



# Textiles

**Cradle to Cradle**

**Industrial Transformation Roadmap**

## Navigating Towards Sustainability in the Textile Industry

The textile sector is considered an “important part of the European manufacturing industry” according to the European Union. In 2021, 1.3 million Europeans were employed in a job considered part of the textiles industry and the turnover of the same year sat at €147 billion, which puts it at a little more than half of the turnover of the plastics industry in the same year<sup>1</sup>. A little less than half is the amount of textile waste that is generated per capita in Europe in comparison to plastic waste: 16kg of textile waste (in 2020)<sup>2</sup> in comparison to 36.1kg of plastic packaging waste (in 2021)<sup>3</sup>. In 2020, out of almost 7 million tons of total textile waste, a little over 80% came from clothing or household textiles that had been used, making it post-consumer waste. It is difficult to estimate the numbers of pre-consumer waste as minimal data is available from member states. However, it is assumed that up to 9% of all textiles available in the European market are destroyed before even being sold to the consumer. That percentage amounts to almost 600 000 tons of textiles that are produced to essentially be immediately discarded.

In addition to the topic of waste, the European textile industry is facing substantial challenges, as laid out by the European commission. These include:

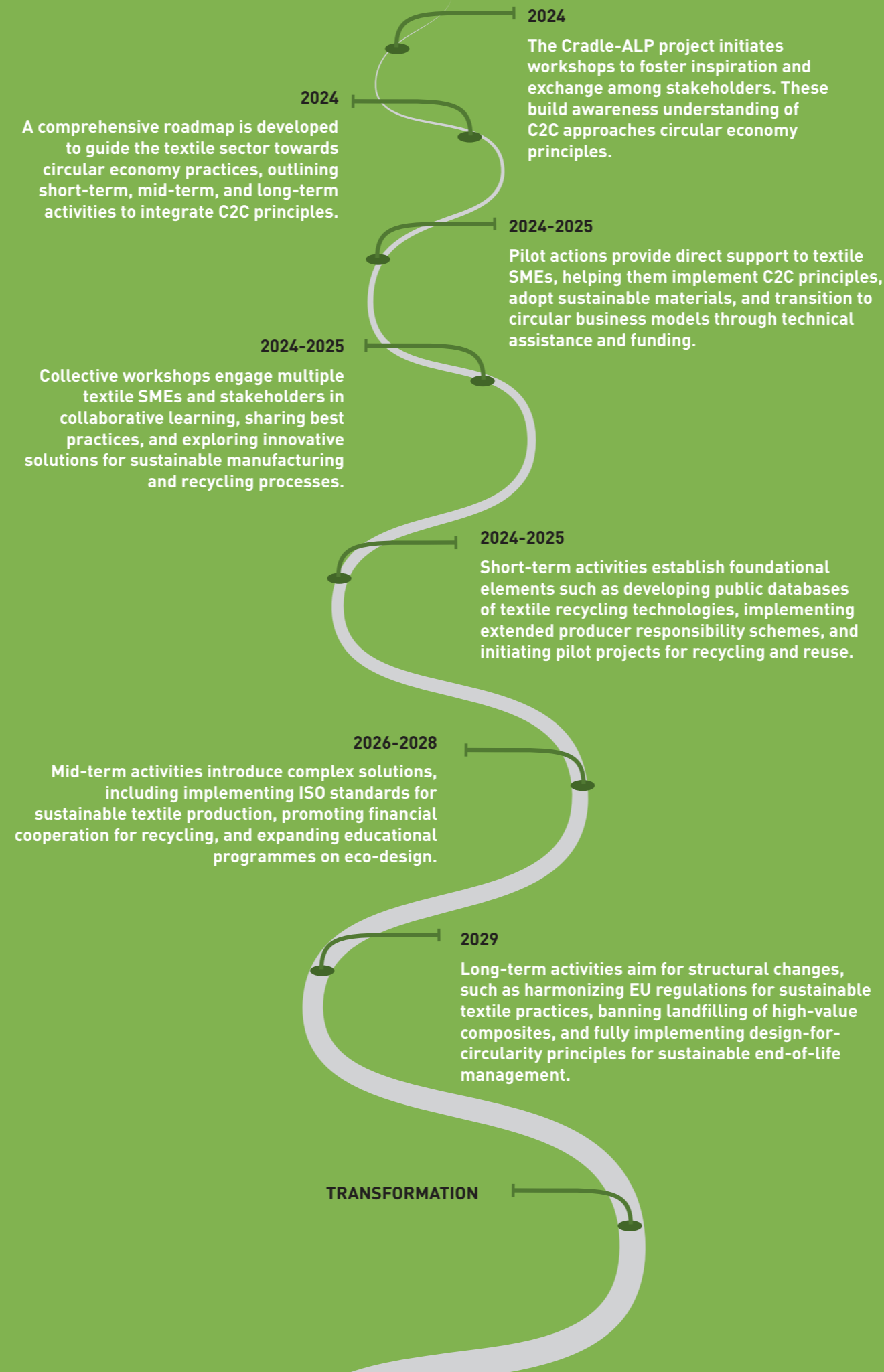
- Low profit margins
- Fierce international competition
- High labor costs
- High costs of compliance with existing environmental and chemical legislation

