TEX-BREIN – Interregional community of TEXtile ecosystems for the circular transition: Building capacities, REINforcing network and organisations

D2.3 - CAPACITY BUILDING AND MENTORING GUIDELINES FOR REGIONAL SUPPORT ECOSYSTEM STAKEHOLDERS AND APPLYING SMES

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EXECUTIVE SUMMARY

TEX-BREIN (Project 101180358) is an EU-funded initiative under the European Innovation Council and SMEs Executive Agency (EISMEA) aimed at building innovation capacity for textile ecosystems across Europe. The project supports the transformation towards a circular economy, in line with the EU Strategy for Sustainable Textiles.

This report, Deliverable 2.3 - Capacity building and mentoring guidelines for regional support ecosystem stakeholders and applying SMEs, describes the development and presents the tool **"Mentoring Guidelines for SMEs and Ecosystem stakeholders: Upskilling in Textile Circularity"** as part of Task 2.4 – Capacity building and mentoring guidelines for regional support ecosystem stakeholders and SMEs. The general aim of this task is to develop a tool for capacity building for direct application by the SMEs involved in WP3 - *SMEs engagement; portfolio of project ideas definition* and WP4 - *Re Hubs pilot cases*, but also for future replication action promoted by support ecosystem stakeholders like cluster or sectoral associations.

The tool was developed with contributions and validation from the various stakeholders in this ecosystem, including project partners, SMEs and other relevant stakeholders.

The Mentoring Guidelines for SMEs and Ecosystem stakeholders: Upskilling in Textile Circularity tool, provides information on a range of topics relevant to textile circularity, such as:

(i) Circular economy;
(ii) Design for circularity / Eco Engineering;
(iii) Technologies for circularity and recycling;
(iv) DPP – Digital Product Passport;
(v) EPR – Extended Producer Responsibility.

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1. INTRODUCTION

1.1 TEX-BREIN PROJECT

The TEX-BREIN project aims to strengthen innovation capacity within European textile ecosystems by promoting sustainable and resilient value chains aligned with the EU Strategy for Sustainable and Circular Textiles.

Its core objective is to support the circular transformation of the textile industry through enhanced interregional cooperation among stakeholders from the quadruple helix—public authorities, businesses, research institutions, and civil society. The project seeks to reduce disparities between more and less developed regions by fostering the transfer of knowledge, successful models, and good practices, particularly in textile recycling and circular waste management.

TEX-BREIN is designed to encourage long-term collaboration between textile regions across Europe. It will promote sustainable links among industrial textile areas and enhance the capacity of public entities and innovation intermediaries to assist SMEs in shaping interregional investment portfolios. A special focus is placed on upskilling the sector's workforce and supporting SMEs in adopting circular and innovative production processes that help reduce textile waste and environmental impact.

A key output of the project will be the development of a portfolio of 20 business cases, including three focused on designing textile recycling centres in less developed regions.

The partnership brings together eight organizations from six European regions, creating a balance between more developed regions, Tuscany (Italy), Catalonia (Spain), and Västra Götaland (Sweden), and less developed ones, Severovýchod (Czech Republic), Norte (Portugal), and Łódzkie (Poland).

By promoting knowledge exchange and supporting regional innovation ecosystems, TEX-BREIN aims to contribute to the transformation of the textile sector into a more circular, sustainable, and inclusive industry, where innovation bridges the gap between different levels of regional development.

1.2 WP2 - CAPACITY BUILDING

Work Package 2 goal is the deployment of capacity building activities aiming at enhancing the skills of the different stakeholders to boost innovation in the value chains linked to the recycling in the textile sector making them more prepared to participate in the I3 instrument. WP2 is bridging WP1, where the mapping of regional innovation ecosystems and business environments is done, with WP3, that will support the ideation of 20 investment projects designed to stimulate cross-border and cross-sector collaboration. WP2 capacity building programme will not only enhance the skills and knowledge of participant SMEs but also of the TEX-BREIN partner staff, and will also seed contacts and networking thus fostering a coherent and reinforced innovative environment.

The foreseen tasks in WP2 include: T2.1 - Definition and T2.2 - implementation of an overall capacity building programme to foster innovation and business building with specific activities for each targeted audience, namely clusters, support organisations, SMEs and re-Hubs staff; T2.3- Organisation of learning expeditions to visit established textile re-Hubs in more developed regions and one of the rehubs in a less developed region that is being 'designed' within the TEX-BREIN; Partner participation in international conferences on the topic (e.g. the Circular & Biobased Textiles Innovation event organised by European Technology Platform for the Future of Textiles and Clothing); T2.4 - Development of mentoring guidelines to support innovation intermediaries and applying SMEs.

This Deliverable 2.3 - *Capacity building and mentoring guidelines for regional support ecosystem stakeholders and applying SMEs* is produced under task 2.4 – *Capacity building and mentoring guidelines for regional support ecosystem stakeholders and SME*.

2. METHODOLOGY

The methodology used to develop this tool, Mentoring Guidelines for SMEs and Ecosystem stakeholders: Upskilling in Textile Circularity, involved several stages of development and validation with the various stakeholders in the circular textile ecosystem.

1) Identification of the most relevant areas for this ecosystem and those with the greatest need for upskilling - based on an analysis of feedback from other work packages and tasks, as well as: Feedback from surveys; Webinars and Learning Expeditions; Information from WP1 results; Information from SMEs working on WP3 and the Experiences of consortium partners.

2) A questionnaire aimed at companies engaged on the Mini-Business Plans for the ideas proposed in WP3. This helped to identify the key upskilling needs across the various areas related to the circular textile sector, as well as the profile of employees in the organization, that might be interested in these topics.

3) Gathering relevant information on various topics, such as reports, projects, tools and training opportunities, with contributions from project partners who have extensive experience and expertise in this field.

4) Preparation of the tool.

5) Tool validation by the project partners, SMEs and other stakeholders in a workshop held online, on 28 April 2026.

6) Finalisation of the tool and promotion in the project's media channels, as well as through relevant dissemination activities organised by each partner in conjunction with these stakeholders.

3. MENTORING GUIDELINES FOR SMES AND ECOSYSTEM STAKEHOLDERS: UPSKILLING IN TEXTILE CIRCULARITY

3.1 INTRODUCTION

This document, Mentoring Guidelines for SMEs and Ecosystem Stakeholders: Upskilling in Textile Circularity, presents a practical tool developed within the TEX-BREIN project to support small and medium-sized enterprises (SMEs) in the textile sector in addressing the challenges of the circular economy. It provides structured guidance and relevant knowledge to support companies in their transition toward more circular practices.

