serve multiple international customers. This creates a strong rationale for joint action.

The European Outdoor Group and its initiative

The [European Outdoor Group](#) (EOG) is a European industry association that brings together leading international brands and organisations active in the outdoor sportswear and equipment segment. It represents a broad membership across the value chain, including over one hundred organisations—brands, retailers, and suppliers—many of which produce or use textiles and advanced technical textiles in their products.

Within the framework of its Climate Action Programme, EOG launched the Carbon Reduction Project in 2021, a pre-competitive collaborative initiative aimed at reducing greenhouse gas emissions and increasing the use of renewable energy within the outdoor industry supply chain.

More specifically, the initiative is structured into five stages: mapping the supply chain networks of participating organisations; prioritising those requiring brand support; conducting an evaluation phase to identify the most emission-intensive processes (e.g., boilers, dyeing machines) and facilities; implementing improvements in shared supplier factories co-funded by participating brands to reduce emissions; and, finally, tracking and monitoring facility progress against targets.

The results

Since its launch, the project has involved 26 European brands across three participation rounds, held in 2021, 2022, and 2025. Participating brands include: Deuter, Fenix, Mammot, Gore, among others. Most of the facilities linked to participating brands are located in China (57%), followed by Taiwan (18%) and Vietnam (10%).

The initiative has engaged 21 facilities, which received hands-on technical support to measure emissions, develop reduction plans, and implement decarbonisation actions. In total, 275 mitigation actions were

⁷ Source: Carbon Reduction Project Case Study, European Outdoor Group, November 2025.

agreed for implementation by participating facilities, including optimisation of existing processes, investment in new technologies, and switching electricity supply to renewable sources.

For 10 facilities under long-term monitoring (who have been participating since the beginning), emissions decreased by 48.2 million kg of CO₂ emissions between 2021 and 2024, corresponding to a 66% reduction. It should be noted that this reduction reflects both mitigation actions initiated through the project and measures that were already underway prior to its launch.⁸

At the same time, the initiative is addressing more systemic barriers to decarbonisation. In Taiwan, where textile mills and SMEs face difficulties in accessing green electricity due to high costs, limited supply, and demanding contract conditions, the EOG is supporting the assessment of feasible off-site renewable electricity options for each supplier, as well as the development of practical business cases for collective procurement.

Conclusion

This initiative is characterised by several distinctive features that contribute to its effectiveness in achieving the environmental objectives of the EU. It is based on a pre-competitive, supply chain-level collaboration model, which is essential for European companies in the textile and apparel sector. Additionally, it provides hands-on technical support to supplier facilities, going beyond traditional target-setting approaches, and combines immediate mitigation actions with more systemic interventions, such as improving access to renewable energy for SMEs in key sourcing regions.

The continued participation of European brands over several years, together with the growing number of companies involved along the supply chain, also points to strong and sustained industry engagement. By leveraging shared suppliers and collective action, such initiatives can generate sector-wide impact, rather than isolated company-level results.

⁸ Source: Carbon Reduction Project Case Study, European Outdoor Group, November 2025.

4. Industrial symbiosis: textile waste as a resource for furniture production



The intersection between the textiles and furniture sectors offers concrete opportunities for industrial symbiosis. By redirecting textile waste streams into new production cycles, industrial symbiosis supports circularity objectives, reduces environmental impact, and fosters cross-sectoral innovation. The companies Planq and Kvadrat, which are investing in this direction, demonstrate the viability of this approach.

Design and sustainability as drivers of industrial symbiosis

Waste generation throughout the value chain remains a major challenge for the textile sector. Overcoming this challenge requires the development of circular solutions, both within the textile ecosystem and in collaboration with other sectors. In this context, industrial symbiosis offers a promising and increasingly viable approach. Among others, the furniture sector is an appealing destination for textile by-products and waste. The EU furniture industry is, in fact, strongly design-driven and innovation-oriented, which makes it particularly receptive to the adoption of new materials and solutions, including the integration of recycled textile-based materials to respond to the increasing demand for sustainable products and furniture finishes. Planq and Kvadrat exemplify companies developing innovative solutions to repurpose textile waste into durable, multi-functional materials for the furniture industry.