While all these factors are of course valid and understandable disadvantages, the European Union, and the players within should not be discouraged in their efforts to continue fostering a strong textile industry. Especially in terms of specialization and high-quality production that integrates new materials, the EU has a significant advantage over textile sectors in other countries or regions. In addition, directives like the Waste Framework Directive add new guidelines to the handling, sorting and recycling of textile waste. This directive introduced Extended Producer Responsibility (EPR), which holds producers accountable for the entire lifecycle of textile products. By January 1, 2025, Member States are required to implement textile waste collection systems. Under the umbrella of the Cradle-ALP project, which is a part of the Interreg Alpine Space programme, experts from industry, business support organizations, and research institutions developed a transformation roadmap for the textile industry, which guides companies through the whole adaptation process.

<sup>1</sup> [https://single-market-economy.ec.europa.eu/sectors/textiles-ecosystem/textiles-leather-fur\\_en](https://single-market-economy.ec.europa.eu/sectors/textiles-ecosystem/textiles-leather-fur_en)

<sup>2</sup> <https://www.eea.europa.eu/publications/management-of-used-and-waste-textiles#:~:text=The%20EU%2D27%20generated%20an,up%20in%20in%20mixed%20household%20waste.>

<sup>3</sup> <https://www.europarl.europa.eu/topics/en/article/20181212ST021610/plastic-waste-and-recycling-in-the-eu-facts-and-figures#:~:text=Each%20person%20living%20in%20the,was%2016%2C13%20million%20tonnes.>



## The Cradle-ALP Transformation Roadmap

This roadmap is designed to guide the industry through a strategic and phased approach to achieve significant environmental and economic benefits, ultimately reducing the ecological footprint of textile materials. The roadmap was developed considering two focal points: non-fashion textiles (e.g.: fibers for carpets) and functional wear (e.g.: outdoor clothing, work wear etc.).

In 2024, the Cradle-ALP project initiates workshops to foster inspiration and exchange among stakeholders, building awareness and understanding of C2C approaches and circular economy principles. Collective workshops engage multiple SMEs from the textile industry and stakeholders in collaborative learning, sharing best practices, and exploring innovative solutions for sustainable manufacturing and recycling processes.

From 2024 to 2025, pilot actions provide direct support to textile SMEs, helping them implement C2C principles, adopt sustainable materials, and transition to circular business models through technical assistance and funding. Short-term activities establish fundamental elements like the funding of research for use of recycled fibres in clothing, promotion of mono-material use and initiating pilot projects for recycling and reuse.

In the mid-term, from 2026 to 2028, more complex solutions are introduced, including the automation of sorting technologies for materials, the building up of logistics for the collection of textiles and the development of financial incentives for textile recycling. Between 2029 and 2033, long-term activities aim for structural changes, such as the establishment of a dedicated waste industry for textiles with reliable certification systems.

Ultimately, Cradle-ALP seeks to drive the transition to a circular economy, leveraging collaboration and innovation to promote sustainable practices among SMEs. This ambitious project aims to secure a resilient, eco-friendly future for the Alpine region, aligning economic growth with environmental stewardship.