This tool brings together a set of curated resources—including reports, tools, training materials, projects, and relevant regulations—into a single document. Allowing companies and stakeholders to quickly find and use relevant information on textile circularity in one place, without having to consult multiple sources. The structure of the guideline also allows it to be reused and adapted by clusters, innovation hubs, and sectoral associations, supporting wider uptake across the textile ecosystem.

This document is intended for textile SMEs, Advanced manufacturing SMEs working with textiles, Clusters and business associations, Innovation agencies, and Circular economy project managers. Each thematic section provides curated resources with direct links to relevant content, supporting mentors in guiding SME capacity-building activities and helping companies advance in their transition toward circular practices.

The guideline is part of the broader TEX-BREIN project, which focuses on strengthening innovation capacity in European textile ecosystems. The project promotes collaboration between regions, supports the development of circular value chains, and encourages the adoption of advanced and digital solutions, particularly in less developed regions.

3.2 MENTORING METHODOLOGY

These guidelines can be used in different situations and for different target audiences. As previously mentioned, target audience of this tool could be, Textile SMEs, Advanced manufacturing SMEs working with textiles, Clusters and business associations, Innovation agencies and Circular economy project managers. Depending on the target audience, it will be necessary to tailor the mentoring to suit that audience, for example, focusing more on design for circularity and recycling or a Digital Product Passport, etc.

Mentoring pathway

These guides can be used to learn a little more about a specific topic; in such cases, it is recommended begin by consulting existing reports, articles and regulations relating to the relevant field, and if need more detailed information, can search for Training activities, for example.

This tool can also be used to support training and mentoring initiatives on these topics. In this context, the proposed methodology should follow these steps:

i) Needs assessment - to identify the participants' needs for further knowledge, so that the training can be structured accordingly.

ii) Design the training programme - Based on the needs previously identified and the latest information gathered on the various topics, activities are planned.

At this stage, it may be useful to research the various topics covered in this guide in order to gain an understanding of the diversity they offer, including use the training courses and webinars presented in the tool. In the case of corporate training, it may be helpful to look for examples of successful use or application (in projects and initiatives), as these can help to clarify the concept and the application.

Mentors curate specific articles and reports from the guide to address identified gaps.

iii) Implementation - This involves delivering training activities, which may take various formats (face-to-face, online or blended). During the delivery of these training activities, you may use this tool at different stages of the training. The tool can be used to encourage participants to conduct research; content from some of the references in this guide can be presented to introduce concepts and showcase successful project case studies. It can also be used to provide participants with tools and platforms for applying and experimenting with certain concepts.

iv) Evaluation - Once the training (the acquisition of knowledge) is complete, it is important to assess whether the activity was really useful for the trainees. Each mentor will have their own methods of evaluation, but this guide also helps you find other training courses and relevant information to develop evaluation tools for this initiative.

Mentoring tools

To maximize the value of this guideline, the following tools serve as bridges between the repository and the mentee:

- Navigational Scorecards: Simple checklists that help mentees find relevant modules within the guide based on their current stage (e.g., "I am starting with Eco-engineering" vs. "I am preparing for DPP").
- Regulatory Translators: Templates that break down complex EU circularity legislation (cited in your guide) into operational requirements for specific business departments.
- Collaboration Logs: Shared documents used to track which reports, articles, or initiatives from the guide have been applied, facilitating discussions during mentoring sessions.

- Digital Benchmarking Tools: Links to external platforms referenced in the guide that allow SMEs to compare their progress in waste reduction and material circularity.

Capacity Building

Capacity building focuses on turning the passive content in the guide into active industry competencies through:

- Thematic "Learning Sprints": Intensive, guided sessions focused on single pillars from the guide, such as "Design for Circularity" or "Recycling Technologies," utilizing the included training activities.
- Peer-to-Peer Innovation Circles: Facilitated groups where SMEs share their experiences applying the guide's resources, fostering cross-industry problem-solving and partnership building.
- Expert-Led "Clinic" Days: Dedicated sessions where stakeholders can ask technical experts to explain specific regulations or technologies identified within the guide's initiatives section.
- Train-the-Trainer Modules: Structured guides within the repository that enable internal leaders to conduct in-house workshops, ensuring circular knowledge permeates the entire organization.

3.3 Replication for Clusters and Associations

Clusters and Associations play a central role in fostering collaboration, knowledge transfer, and innovation within textile ecosystems.

This tool is designed to support replication by these actors, allowing them to adapt and further develop its content in line with their strategic priorities, including relevant policy frameworks, as well as their operational activities involving SMEs.

Its flexible structure enables alignment with specific areas of activity and regional characteristics, facilitating its use across different contexts while supporting SMEs in addressing local challenges related to Textile Circularity.

3.4 THEMATIC SECTIONS

Given the importance of the concept of circularity, there are several relevant thematic areas, which are sometimes interrelated.

This guide sets out five thematic areas: Circular Economy - the case of Textiles; Design for circularity/ Eco-Engineering; Technologies for Circularity and Recycling; Digital Passport and Extended Producer Responsibility.

In each thematic area, the information is always organised in the same way to make the guide easier to use (see Figure 1). It begins with a brief introduction, followed by an explanation of why the topic is relevant, and then presents the most relevant resources available on the subject: Reports, Articles and Regulations; Projects and Initiatives; Tools and Platforms; Training activities and entities.