Planq scaling recycled textile-based materials in B2B and contract furniture markets

[Planq](#) is a Netherlands-based SME founded in 2017. It is a design-driven furniture company that develops and commercialises tables, chairs, panels, and interior elements, as well as semi-finished materials that can be integrated into third-party production processes. These solutions are targeted mainly at B2B markets, including office furniture, interior design, retail, hospitality, and architectural applications. The company has developed a process to shred textile waste, such as old denim, army clothing, suits, etc., as well as biobased fibres, such as flax, hemp, and jute coffee bags, into fibres, which are then carded into a felt material. The felt material is then pressed with a biobased binder to produce [Rezign®](#). Originally developed as a cladding panel, the material found its true potential in interior applications, where it is used as a structural and aesthetic component in tabletops, seating, cubic cabinets, and other interior elements produced by the company. The material, which consists of a relevant share (approximately 50%) of textile waste, can be used to substitute plastic-based options commonly used in furniture finishing. By transforming heterogeneous textile waste streams into a consistent and manufacturable material, the company addresses a key barrier to circular material adoption. Additionally, with a full circular approach, the company's products are specifically designed to be reused, repaired, and remanufactured (e.g., with the use of reversible glue to enable disassembly).

Kvadrat Really integrating textile waste in premium applications

[Kvadrat Really](#) is partly owned by Kvadrat, the Danish textile company that develops and supplies high-performance textiles and high-end interior solutions for both commercial and residential environments. Kvadrat Really focuses on the production of solid surfaces, tabletops, boards, and acoustic panels made entirely from upcycled end-of-life textiles. Its operations process approximately 550 tonnes of textile waste annually, converting materials that are unsuitable for fibre-to-fibre recycling into high-quality, durable

products. For example, the company's Textile Tabletop™, which is produced using 70% textile waste, is estimated to achieve a 30% reduction in CO₂ equivalent emissions compared to a conventional tabletop, considering the entire lifecycle from material extraction to a finished tabletop ready for mounting. Although production volumes remain relatively limited compared to mass-market materials, this activity represents another example of potentially scalable industrial symbiosis with a positive environmental impact, without compromising performance or aesthetics in architecture and large-scale interior applications. Moreover, the sustainability profile of Kvadrat Really is further strengthened by its manufacturing process, which uses no water in fibre processing, generates no residual waste, and avoids dyes as well as toxic chemicals. Consequently, this production model reinforces the company's circular proposition by combining waste valorisation with a cleaner and more resource-efficient manufacturing approach.

Conclusion

The examples of Planq and Kvadrat Really illustrate how industrial symbiosis can contribute to the transition of the textiles ecosystem by enabling the reuse of materials that would otherwise be discarded, as well as to strengthening resilience by diversifying material inputs and reducing dependence on virgin resources. These initiatives demonstrate replicability within the broader furniture and interior design sectors, particularly in B2B and contract markets where demand for sustainable solutions is growing. More broadly, these cases underline the importance of creativity, design, and innovation as enablers of circularity, and they highlight a viable pathway for scaling industrial symbiosis through value-driven markets rather than volume alone.

5. Awareness raising for circular textiles in Romania: the initiatives of Humana People to People and Viitor Plus



Raising consumer awareness is a key enabler for advancing circularity in the textile sector, particularly in markets where collection and recycling systems are still underdeveloped. In Romania, where textile waste generation is increasing, organisations such as Humana People to People and Viitor Plus play an important role in promoting more sustainable consumption patterns through educational programmes, awareness campaigns, and practical tools.

Romania's textile consumption and waste landscape

Romanian clothing consumption has grown in recent years, reaching around EUR 5-7 billion, making it a mid-sized market in Eastern Europe. Romanians' purchasing power remains below the EU27 average, but the share of the budget they allocate to clothing purchases is higher (6% vs 4% respectively). This market growth has led to increased textile post-consumer waste generation, which now amounts to approximately 160,000 tonnes per year, according to [ARTEX](#), the Romanian Association for Textile Reuse and Recycling. Separate collection of used textiles remains among the lowest in Europe: only 0.5–0.7 kg per capita, compared to 6–12 kg in Western European countries and more than 95% of textiles end up incinerated or landfilled (source: Ziarul Financiar, 17 December 2025). The ecosystem for collecting, sorting, and recycling is growing, but its capacity remains limited. This is why awareness and education about reuse and extending clothing lifetimes are gaining importance in Romania.

Educational programmes promoted by Humana People to People

[Humana People to People Romania](#) operates 40 second-hand clothing stores and employs around 300 people nationwide. In 2025, it launched [Humana Hub](#), a platform for education and dialogue on sustainable fashion. The platform connects consumers, designers, and experts and creates a space to discuss practical solutions to reduce textile waste. Activities take place both in physical locations (Humana People to People stores) and online. So far, the events and workshops organised have attracted over 100 participants to topics such as: smart clothing choices, closet organisation, garment life extension, and upcycling.