## Transformation Roadmap for Textile

Short-term (2024-2025)	
Technology	<p><b>Sorting of materials and resources:</b></p> <ul style="list-style-type: none"> <li>Develop sorting lines that sort for material and not only quality for second-hand.</li> </ul> <p><b>Research &amp; development:</b></p> <ul style="list-style-type: none"> <li>Research funding for use of recycled fibers in clothing.</li> </ul> <p><b>Mono materials:</b></p> <ul style="list-style-type: none"> <li>Promote use of mono-materials to manage recycling better.</li> </ul> <p><b>Transparency &amp; awareness building:</b></p> <ul style="list-style-type: none"> <li>Increase transparency in supply chains and introduce product passports.</li> </ul>
Business Model Approaches	<p><b>Transparency &amp; awareness building:</b></p> <ul style="list-style-type: none"> <li>Raise interest/awareness through good design &amp; marketing.</li> </ul> <p><b>Promote textiles in the loop:</b></p> <ul style="list-style-type: none"> <li>Promote textiles that can be kept in the loop already.</li> </ul> <p><b>Design for circularity:</b></p> <ul style="list-style-type: none"> <li>Innovative pilot projects close to the end-user and workshops for designers and recyclers.</li> </ul> <p><b>Dealing with fast fashion:</b></p> <ul style="list-style-type: none"> <li>Promote good quality textiles and make fast fashion less attractive.</li> </ul> <p><b>Recycling &amp; re-usability:</b></p> <ul style="list-style-type: none"> <li>Find partners for recycling of mixed materials in order to diversify expertise.</li> <li>Conduct a scenario analysis study.</li> </ul> <p><b>Investment &amp; incentives:</b></p> <ul style="list-style-type: none"> <li>Introduce a repair bonus similar to Austrian regulation for old electrical appliances EAG.</li> </ul> <p><b>Logistics &amp; recovery:</b></p> <ul style="list-style-type: none"> <li>Develop logistics structure to get textiles from consumer households.</li> </ul>
Legal and Political Framework	<p><b>Regulatory measures &amp; taxation:</b></p> <ul style="list-style-type: none"> <li>Implement regulatory measures like taxes to promote sustainable clothing.</li> </ul> <p><b>Funding &amp; incentives:</b></p> <ul style="list-style-type: none"> <li>Fund projects for digital product passes for textiles.</li> </ul> <p><b>Transparency, education &amp; awareness:</b></p> <ul style="list-style-type: none"> <li>Start education earlier to raise awareness and counteract fast fashion.</li> </ul>

Mid-term (2026-2028)	
Technology	<p><b>Sorting of materials and resources:</b></p> <ul style="list-style-type: none"> <li>Implement automated sorting technologies for materials.</li> </ul> <p><b>Research &amp; development:</b></p> <ul style="list-style-type: none"> <li>Increase research on biobased fibers and niche products.</li> </ul>
Business Model Approaches	<p><b>Transparency &amp; awareness building:</b></p> <ul style="list-style-type: none"> <li>Showcase good practice examples, e.g. in material &amp; resources, design for circularity, etc.</li> </ul> <p><b>Recycling &amp; re-usability:</b></p> <ul style="list-style-type: none"> <li>Highlight the economic benefit of textile recycling through academic research.</li> </ul> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>Encourage use of mono-materials not only for technical clothing but also for fashion items.</li> </ul> <p><b>Logistics &amp; recovery:</b></p> <ul style="list-style-type: none"> <li>Build up logistics for collection of textiles.</li> </ul>
Legal and Political Framework	<p><b>Regulatory measures &amp; taxation:</b></p> <ul style="list-style-type: none"> <li>Reduce taxation for recycled fibers and implement restrictions and laws at the EU level.</li> </ul> <p><b>Funding &amp; incentives:</b></p> <ul style="list-style-type: none"> <li>Develop financial incentives for textile recycling.</li> </ul> <p><b>Transparency, education &amp; awareness:</b></p> <ul style="list-style-type: none"> <li>Include voluntary targets for recycled fiber in big companies and continue awareness efforts.</li> </ul>

Long-term (2029-2033)	
Technology	<p><b>Research &amp; development:</b></p> <ul style="list-style-type: none"> <li>Introduce innovative materials into the market ensuring they are competitively priced.</li> <li>Develop technologies and processes for efficient material recovery aiming for zero waste.</li> </ul>
Business Model Approaches	<p><b>Transparency &amp; awareness building:</b></p> <ul style="list-style-type: none"> <li>Strengthen networks to support widespread adoption of best practices.</li> </ul> <p><b>Recycling &amp; re-usability:</b></p> <ul style="list-style-type: none"> <li>Implement 2nd and 3rd use of textiles, emphasizing reuse and recycling.</li> </ul> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>Establish more textile recycling companies and integrate other sectors.</li> </ul> <p><b>Investment &amp; Incentives:</b></p> <ul style="list-style-type: none"> <li>Incentivise the development of new business models, e.g. concept stores for secondhand fashion.</li> </ul>
Legal and Political Framework	<p><b>Regulatory measures &amp; taxation:</b></p> <ul style="list-style-type: none"> <li>Enforce Corporate sustainability due diligence directive (CSDDD) and national supply chain laws.</li> </ul> <p><b>Funding &amp; incentives:</b></p> <ul style="list-style-type: none"> <li>Develop financial incentives for textile recycling.</li> </ul> <p><b>Transparency, education &amp; awareness:</b></p> <ul style="list-style-type: none"> <li>Continue education and awareness building efforts for children and adults.</li> </ul> <p><b>Recycling &amp; waste industry:</b></p> <ul style="list-style-type: none"> <li>Establish a dedicated waste industry for textiles with reliable certification systems.</li> </ul>

# Interreg



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## Alpine Space

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### Cradle-ALP



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### Cradle-ALP

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You can find out more about the project at:  
<https://www.alpine-space.eu/project/cradle-alp/>