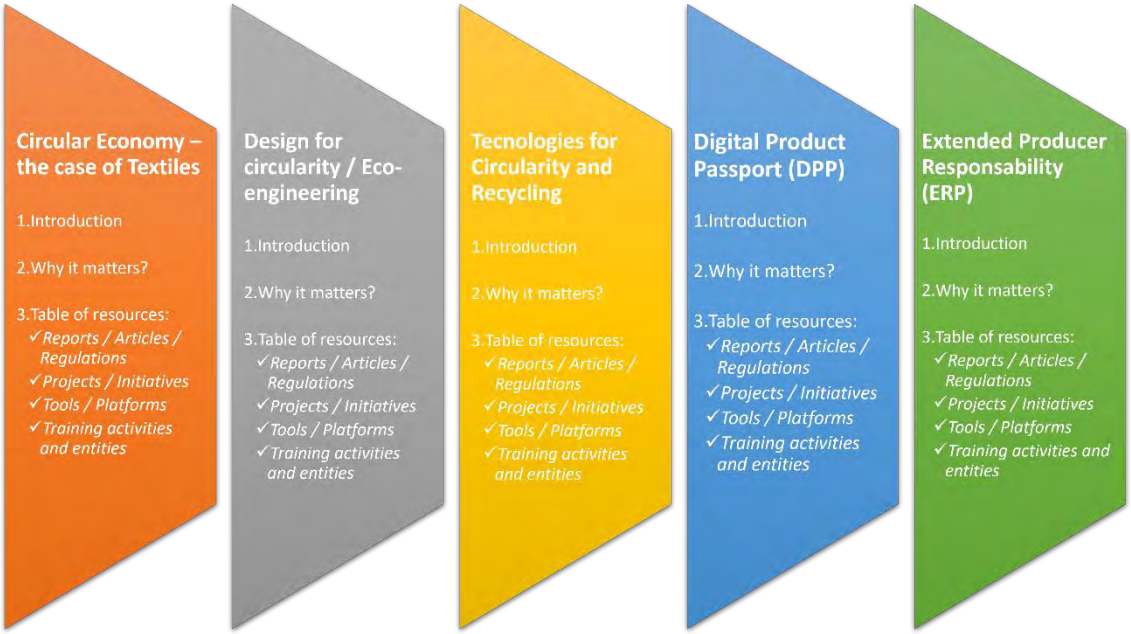


Figure 1 - Thematic Sections of the Mentoring Guidelines for SMEs and Ecosystem stakeholders: Upskilling in Textile Circularity

4. CIRCULAR ECONOMY - THE CASE OF TEXTILES

4.1 INTRODUCTION

The transition to a circular economy is becoming a defining priority across industries. Driven by environmental pressures, stricter regulations, and evolving consumer expectations, organisations are moving away from the traditional "take, make, dispose" model toward systems that prioritise resource efficiency, reuse, and long-term value creation. Embracing circularity is no longer optional—it is essential for resilience, competitiveness, and sustainable growth.

Within this broader shift, the textile sector presents distinct challenges and opportunities. Characterised by complex global value chains, diverse materials, and rapid production cycles, the industry faces particular difficulty in implementing circular practices at scale. At the same time, it is under increasing scrutiny due to its environmental footprint, making it a key focus area for circular innovation and policy action.

Despite growing momentum, the transition remains complex. Information is often fragmented across reports, regulatory frameworks, projects, and initiatives, websites and platforms, while the skills required to operationalise circular strategies are still emerging. As a result, stakeholders may struggle not only to identify the right actions, but also to develop the internal capabilities needed to implement them effectively.

This tool is designed to address these challenges within the textile ecosystem. It provides access to essential resources on textile circularity while supporting mentoring, learning, and skills development. By connecting users with relevant reports, regulations, projects, initiatives, tools, platforms, and training opportunities, it helps build knowledge, strengthen capacity, and foster continuous improvement across the sector.

4.2 Why circular economy is important for SMEs and Ecosystem stakeholders in Textile Circularity?

The circular economy is increasingly relevant for SMEs and ecosystem stakeholders as a practical response to rising operational, regulatory, and market challenges. Rather than focusing only on reducing environmental impact, it offers a framework to optimise resource use, reduce dependency on volatile raw material markets, and unlock new business opportunities. For SMEs, in particular, circular strategies can support cost control, improve supply chain resilience, and create added value through services, innovation, and closer customer relationships.

In the textile sector, this relevance becomes even more pronounced due to its structural complexity and resource intensity. Textile circularity requires rethinking how products are designed, used, and recovered—moving toward longer lifecycles, improved material recovery, and more efficient systems. For SMEs, this can translate into tangible advantages, such as diversifying revenue streams through repair or resale services, improving material efficiency, and aligning with increasing requirements around product traceability, eco-design, and waste management.

However, these opportunities can only be fully realised through coordinated action across the ecosystem. Textile circularity depends on the interaction between multiple actors, from material suppliers and manufacturers to collectors, recyclers, and policymakers. Stronger collaboration enables better infrastructure for collection and sorting, more consistent material flows, and the development of scalable circular solutions.

At the same time, circular approaches in textiles can act as a driver for innovation and local economic development. They support the emergence of new technologies, services, and business models, while also creating employment opportunities in areas such as repair, reuse, and recycling.

In this sense, circular economy is not just a guiding principle, but a concrete and strategic tool for SMEs and stakeholders in the textile sector to adapt, innovate, and strengthen their position within an evolving industrial landscape.

4.3 CONTENTS

The main sources of information on the CIRCULAR ECONOMY, emphasising the textile case, are presented below: Table 1 lists reports, articles and regulations, Table 2 lists projects and initiatives and Table 3 presents the main tools and platforms. Finally, Table 4 provides information on training, educational activities and organisations that typically work in this field.

Table 1 - Circular Economy - Reports, articles and regulations

REPORTS, ARTICLES AND REGULATIONS			
TYPE	AUTHOR	TITLE (YEAR) LINK	BRIEF SUMMARY
ARTICLE	AGH University of Kraków (Poland)	Circular Economy Implementation in Poland (Packaging Sector) (2026) LINK	Describes concrete regulatory tools: deposit systems, plastic taxes, recycled content mandates—signals future extension to textiles. (MDPI)
ARTICLE	Vogue Business	Can Clothing Repair Grow Beyond Niche? (2026) LINK	This article examines the potential and limitations of scaling clothing repair within the fashion industry, highlighting its growing importance for sustainability despite economic and operational challenges.
POLICY	European Commission	First circular economy action plan (2026) LINK	Identifies textiles as a priority value chain; promotes sustainable production, waste reduction, and circular business models.
POLICY	European Commission	Sustainable and Circular Textiles Strategy (on going 2026) LINK	This publication outlines the EU strategy to address the significant environmental impact of textile consumption by transforming how textiles are produced and consumed across their entire lifecycle.
POLICY	IAPMEI - Agência para a Competitividade e Inovação, Portugal	**Plano de Ação para a** Economia Circular 2025 -2030 (2026) LINK	This page presents Portugal's Circular Economy Action Plan 2025-2030, outlining the national strategy and measures to promote resource efficiency, reduce waste, and support sustainable economic transition.