In parallel, Humana People to People developed its first educational programme on sustainable fashion, “Iubim Sustenabilitatea în Modă / We Love Sustainable Fashion”, in partnership with [Fundatia Noi Orizonturi](#). The programme, which started two years ago, focuses on raising awareness among young people about the environmental impact of fashion and promoting responsible consumption. In the first year, Humana People to People developed an educational toolkit (freely available to teachers) and implemented the programme in three schools, reaching 65 students. Of these, 31 became peer trainers and reached over 200 additional classmates. In the second year, the programme expanded to eight local communities, trained 19 youth ambassadors and engaged around 200 students in workshops. The project received a national award at the Romanian Sustainability and CSR Awards.

Awareness raising campaign and practical tools to engage citizens promoted by Viitor Plus

[Asociația Viitor Plus](#) is a Romanian non-profit organisation founded 20 years ago that today employs 75 workers, half of whom in its Atelierul de Pânză, a social enterprise focused on the production of eco-friendly textile products through upcycling activities and the employment of disadvantaged and vulnerable workers. The company uses pre-consumer waste from various sources, including for example IKEA's fabric leftovers.

Viitor Plus also contributes to circularity and consumer engagement through both practical tools and educational initiatives. Its [Harta Reciclării](#) (Recycling Map), helps citizens identify collection points and reuse solutions for their clothes, thus making circular practices easier to access. The platform was initially developed in 2019 and upgraded in late 2024. Now it maps more than 20,000 collection points of which 755 for textile and shoes, over 340 points dedicated to repairs and second-hand stores and 150 points for donation. At the end of 2025, Viitor Plus also launched a dedicated campaign to highlight the scale of textile waste and encourage reuse, repair and responsible disposal: “[Muntele de Haine](#)” (Mountain of Clothes). So far, the campaign has received around 800,000 views on social media channels.

Conclusion

Romania’s textile sector illustrates the structural challenges of transitioning towards circularity. Low collection and sorting rates, together with limited recycling capacity, require relevant investment in logistics and infrastructure. However, infrastructure alone might not be sufficient as circularity also depends on consumer behaviour. Awareness and education initiatives, therefore, play an important role in supporting the transition, especially as younger generations show increasing openness to second-hand consumption and alternative ownership models. In this context, the work of Humana People to People and Viitor Plus is a remarkable example of impactful activities that provide consumers with the instruments to translate policy objectives into effective practices.

6. How circularity in a business model can drive product innovation: the case of MUD Jeans



The denim industry is highly resource-intensive, particularly in terms of water use, making circularity an increasingly relevant strategy. The case of MUD Jeans shows that combining product lifetime extension with recycled materials in product design can partially reduce environmental impact.

The resource intensity of denim production

Literature and life cycle assessment studies indicate that producing a single pair of jeans can require up to 3,700 litres of water. Denim, used in jeans production, is in fact made through a particularly resource-intensive and environmentally harmful process, especially compared with standard cotton fabric. Its dyeing and finishing stages generate relatively high CO₂-emissions. As a result, attention to the circularity of this product is increasing.

Who is MUD Jeans

[MUD Jeans](#) is a small enterprise based in Weesp, Netherlands. Established in 2012, it has held certifications for its high standards of social and environmental performance, accountability, and transparency since 2015 (B Corp certification). The company's core business is the sale of jeans, with around 40,000 pairs sold per year through a network of more than 250 dealers across the EU. Jeans are manufactured in Tunisia at the facilities of Yousstex International, a strategic production partner of MUD Jeans.

The roots in innovation for circularity

Since its inception, MUD Jeans has sought a more environmentally friendly way to produce and sell jeans. As early as 2015, the company started working with fabrics containing up to 40% post-consumer recycled cotton. Since then, it has actively experimented with innovative technical solutions to progressively increase the use of recycled materials, complemented by organic cotton. According to the latest company sustainability report, 90% of its jeans now contain post-consumer recycled cotton, 6% contain pre-consumer recycled cotton. The company's ambition is to continually increase the proportion of recycled fibres in its products, while pursuing the long-term goal of achieving 100% recycled fibre composition. To supplement its recycling materials, the company also sources pre-loved denim from other brands, provided it contains no more than 4% synthetic fibres.

MUD Jeans has significantly reduced water use in denim production by implementing recycled water and water-saving production techniques and by conducting continuous research and innovation to produce and integrate recycled cotton in innovative ways. According to the company, producing one pair of MUD Jeans requires 460 litres of water, which is considerably less than the industry average.