REPORT	European Investment Bank	Transitioning to a circular economy: Closing the investment gap in Europe (2026) LINK	The report shows that gaps are most significant in circular design and end of life infrastructure, and in key sectors such as construction, batteries and vehicles, and textiles. It also highlights persistent market failures and investment barriers and outlines how EU regulation can help markets to develop and how coordinated EU and EIB financing and advisory action can mobilise investments and accelerate Europe's circular transition.
REPORT	United Nations Environment Programme, Quenia / Queensland University of Technology	Supporting the transition to a sustainable textile value chain: the role of environmental permitting systems (2026) LINK	The objective of this report is to examine how, and the extent to which, environmental permitting systems regulate the environmental impacts of textile value chain activities.
ARTICLE	OECD - Organisation for Economic Co-operation and Development	Economic instruments for a resource-efficient circular economy (2025) LINK	The OECD article examines how economic instruments (such as taxes, subsidies, deposit-refund systems, and extended producer responsibility schemes) can support the transition to a circular economy by influencing behaviour across the product lifecycle, while assessing their effectiveness and identifying policy gaps.
ARTICLE	European Environment Agency	Circular Material Use Rate - Poland (2025) LINK	Poland's circular material use rate is still low (~7.5%), indicating significant opportunity for SMEs to innovate in recycling and reuse. (Agencja Środowiska Europejska)

ARTICLE	Technical University of Denmark; JRC	An empirical exploration of the unintended effects of circular economy policies in the European Union (2025) LINK	This study investigates unintended (indirect) effects of circular economy policies, focusing on the textile sector in the EU. It aims to understand and categorise these effects to improve ex-ante impact assessments (assessments done before a policy is adopted).
ARTICLE	Vogue Business	Circular Fashion & Trade Barriers (HS Codes Issue) (2025) LINK	Shows regulatory gaps in global trade affecting recycling, reuse, and circular supply chains.
ARTICLE	Gdańsk University of Technology	Circular Economy in Poland: Good Practices and Recommendations (2025), LINK	Identifies CE implementation tools (e.g., green public procurement, lifecycle extension) and highlights economic & environmental benefits for businesses.
ARTICLE	Directorate-General for Environment	Exploring textiles and the circular economy: Study recommends tools to assess and address the unintended effects of new policy (2025) LINK	A new study explores the potential unintended effects of EU policies promoting a circular economy. It provides recommendations to improve future policy design, using the textile sector as a case study.
ARTICLE	M. Auezov South Kazakhstan University and South Kazakhstan State Pedagogical University	A Systematic Review and Meta-Analysis of Studies on the Circular Economy in Textiles (2025) LINK	This review covers 273 scientific publications from 2009-2024 and is useful for a broad evidence base on textile circularity.

ARTICLE	Polytechnic of Porto, Portugal	Circular Business Strategies in the Portuguese Textile and Clothing Industry (2025) LINK	This study analyses how Portuguese textile companies implement circular strategies, highlighting a focus on product longevity and resource efficiency while identifying gaps in areas like repair and personalization.
ARTICLE	European Environment Agency	Circularity of the EU textiles value chain in numbers (2025) LINK	This briefing supports the EU strategy on sustainable and circular textiles by providing data and insights to improve circularity across the value chain and reduce environmental impacts.
ARTICLE	Rochester Institute of Technology, USA and The REMADE Institute, USA	Circular Economy in the Textile Industry: A Review of Technology, Practice, and Opportunity (2025) LINK	The textile industry's rapid growth has increased waste, but current recycling technologies are limited in scalability, compatibility, and effectiveness. The paper concludes that broader changes in product design and business models are likely more impactful for reducing waste than recycling alone.
MANIFESTO	EuRIC- European Recycling Industries' Confederation	**EU Recyclers' Manifesto: Increasing textiles** circularity by 2030 (2025) LINK	In this Manifesto, EuRIC's Textiles Branch presents five key policy recommendations to increase circularity in the textiles sector by 2030
POLICY	Ellen MacArthur Foundation	Keep it in use: Retain resource value and unlock economic opportunities (2025). LINK	Clarifies that policies designed to keep products and materials in use at their highest value can reduce waste while unlocking economic opportunities.

POLICY	European Council of the European Union	The circular economy explained (2025) LINK	This provides an overview of the European Union's circular economy strategy, showing how the EU seeks to replace the traditional "take-make-use-dispose" model with a more sustainable system that keeps resources and products in use for longer, minimizes waste, and reduces environmental impact.
REPORT	Circle Economy and Deloitte	The Circularity Gap Report 2025 (2025) LINK	This report is a global assessment of how circular the world economy is, revealing that only a small share of materials used are recycled or reused and highlighting systemic gaps that must be closed to accelerate the transition to a truly circular economy.
REPORT	European Environment Agency - European Topic Centre Circular economy and resource use	**ETC CE Report 2025/7 Measuring Europe's** textiles circularity - through the lenses of the EEA Circularity Metrics Lab (2025) LINK	This report aims to address these gaps by identifying key data streams and evaluating textile circularity in Europe using the Circularity Metrics Lab framework, building on previous studies and supporting upcoming EEA and ETC reports on textiles and the circular economy.
REPORT	European Commission	Textiles Ecosystem Transition Pathway - Best practices report (2025) LINK	The report features both collective actions and company-led innovations, spanning a wide range of ecosystem segments and geographies. Each best practice offers a replicable model for others and illustrates the power of collaboration, innovation, and commitment.

REPORT	European Environment Agency	**Measuring Europe's textiles circularity** - through the lenses of the EEA Circularity Metrics Lab (2025) LINK	Report on textile circularity indicators in Europe. Useful for measurement and monitoring because it focuses on indicators, data reliability, and how to assess the state of circularity in practice.
REPORT	European Environment Agency	Circular Economy in the Textile Industry: Policy and international practice mapping (2025) LINK	This kind of policy-oriented report is useful for implementation examples, especially for municipalities, reuse, sorting, and recycling systems.
ARTICLE	Some universities in Poland	**Study of Lodz Society's Knowledge of the** Circular Economy in the Textile and Clothing Industry (2024) LINK	This study examines the adoption of circular business models in the textile industry, highlighting growing interest in repair and second-hand markets while emphasizing the need to better guide consumer behaviour toward sustainability.
MANUAL	MedWaves, the UNEP/MAP Regional Activity Centre for SCP (former SCP/RAC) in collaboration with Innovation house	Guide to Best Available Practices in Circular Economy for the textile sector (2024) LINK	The objective of this manual on best practices for the textile sector is to equip companies with the tools and knowledge necessary to implement sustainable and circular improvement strategies effectively.
ARTICLE	Some universities in Poland	Circular Economy in Textile & Clothing Industry - Consumer Study (Łódź) (2024) LINK	Shows growing interest in repair, second-hand, and resale models in Poland, but low adoption of rental models—important for SME business model design. (Paradigm)

ARTICLE	Birmingham City University and Aston University,UK	A comprehensive review of circular economy research in the textile industry (2024) LINK	This review synthesizes 132 primary documents from 2014-2023 and maps the main research themes, especially sustainability-oriented innovation and transition challenges.
POLICY	European Commission	EU Strategy for Sustainable and Circular Textiles (2024) LINK	This strategy sets out a vision for a sustainable and innovative textile sector, promoting extended producer responsibility, safer products, and wider access to reuse and repair services.
POLICY	Circular Cities and Regions Initiative	EU Strategy for Sustainable and Circular Textiles - Implementation (2024) LINK	Practical breakdown of policy tools (design rules, anti-greenwashing, product passports) for implementation.
POLICY	European Commission (CORDIS)	The Future of Textiles: Achieving a Circular Economy (2024) LINK	Highlights EU-funded innovations (recycling, materials, digitalization) and sector transformation pathways.
REPORT	Science Park Borås, Sweden	12 scenarios shaping a sustainable tomorrow (2024) LINK	This report presents an analysis of Swedes' attitudes towards different sustainable futures. How desirable do they find them? How likely? Why? And what futures seem actionable enough to make them happen? By answering these questions, we sketch out a map of the future.
REPORT	CGR CIRCLE ECONOMY	The Circularity Gap Report Textiles (2024) LINK	This is a key sector-specific benchmark report that examines material flows across the textile value chain and highlights the sector's low circularity.
ARTICLE	Vogue Business	EU Fashion Regulation Overhaul Guide (2023) LINK	Overview of upcoming regulations: ESPR, microplastics restrictions, transparency rules impacting SMEs.

ARTICLE	University of Lodz, Poland	Innovative Textiles Industry and its Future Within the Concept of Circular Economy (2023) LINK	Analyses textile production, trade, and circular economy integration in Poland and globally; highlights need for innovation and alignment with EU priorities.
ARTICLE	European Environment Agency	**Investigating Europe's secondary raw material** markets (2023) LINK	This report assesses secondary raw material markets in the EU, highlighting the textile sector's weak performance and the need for stronger standards, data, and policy support to advance circularity.
ARTICLE	Riga Technical University, Latvia	Analysis of Textile Circularity Potential (2023) LINK	This paper uses multi-criteria decision analysis to assess circularity potential across textile product streams and is helpful for methodological and sectoral comparisons.
ARTICLE	Polish Academy of Sciences, Poland	Circular Economy Indicators - Wielkopolska Region (2023) LINK	Develops metrics to measure circular economy progress at regional level—useful for SMEs benchmarking sustainability performance.
POLICY	European Commission	Corporate Sustainability Reporting Directive (CSRD) (2023) LINK	EU rules require large companies and listed companies to publish regular reports on the social and environmental risks they face, and on how their activities impact people and the environment.
PUBLICATION	University of Lodz	Innovative Textiles Industry and its Future Within the Concept of Circular Economy (2023) LINK	Academic Research that Analyses textile production, trade, and circular economy integration in Poland and globally; highlights need for innovation and alignment with EU priorities.

REPORT	INNOWO Institute for Innovation and Responsible Development	Circularity Gap Report Poland (2023) LINK	This report analyses Poland's circularity performance, highlighting its potential to significantly increase resource efficiency and reduce environmental impacts through targeted strategies.
REPORT	United Nations Environment Programme	Sustainability and Circularity in the Textile Value Chain - A Global Roadmap (2023) LINK	This report outlines a roadmap for achieving a circular textile sector, defining key priorities and actions for different stakeholder groups to drive coordinated progress.
REPORT	Security & Sustainability	Circularity Gap Report 2023 (2023) LINK	Circularity Gap Report 2023 presents the latest global assessment of circularity, showing that the world economy is only 7.2% circular.
REPORT	United Nations Environment Programme	Sustainability and Circularity in the Textile Value Chain: Global Roadmap (2023) LINK	This is one of the most important system-level references because it maps the full value chain, identifies hotspots, and outlines priority actions for a circular transition.
POLICY	Italian Ministry of the Environment and Energy Security	Italian National Strategy for Circular Economy (2022) LINK	Italy's National Strategy for Circular Economy identifies the administrative and fiscal tools designed to strengthen the secondary raw materials market in terms of availability, performance and costs; contribute to the achievement of climate neutrality objectives; and implement a roadmap of actions and measurable targets up to 2035.

POLICY	European Commission	Strategy for Sustainable and Circular Textiles (2022) LINK	This document sets out the EU's vision for transforming the textile sector by 2030, focusing on durability, circularity, reduced waste, and stronger environmental and social standards across the value chain.
POLICY	TU Delft	Circular Economy: An Introduction (2021) LINK	Focus on implementing circular strategies in companies, including product-as-a-service and resource efficiency.
REPORT	JRC European Commission	Circular Economy Perspectives in the EU Textile sector (2021) LINK	This study analyses circular economy opportunities in the EU textile sector, examining value chains, waste flows, and technologies while highlighting challenges and solutions for improving circularity.
POLICY	European Commission	Circular Economy Action Plan (2020) LINK	Identifies textiles as a priority value chain; promotes sustainable production, waste reduction, and circular business models.
POLICY	Ministerio para la Transición Ecológica y el Reto Demográfico, Spain	**España Circular 2030: the new Circular** Economy Strategy for a #FuturoSostenible in Spain (2020) LINK	The publication presents Spain's Circular Economy Strategy, España Circular 2030, as a long-term roadmap for shifting toward a more sustainable, decarbonized, and resource-efficient economy by reducing material use, waste generation, and water consumption while promoting reuse and recycling.
PUBLICATION	Polish Academy of Sciences	Indicators for Monitoring Circular Economy in Poland (2020) LINK	Defines measurement system for CE transition (materials, waste, innovation); useful for reporting and KPI design.