MUD Jeans is also known for pioneering the **Lease-a-Jeans model**, launched in 2013. Customers can lease a pair of jeans for 12 months at a monthly fee, with free repair service available if needed. At the end of that period, they can either keep the jeans or send them back to the company, which then assesses them and either resells them as vintage items, or recycles them into fibres for the production of new denim.

Beyond product-level circularity

Beyond product-level circularity, the MUD Jeans's approach extends to interventions along the value chain, particularly through transparency, traceability, and social standards in production, as well as through a communication strategy based on "radical transparency" and knowledge sharing. This approach aims to influence industry practices and encourage the broader adoption of similar models.

Conclusion

Denim is associated with a highly resource-intensive production process. Still, its characteristics make it particularly suitable for circular business models such as reuse and repair, and it is also a promising category for the development of closed-loop textile recycling systems. Denim is, in fact, a durable material designed to withstand repeated use over time. Extending the life of jeans through repair and reuse to maximise their embedded value is therefore relatively more feasible than in other apparel categories. Additionally, denim garments are relatively standardised in terms of fabric construction, as they are made with a high share of cotton and relatively limited fibre blending. This makes sorting, processing, and fibre-to-fibre recycling easier and more efficient. MUD Jeans addresses both dimensions and provides a concrete example of how this potential can be translated into a viable circular business model.

7. Scaling industrial textile production in Bulgaria, with attention to environmental impacts: the case of E. Miroglio



Bulgaria is a significant textile and clothing manufacturing hub in Europe, particularly for nearshoring and flexible production serving Western European markets. E. Miroglio, a company established through Italian investment and active in spinning, weaving, and clothing manufacturing, illustrates how industrial-scale textile production can be combined with active environmental management.

Bulgaria, a flexible textile manufacturing hub in Europe

Within the EU textile and clothing sector, Bulgaria is not one of the largest markets, but it plays a strategically relevant role as a competitive nearshoring and flexible manufacturing hub, primarily supporting apparel production for Western European brands. The sector counts approximately 4,000 companies active in textile and clothing production, including private-label manufacturers⁹. Total Bulgarian textile and apparel production ranks the country among the top 10 in terms of turnover, just behind Poland and Romania in Eastern Europe.

E. Miroglio, a long history of investment in Bulgaria

In the mid-1990s, the Italian textile group Miroglio made its first investment in Bulgaria, attracted by competitive manufacturing costs, proximity to European markets, and access to skilled labour and technical expertise. The investment began with the acquisition of the Sliven wool mill, a historic site of the Bulgarian wool industry formerly known as Slitex. This allowed the company to develop production of worsted and woollen fabrics for men's and women's apparel, as well as yarns for knitwear. In 2006, the company was fully acquired by Edoardo Miroglio and became [E. Miroglio EAD](#). Headquartered in Sliven, the company has vertically integrated operations, with manufacturing facilities in Sliven and Yambol, and a retail presence through the DiKa clothing brand in Sliven, Burgas, Varna, Sofia, Plovdiv and Veliko Tarnovo¹⁰. The company employed 2,269 workers and generated EUR 130 million in turnover in 2024, growing by 20% in the last five years.¹¹ Its activities include carded and worsted spinning of wool and cotton, weaving, dyeing and finishing, knitting, and the design and manufacture of clothing models.

Embedding sustainability in industrial textile manufacturing

The company works with major global fashion brands and has invested in modern textile technologies, for both woven and knitted textiles, and sustainable manufacturing processes to improve efficiency and reduce environmental impacts. As set out in its [ESG report](#), the company is committed to sustainable development and environmental protection, integrating environmental management, certified materials, traceability, and resource-efficiency measures throughout its production chain. It operates under a range of internationally

⁹ Eurostat. *Enterprise statistics by size class and NACE Rev. 2 activity (from 2021 onwards)*. Structural Business Statistics, dataset (NACE 13: 725 companies, NACE 14: 3,204 companies).

¹⁰ The company also has workshops in Italy.

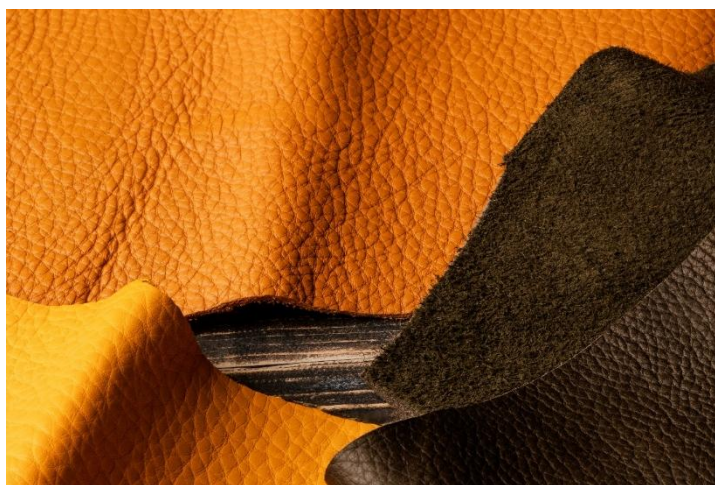
¹¹ Source: Orbis database, Bureau van Dijk / Moody's Analytics.

recognised frameworks and certifications, including SA8000, ISO 14001, ISO 45001, ISO 9001, FSC, OEKO-TEX® STeP, Standard 100, Higg Index, ZDHC, GOTS, GRS, OCS, RWS and has also invested in lifecycle assessment (LCA), wastewater monitoring, and eco-certified yarns. As part of its efforts to reduce its carbon footprint, the company has established an annual data collection and reporting process aimed at tracking resource use over time and driving improvements in production efficiency and environmental performance.

Conclusion

E. Miroglia's efforts to reduce environmental impacts while operating at an industrial scale make it a useful example of good practice in the transition towards a more circular and transparent textile industry. Given its scale and prominence in Bulgaria, the company is of particular significance at the national level, while its role as a supplier to the European textile value chain makes it significant also for the broader regional ecosystem.

8. Recovery of tannery residues: industrial symbiosis models from the Italian leather value chain



The recovery of tannery residues in Italy is a circular-economy practice that demonstrates that residues generated during leather processing can be transformed into valuable inputs for other sectors through industrial symbiosis. SICIT Group S.p.A. and ILSA S.p.A., companies active in converting tanning by-products into bio-based collagen-derived products, fertilisers, biostimulants, and other materials, have developed long-standing collaborations with Italian tanneries, generating both economic and environmental benefits.

The challenge of tannery residues

Leather production is intrinsically linked to circularity at the raw material stage, as raw hides and skins used by the tanning industry mainly come from the food chains of cattle, sheep, goats and pigs. At the same time, tanning is a complex industrial process that generates significant residual streams: it is estimated that less than 30% by weight of raw hides is converted into finished leather. The residues include a variety of materials: Animal By-Products (ABPs), such as hair, fleshings, and other solid outputs from the early stages of processing, and tanned waste, such as shavings and trimmings from crust or finished leather. The proper management and valorisation of these residual streams are not marginal technical matters but structural sustainability challenges for the leather value chain. Quantitatively, untreated leather and collagen by-products are the biggest problem in the leather industry.

The recovery paths of tannery residues in Italy

According to [UNIC](#), the Italian Tanners' Association, for every square metre of finished leather produced in Italy, around 2 kilos of Animal By-Products residues and over 1 kilo of other solid waste are generated. This data indicates the scale of the issue, considering that Italy produces approximately 100 million square metres of finished leather per year, and that the Italian tanning industry accounts for 67% of total EU leather production.

The Italian tanning industry has long enabled the transformation of production residues from waste into raw materials for other industrial value chains, creating a diversified system of valorisation in which different streams are directed to specialised routes based on their composition and regulatory status. Reference sectors include: agriculture, cosmetics, pharmaceuticals, and construction. These supply chains have enabled significant reductions, or even elimination, of some of the most significant types of tanning waste.

Circular models to produce fertilisers and bio-stimulants

One of the most established recovery routes for collagen-rich tannery residues is the production of fertilisers and bio-stimulants, transforming protein-rich animal by-products and leather processing residues into hydrolysed proteins.

[SICIT Group S.p.A.](#), headquartered in the Arzignano leather cluster, is a prominent example in this field. Back in the 1960s, following public health concerns about the spread of tanning residues on agricultural land, the company became a specialised actor and a global leader in their treatment, transforming leather tanning residues into protein hydrolysates used mainly as biostimulants for agriculture and as additives for the construction industry. Today, the company operates as a large, specialised circular-economy company, with

EUR 125 million in revenue (doubling from 2020), two active production plants in Italy and one in Mexico, plus another one in Chile dedicated to the production of seaweed extracts, sales in over 80 countries, all of which confirm its growth trajectory. The scale of its material recovery is significant: the company specifically reported removing around 155,000 tonnes of animal products from tannery residues streams and incorporating them into its production process in 2024 (+6% on 2022). This is particularly relevant because the company's services provide tanneries with an alternative to landfill, destruction, or other environmentally damaging or economically disadvantageous treatment options. The collection services are carried out within very short timeframes, as some of these materials are subject to rapid deterioration. In this context, SICIT can leverage its proximity to the tanneries, located within the same industrial cluster.