REPORT	Ellen MacArthur Foundation	The circular economy: a transformative Covid-19 recovery strategy - How policymakers can pave the way to a low carbon, prosperous future (2020). LINK	Shows how adopting circular economy-oriented policies and directing investment into ten identified opportunities across key sectors (including, fashion) can help policymakers guide post-COVID-19 stimulus toward a resilient, low-carbon, and prosperous economic recovery.
ARTICLE	European Environment Agency	**Textiles in Europe's Circular Economy** (2019) LINK	Explains environmental impacts of textiles and role of circular business models and regulation.
POLICY	Polish Government	Roadmap towards Circular Economy (Poland) (2019) LINK	National strategy focusing on resource efficiency, waste reduction, and innovation across sectors including textiles. Provides framework aligned with EU CE policies.
POLICY	DGE - Direção-Geral da Economia	Economia Circular (2019) LINK	This site presents the circular economy framework in Portugal, highlighting how it enables resource efficiency, waste reduction, and the promotion of sustainable business practices.
REGULATION	Jornal Oficial da República Portuguesa	**Plano de Ação para a Economia Circular em** Portugal **- Resolução do Conselho de Ministros** n. 190-A/2017, de 11 de dezembro (2017) LINK	It sets out the national strategy for the transition from a linear to a circular model. It includes measures for reuse, repair, recycling and resource efficiency. It is Portugal's main policy and strategic instrument.
POLICY	Ministry of Environment, Portugal	Leading the transition: A circular economy action plan for Portugal (2017) LINK	Presents Portugal's circular economy action plan as a roadmap for reducing waste, improving resource efficiency, and expanding reuse, recycling, remanufacturing, and circular design.

Table 2 - Circular Economy - Projects and Initiatives

PROJECTS, INITIATIVES			
TYPE	ACRONYM	TITLE (YEAR) LINK	BRIEF SUMMARY
INITIATIVE	Design-for-Recycling	Design-for-Recycling for packaging (ongoing) WEBSITE	An initiative by the European Commission and the Joint Research Centre, featuring a range of activities and presentations on this topic, available via this link.
INITIATIVE	Hubs4Circularity	Hubs4Circularity Community of Practice WEBSITE	This is a European initiative that promotes collaboration between industries, cities, and regions to accelerate the transition to a circular economy. It supports the development of circular ecosystems by sharing knowledge, best practices, and innovative solutions that improve resource efficiency, reduce waste, and contribute to Europe's climate-neutrality goals.
PROJECT	CEMTEX	Closing the loop on Circular Medical Textiles for the transition to a Circular Economy (2025 - 2029) WEBISTE	This project promotes the shift from disposable to reusable medical textiles by strengthening collaboration across the value chain to reduce waste, save resources, and create new business opportunities.
PROJECT	ICARUS	ICARUS - Increasing circularity in Process Industry by upcycling secondary resources (2024-2027) WEBSITE	Develops innovative ways to upcycle industrial residues (e.g. steel slag, cellulose waste) into high-quality secondary raw materials for new applications.

PROJECT	3D-CIRCULAR	Digital Deep tech Driven Circular (2025 -2029) WEBSITE	The 3D-CIRCULAR project is an EU-funded initiative that develops advanced education and training programmes combining digital deep-tech and circular economy principles to reskill and upskill the workforce for Europe's green and digital transition.
PROJECT	Skills4Circularity	Upskilling and reskilling the textile industry sector to face the challenges in recycling, traceability and certification of recycled products (2025 - 2029) WEBSITE	Skills4Circularity is an Erasmus+ project that helps the European textile industry develop the green, digital, and circular-economy skills needed for sustainable production, recycling, traceability, and future workforce resilience.
PROJECT	ELEVATEX	Joint cluster initiative to leverage innovation and cooperation for the resilience, twin-transition, recovery, and global competitiveness of European textile value chains (2025 -2028) LINKEDIN	This project aims to accelerate the green and digital transition of the textile industry by boosting SME innovation, competitiveness, and collaboration across the value chain.
PROJECT	MATRIX	Mediterranean Pathway for Circular Textiles (2025 - 2028) WEBSITE	This project focuses on reducing the textile industry's environmental impact by transforming the design phase and equipping SMEs with tools to adopt circular, resource-efficient, and digitally enabled practices.
PROJECT	CIRCULess	UpCycling mIneral and timbeR-based waste from Construction & manUfacturing process industries through eco-design, advanced logistics, quality control and digital solutions (2024 - 2027) WEBSITE	Aims to transform construction and demolition waste into valuable resources through advanced processing and circular product design.

PROJECT	CIRCULATEX	Fostering circularity in the textile sector: innovative interoperable solutions and best practices for implementation and harmonization of EPR schemes (2025 - 2028) WEBSITE	Circula-TEX is a Horizon Europe project that aims to support the EU strategy for Sustainability and Circular Textiles. The project seeks to redesign textile value chains by developing circular economy strategies aligned with Extended Producer Responsibility (EPR) policies.
PROJECT	THREADs	Textile and Habiliment Reuse for the Environment and NPA Area Development (2024 - 2027) WEBSITE	This project develops strategies for sustainable textile waste management in the NPA region, improving waste quality, fostering collaboration, and supporting the transition to a circular textile industry.
PROJECT	CircSyst	Circular Systemic Solutions for Plastic, Packaging, Bio-Waste, and Water (2024 - 2027) WEBSITE	Focuses on large-scale systemic solutions for circularity, including wastewater reuse, biowaste valorisation, and sustainable packaging, with pilot systems designed for replication across Europe.
PROJECT	W2W (Wood-to-Wood)	A Wood-to-Wood Cascade Upcycling Valorisation Approach (2024- 2027) WEBSITE	Enhances reuse and recycling of wood waste using innovative sorting, treatment, and digital tools like product passports.
PROJECT	TEX-BREIN	Interregional community of TEXtile ecosystems for the circular transition: Building capacities, REINforcing network and organisations (2024 - 2026) WEBSITE	This project supports innovation in European textile ecosystems by strengthening resilient, digitalised value chains and promoting circular solutions through interregional collaboration.

PROJECT	LIFE-CIRTECHTEX	Implementation of Circular Economy Processes to Reduce Textile Waste in the Manufacture of Personal Protective Equipment (PPE) (2023 - 2026) WEBSITE	LIFE-CIRTECHTEX develops circular economy solutions to recycle technical textile waste into high-quality personal protective equipment (PPE) fabrics.
PROJECT	RegioGreenTex	Strengthening textile circularity in E**urope's** regions (2023-2025) WEBSITE	RegioGreenTex is a project promoting the collaboration in research and development for the textile industry between the four major sectors of society - industry, government, research institutes, and the public - in establishing a systematic circular economy business model across the EU.
PROJECT	InvestCEC	Investment in Circular Economy Cities and Regions (2022 - 2025) WEBSITE	Supports cities and regions in implementing circular economy strategies through replicable models and investment frameworks.
PROJECT	AddTex	Advancing industrial digital and green innovations in the advanced textile industry through innovation in learning and training (2022 - 2025) WEBSITE	AddTex aimed to foster digitalisation and green innovation in the advanced textile materials sector through knowledge transfer, co-creation, and innovative learning approaches.
PROJECT	CERES	Circular Economy Redesigning Skills (2022 - 2025) LINK	CERES redesigns higher-education and vocational-training curricula to equip learners and professionals with the skills needed for the circular economy.
PROJECT	Hi-Tech-TEX	New sustainable and cross-sectorial value chains towards excellence in Hi-Tech Textiles to foster the uptake of innovation and increasing competitiveness (2022 - 2024) WEBSITE	This project aimed to strengthen textile clusters and foster strategic partnerships, enhancing SME competitiveness and industrial modernisation through cross-sectoral collaboration and emerging technologies.