[ILSA S.p.A.](#), operative in the Arzignano cluster and founded in 1956, is another example. ILSA's relevance to tannery residue recovery stems from its long-standing and specialised expertise in transforming, through hydrolysis processes, collagen-rich materials into agricultural bio-stimulants and fertilisers. The company is one of the few Italian companies with its own accredited in-house laboratory, employs 73 workers and generates a turnover of around EUR 28 million (data for 2024). The company has two production facilities, one in Arzignano and the other in Molfetta, in the province of Bari, and thanks to a network of partners and retailers, its products are present in more than 50 countries worldwide.

Conclusion

The recovery of tannery residues reduces disposal pressures for tanneries, creates value from collagen-rich biomass, and supports the development of bio-based products. In this context, tannery residue recovery is relevant not only for waste management but also for resource efficiency and the competitiveness of the leather ecosystem. The Italian long-standing experience shows that these systems require specialised technologies, stable relationships between tanneries and recovery operators, regulatory compliance, quality control, and sufficient industrial scale.

9. Digitalisation as a lever for sustainability: the example of textile microfactories



Overproduction and long, fragmented supply chains are key challenges for the textile and clothing industry, as they carry a heavy environmental footprint. The microfactory concept offers an alternative logic by bringing design and production together in a compact, digitally networked cell, enabling on-demand, local production and reduced resource use. This approach is also giving rise to new business models that embed digital technologies at their core, reshaping the way fashion products are designed, produced and delivered. The Digital Textile Micro Factory developed by the DITF and the commercial applications pursued by Rodinia Generation and OMIMAI provide concrete examples of how the microfactory model is being implemented through digitally enabled, local and on-demand production.

From overproduction to microfactories

Garments are often produced in large volumes before actual demand is known, leaving a significant share unsold, discounted, returned or discarded. This fuels systemic overproduction across the textile and clothing industry. At the same time, long global supply chains generate extended lead times and heavy transport emissions, while demand is shifting faster and customers increasingly expect personalised products. The search for processes that can make products more quickly, in more customised formats, and with a lower footprint is precisely what led to the development of the microfactory concept.

The Digital Textile Micro Factory developed by the German Institutes of Textile and Fibre Research

The [German Institutes of Textile and Fibre Research](#) in Denkendorf began studying microfactory solutions more than a decade ago, initially focusing on flexible production systems that can respond quickly to changing demand. This research evolved into the Digital Textile Micro Factory (DTMF), a demonstrator of sustainable, digitally networked textile production, from design to finished product. By linking 3D simulation, digital twins and physical production, the DTMF connects virtual design directly with garment manufacturing. Presented at several trade fairs, including DRUPA 2024, it shows how microfactory setups can save resources, reduce overproduction and returns, improve quality, enable complex product personalisation and support new business models.

From concept to business

Around this concept, a number of start-ups and companies have begun building their business models, leveraging different microfactory setups to focus on onshore, on-demand garment production.

One example is the Danish company [Rodinia Generation](#), founded in 2017 and headquartered in Copenhagen, where it runs its production unit and R&D laboratory. Rather than a fashion brand, Rodinia describes itself as a technology company at the intersection of software, hardware and apparel manufacturing. Its patented O-FACTORY® system automates the entire clothing production process. A single O-FACTORY® setup occupies around 200 square metres, can produce thousands of unique garments per day, and can deliver in as little as 48 hours from order, while covering most clothing categories. By making only what actually sells and producing close to the consumer, Rodinia reports meaningful reductions in CO₂ and water per garment. It frames its mission as ending overproduction through a global network of automated, on-demand, low-impact factories.

A second example is the German start-up [OMIMAI](#), established in 2025 and based in Amt Wachsenburg (Thuringia). The core of OMIMAI is the freedom to configure made-to-measure garments of various types, produced in Germany from high-quality, sustainable fabrics, at accessible prices. The company offers a self-tailored decentralised on-demand apparel manufacturing system, that leads clients to the design and hyper-local production of custom-made apparel, enabling economically viable manufacturing from lot size one onward. This keeps production close and personal to the customer, shortens transport routes and avoids waste, while giving customers a genuinely tailored product rather than off-the-rack standard sizing. The approach combines localised and networked production, digital design workflows, and industrial manufacturing standards to support both B2C and B2B applications. Production processes are developed with consideration for sustainability, circularity, and technological integration.

Digitalisation in support of sustainability

These setups and business models directly address the main sustainability pain points in garment production: long supply chains, overproduction, and inefficient processes. The shift to regional, on-demand and made-to-measure manufacturing is where digitalisation pays off most clearly, and several studies point to substantial environmental gains. The ECO-Shoring project, funded by the German Federal Environmental Foundation (DBU) and carried out by Assyst and the DITE, is a useful reference. Combining nearshoring, made-to-measure and on-demand production in regional networks — supported by digital avatars, virtual fitting and fully digital production processes — the consortium estimates that the carbon footprint of clothing could be cut by up to 98% compared with fast fashion, primarily through green electricity, reduced overproduction and longer garment use.

From "design, make, sell" to "design, sell, make"

The deeper change these models introduce is one of sequence. The conventional industry works on a design–make–sell logic, producing first and hoping to sell later. The microfactory model inverts it into a design–sell–make model: the garment is designed and sold, and is made only then. Whereas this model seems not suited to bulk volumes and the mass market, it adds real value in customisation and premium production. By integrating digital design directly with the digital production process, it becomes possible to produce in short lead times and in virtually unlimited formats, turning personalisation into a viable, scalable proposition rather than a costly exception.

The model is continuously evolving. The most compelling direction is the move towards a network of microfactories: distributed, locally rooted production cells that together can serve the market while keeping manufacturing close to the customer. Recent initiatives on on-demand production point in the same direction, including the [first projects](#) financed by the EU “Textiles of the Future” Partnership, focused on digitally enabled local-for-local textile and apparel production.

Conclusion

Microfactory setups and business models are increasingly appealing. Along with environmental benefits, these business models create growth opportunities by leveraging customisation, speed, and proximity. As digital design and digital production continue to converge, microfactories offer a path towards a textile industry that produces less waste, fewer emissions and more of what people actually want.

10. Protection through innovation: EU strategic autonomy and the case of Sioen



Open strategic autonomy depends on Europe's capacity to produce the materials essential to sectors such as defence and public safety, as well as maritime, energy and industry. Sioen Industries, a Belgian technical textiles group, illustrates how a vertically integrated, innovation-driven, and predominantly European production base can secure the supply of high-performance protective and technical textiles.

Technical textiles and strategic resilience

Technical textiles are essential inputs for defence and other critical value chains, including healthcare, construction, transport, energy, and personal and environmental protection. Products such as protective clothing are strategic goods for which European production capacity is increasingly important. As strategic dependencies, particularly on raw materials, components, and specialised inputs, remain a structural concern for the ecosystem's competitiveness and resilience, companies with a broad and integrated industrial base in Europe can play a key role by shortening supply chains, reducing reliance on imports, and preserving the capacity to scale or reorient production when needed.

Sioen: a long history and a global leadership

[Sioen Industries](#) is a family-owned company founded in 1960 and headquartered in Belgium, focused on technical textiles and professional protective clothing. The company has a global footprint: it employs around 6,000 people (of which 850 are in Belgium) and operates across more than 20 countries, with over 30 locations worldwide in Europe, the US, Asia and Australia. In 2024, the group reported consolidated turnover of EUR 703 million. The group operates through three divisions that together span the full textile value chain: Technical Textiles (extrusion of synthetic yarns, weaving and non-wovens, and the coating of technical fabrics), Colouring Solutions (fine chemicals such as pigment pastes, inks and varnishes), and Protective Clothing (professional protective and work garments).

Controlling the value chain to serve a wide portfolio of strategic sectors

The defining feature of Sioen's model is that several critical production stages are kept in-house and largely within Europe. The group weaves and coats its fabrics, produces pigments and dyes through its chemicals division, and manufactures the finished garments itself. By internalising these steps, the company gains control over quality, traceability and lead times, and limits its dependence on third-country suppliers. Sioen is selectively relocating labour-intensive garment production to lower-cost countries, including in Asia, while continuing to invest in higher-value production and logistics activities in Europe. For example, Sioen is investing in a new hall in Belgium (Ardooie) for the production of sun-protection products, whereas in Italy, the company is expanding its geotextile production, manufacturing specialised textiles for road and infrastructure works.