Table 3 - Circular Economy - Tools and Platforms

TOOLS, PLATFORMS			
TYPE	TITLE (YEAR) LINK	AUTHOR	BRIEF SUMMARY
CALCULATOR	Circulytics: Measuring circular economy performance LINK	Ellen MacArthur Foundation	Measuring and reporting on progress towards circular economy outcomes is a key driver in the transition to the circular economy. It plays a powerful role in setting direction, showing progress, identifying opportunities, and demonstrating impact.
GLOSSARY	Textile Taxonomy & Glossary LINK	RegioGreenTex. Developed by Wageningen University	Explains key terms related to circular textiles, recycling, digital traceability, and sustainable innovation to ensure a common understanding across all project stakeholders.
GLOSSARY	The circular economy glossary (2021) LINK	Ellen MacArthur Foundation	A glossary designed to increase understanding of the circular economy. It includes definitions for commonly-used terms such as recycle, reverse logistics, and finite resources. It also explains the difference between virgin, non-virgin, and renewable materials, biological and technical cycles, and reuse, refurbishment, and remanufacturing.

GUIDES	The Circular Garment Demonstrator LINK	RegioGreenTex project	Presents practical examples and tools to demonstrate how circular design and production can be applied in the garment industry, helping organizations transition toward more sustainable and resource-efficient models.
GUIDES	Textile Circularity Guide - to transform waste into a resource LINK	RegioGreenTex project	Offers practical guidance on transforming textile waste into valuable resources, supporting organizations in adopting circular approaches across the textile value chain.
GUIDES	GUIDEs about Circularity LINK	be@t project	Several Guides about Good Practices for Circularity.
METRICS	Circularity Metrics Lab - textiles LINK	European Environment Agency	Circularity Metrics
PLATFORM	CORDIS - EU research results (updating) LINK	European Commission	The European Commission has published a complete list of ongoing and completed European projects on this topic.
PLATFORM	CCRI Projects (updating) LINK	European Commission	The CCRI Projects site of the European Commission is other place to find projects with relevant contributions to Circular Systemic Solutions implementation.
PLATFORM	**Eco OPPORTUNITIES - Opportunities for Circular and sustainable Industrial solutions** (updating) LINK	PRODUTECH R3 project (Work Packaging Digital4Circular)	This platform helps businesses identify opportunities and solutions for circular business models, improving resource efficiency through integrated modules for materials, products, and surplus.

PLATFORM	**Circular Economy** (updating) LINK	UNECE - United Nations Economic Commission for Europe	Relevant information about the Circular Economy, definitions, news, events, articles, etc.
PLATFORM	**THE CIRCULAR HUB by TÈXTILS.CAT** (updating) LINK	TÈXTILS.CAT	The Circular Hub by Tèxtils.CAT is a collaborative platform that promotes circularity in the advanced textile materials sector through training, innovation, networking, and a marketplace for textile waste valorization.
PLATFORM	**Pacte per a la Moda Circular (Circular Fashion Pacto f Catalonia**) (updating) LINK	Agència de Residus de Catalunya	The Pacte per a la Moda Circular is a voluntary agreement that unites textile sector stakeholders in Catalonia to accelerate the transition toward a more circular and sustainable fashion industry.
PLATFORM	EU Textiles Ecosystem Platform LINK	European Commission	Access updated information through resources
PODCAST	The Circular Economy Show Podcast (updating) LINK	Ellen MacArthur Foundation	The Circular Economy Show Podcast explores the many dimensions of what a circular economy means, and meets the people making it happen. Each week our hosts are joined by experts from across industry, governments and academia to learn more about how the circular economy is being developed and scaled.

PRESS RELEASES	**Circular Economy Press Releases** (updating) LINK	UNECE - United Nations Economic Commission for Europe	Several Press Releases about the Thematic
TOOL	RegioGreenTex Digital Tool LINK	RegioGreenTex project	RegioGreenTex. Developed by Ariadne Innovation

Table 4 - CIRCULAR ECONOMY - Training activities and entities

TRAINING (activities and entities)			
TYPE	TITLE LINK	INSTITUTION	MORE INFORMATION
ONLINE COURSE	Sustainability and the Circular Economy LINK	Michael J. Readey, Ph.D | University Colorado Boulder, SIEMENS	COURSERA platform; Flexible; Recurrent; 2 weeks - 10hr/week - 6 modules
ONLINES COURSE	Business Sustainability in the Circular Economy LINK	Alan Pilkington | University of London	COURSERA platform; Flexible; Recurrent; 8hr - 3 modules
ONLINE COURSE	AddTex - Smart, Digital and Green Skills Academy LINK	AddTex partnership	9 short innovative training courses delivered virtually through a MOOC and completed by case studies - 3 on smart textiles, 3 on digital transitions and 3 on green transition

ONLINE COURSE	Curso de Economia Circular LINK	Bureau Veritas	This training course equips professionals with the knowledge and strategies to adopt circular practices, reduce waste, and improve resource efficiency while generating economic and environmental benefits.
ORGANIZATION	**Institut cirkulární ekonomiky - Zavádíme cirkulární ekonomiku do praxe** LINK	INCIEN	Offers practical, hands-on programs designed to help organizations implement circular economy principles and turn sustainability strategies into measurable results.
ORGANIZATION	CIRA Advisory s.r.o. - Circular economy LINK	CIRA Advisory	As a consultancy, CIRA Advisory s.r.o. offers expert advisory services in circular economy, supporting organizations in developing strategies, identifying opportunities, and implementing sustainable business models.
ORGANIZATION	Economia Circular: Recolha, Triagem e **Reciclagem de Têxteis; Economia Circular na ITV: estratégias e recursos** (*among other courses*) LINK	Academia CITEVE	A training academy offering a wide range of courses, in various formats and covering a variety of areas of interest to the textile industry.
ORGANIZATION	MODATEX - The *Centre* for the Professional *Training* of the Textile, Apparel, Clothing and Wool Industry LINK	MODATEX	MODATEX is a Portuguese vocational training centre dedicated to developing skills and qualifications for professionals in the textile, clothing, fashion, and wool industries through education, upskilling, and sector-specific training programs.