This integrated, European base translates into the capacity to serve a range of strategic markets, including:

- *Defence and security.* Through its dedicated units, [Sioen Ballistics](#) and Sioen Military, the group designs, manufactures and tests ballistic and stab-resistant protection, including overt, covert and tactical vests, hard plate carriers, shields, explosive ordnance disposal (EOD) suits and chemical, biological, radiological and nuclear (CBRN) defence suits. End users include armed forces, police and

law-enforcement bodies, United Nations missions and humanitarian organisations. The group maintains in-house ballistic testing laboratories in both Belgium and Finland.

- *Public safety and emergency response.* Sioen is the European market leader in firefighter clothing and has supplied protective garments to fire services for decades. Its ability to control the full supply chain from yarn to finished product within Europe was a decisive factor in winning a major tender to clothe French firefighters, where European production was an explicit requirement.
- *Maritime safety.* The group produces life jackets, flotation and immersion suits and certified marine fire-safety kits, as well as military dry suits, maritime tactical vests and military lifejackets.
- *Energy, infrastructure and industry.* The group's technical textiles serve construction and infrastructure (geotextiles, tensile architecture and tarpaulins), transport and automotive, and energy and industrial applications.

Across these markets, the group manufactures around 3.5 million protective and work garments a year.

Innovation for circularity at the end of life

In late 2024, Sioen partnered with [Resortec](#), a leader in textile eco-design and end-of-life waste management, to create workwear that combines durability with circularity, while meeting the highest safety standards. More specifically, the innovation consisted of integrating heat-dissolvable sewing threads (Smart Stitch), which facilitate garments being automatically disassembled at the end of life.

Another field of innovation is improving product traceability to enhance the information available to consumers by adding woven QR codes to all garments. Some of the products, particularly Fire Fighting PPE, already feature RFID tags. Most of the company's apparel production sites will place QR codes by the end of 2026, integrating them into the manufacturing process.¹²

Conclusion

Sioen illustrates how a vertically integrated and predominantly European industrial base can contribute to the resilience and open strategic autonomy of the EU textiles ecosystem. The model also reflects the wider competitiveness logic of the Transition Pathway: durable leadership in high-value-added, hard-to-replicate segments, supported by in-house research, testing, and certification. While full vertical integration on this scale reflects decades of investment and cannot be reproduced in the short term, the underlying principles offer transferable lessons for other technical-textile and protective-equipment manufacturers seeking to strengthen the resilience and strategic relevance of European production.

¹² See related pledge here: <https://transition-pathways.europa.eu/textiles/pledges/sioen-pledges-improve-product-traceability-and-enhance-information-available>

Conclusions

The practices presented in this report confirm that the transition towards a greener, more digital and resilient textiles ecosystem is moving from ambition to implementation. The 10 initiatives published on the EU Textiles Ecosystem Platform between February and June 2026 show practical pathways to sustainability, circularity, digitalisation, resilience and social responsibility across many stages of the value chain, from raw materials and fibre production to manufacturing, repair, reuse and end-of-life management. The best practices address key issues for the transition:

- 1) **How to reduce the environmental footprint of textile production along the value chain:** collective, pre-competitive actions, as in the European Outdoor Group's carbon initiative, help individual companies influence suppliers they could not reach on their own, while investment in cleaner technologies allows industrial producers such as E. Miroglio to grow more sustainably. Digitalisation can play a key role in contributing to the environmental footprint of textile production. New business models incorporating digital technologies, such as on-demand microfactories, can tackle important issues like overproduction at its root by producing only what has already been sold.
- 2) **How to create value from pre-consumption waste:** whether textile scraps become new materials and furniture, or residues from the tannery process become fertilisers and bio-stimulants, industrial symbiosis turns by-products into value for other value chains. Industrial symbiosis models, however, require partnerships among waste holders, manufacturers, and established brands to achieve the scale and market acceptance that make circularity work in practice.
- 3) **How to make circular business models viable from a business perspective:** repair services and product-as-a-service or take-back models, as shown by the United Repair Centre and MUD Jeans, extend the life of garments and demonstrate that circularity can be a viable business. At the same time, awareness-raising initiatives, such as those implemented by Humana People to People and Viitor Plus in Romania, are central to changing consumers' choices and to embracing circularity.
- 4) **How to increase the resilience and strategic autonomy of the European textiles ecosystem:** the Sioen example shows how a vertically integrated and predominantly European industrial base can contribute to the European open strategic autonomy by serving markets such as defence, security, public safety, and emergency response.