ORGANIZATION	Textile engineering and Fashion Design and Marketing training programmes LINK	University of Minho	Textile engineering and Fashion Design and Marketing training programmes.
WEBINAR	Introduction to the Circular Economy in the Textile Industry LINK	TEX-BREIN Project	TEX-BREIN Webinar 3 advanced circular textile strategies through key project insights on innovation and ecosystem collaboration.

5. DESIGN FOR CIRCULARITY / ECO-ENGINEERING

5.1 INTRODUCTION

This tool is designed to support mentoring and skills development for SMEs and other stakeholders working on DESIGN FOR CIRCULARITY and ECO-ENGINEERING. It brings together relevant knowledge, guidance, and resources to help users strengthen their capabilities in creating textile products that are more durable, repairable, reusable, recyclable, and resource-efficient.

By making key information more accessible, the tool aims to facilitate learning, support informed decision-making, and encourage the practical application of circular design principles across the textile value chain. In this way, it contributes to the continuous improvement of skills and to the broader transition toward a more circular textile sector.

5.2 WHY DESIGN FOR CIRCULARITY / ECO ENGINEERING IS IMPORTANT FOR SMES AND STAKEHOLDERS' ECOSYSTEM IN TEXTILE CIRCULARITY?

Design for Circularity and Eco-engineering are fundamental to the transition toward a more sustainable textile sector because they influence a product's environmental impact from the very beginning. By embedding circular principles at the design stage, SMEs and other stakeholders can create textiles that are more durable, repairable, reusable, recyclable, and resource-efficient, while also reducing waste and extending product life.

For SMEs, this approach offers both environmental and strategic benefits. It can help reduce dependence on virgin materials, improve resource efficiency, lower long-term costs, and strengthen compliance with evolving sustainability and circular economy requirements. At the same time, it supports innovation by enabling companies to develop products and services that respond to changing market expectations and regulatory demands.

For the wider stakeholder ecosystem, Design for Circularity and Eco-engineering are equally important because they improve coordination across the value chain. Designers, brands, manufacturers, recyclers, collectors, researchers, and policymakers all benefit from products that are easier to repair, disassemble, sort, and recover at end of life. This creates more efficient systems for reuse and recycling and supports stronger links between production, consumption, and recovery.

Ultimately, this field helps transform circularity from a long-term ambition into practical action. By designing with circularity in mind, the textile sector can move away from linear models and build a more resilient, innovative, and value-generating ecosystem.

5.3 CONTENTS

The main sources of information on the DESIGN FOR CIRCULARITY and ECO-ENGINEERING, are presented below: Table 5, lists reports, articles and regulations, Table 6, lists projects and initiatives and Table 7, presents the main tools and platforms. Finally, Table 8, provides information on training, educational activities and organisations that typically work in this field.

Given that this topic is closely linked to circularity, the information on circularity is also recommended for consultation (4. CIRCULAR ECONOMY - the case of textiles).

Table 5 - DESIGN FOR CIRCULARITY / ECO-ENGINEERING - Reports, articles and regulations

REPORTS, ARTICLES AND REGULATIONS			
TYPE	AUTHOR	TITLE (YEAR) LINK	BRIEF SUMMARY
ARTICLE	Kharazmi University, Iran	A robust flexible programming model for product design in circular economy incorporating end-of-life quality and regulatory compliance (2026) LINK	The study presents a methodology to simultaneously determine optimal product design and end-of-life (EOL) strategies within a circular economy framework. It introduces a profit-maximization model that incorporates costs, revenues, and the quality of returned parts as key decision factors.
REPORT	JUSTFASHION, University of Antwerp	ESPR Implementation Roadmap: What it means for fashion & textiles SMEs (2026) LINK	This is one of the most consequential rules for textile circularity because it enables product-level requirements on durability, repairability, recyclability, and information disclosure.
REGULATION	European Commission	Ecodesign for Sustainable Products Regulation (ESPR) (2022 - ongoing) LINK	Establishes design requirements for durability, recyclability, and environmental performance of products including textiles.

ARTICLE	ZHAW Zurich University of Applied Sciences, Switzerland and University of Applied Sciences Upper Austria, Austria	Towards a framework for automatic disassembly supporting circular economy (2025) LINK	This paper explores Design for Assembly and Design for Disassembly, highlighting their role in enabling automated production and supporting circular economy practices such as repair, reuse, and efficient resource recovery.
ARTICLE	European Environment Agency	Circular design and sustainable production (2025) LINK	This briefing assesses Europe's progress toward sustainable production, emphasizing the key role of product design in improving circularity, reducing environmental impacts, and enabling reuse, repair, and recycling.
ARTICLE	Universities from USA and Dinamark	A review of disassembly systems for circular product design (2025) LINK	This paper reviews Design for Disassembly methods and introduces a systems engineering framework to analyze disassembly processes, highlighting key factors that influence circularity and product recovery performance.
ARTICLE	Agency for Science, Technology and Research, Singapore	Design for Circularity: A Framework for Sustainable Product Redesign (2024) LINK	This paper presents a design framework based on four R-strategies to enhance product circularity, demonstrated through a case study and validated with a comparative life cycle assessment.
ARTICLE	Fraunhofer Institute for Chemical Technology ICT, Germany	Reverse-engineering for improved end-of-life and circularity of PLA beverage cups (2024) LINK	This paper introduces a reverse engineering approach to analyze manufacturing processes and identify improvements for end-of-life treatment, enhancing product circularity and reducing lifecycle gaps.

ARTICLE	UNECE - United Nations Economic Commission for Europe	Designing and Planning for Circularity (2024) LINK	This article highlights the importance of designing products and systems for durability, repairability, and recyclability, emphasizing the role of regulation and long-term planning in supporting circular economy goals.
ARTICLE	Parma University, Italy and Tuscia University, Italy	Product Eco-Design in the Era of the Circular Economy (2024) LINK	This paper explains how eco-design supports the transition to a circular economy by enabling durable, modular, and recyclable products that reduce environmental impacts while improving business performance.
ARTICLE	European Environment Agency	Circular Economy requirements in Ecodesign (2024) LINK	This article examines how the EU has expanded ecodesign regulations to support circular economy goals, focusing on durability, repairability, and lifecycle sustainability across a growing range of products.
BOOK CHAPTER	University of Patras and Aristotele University of Thessaloniki, Greece	Design for Circularity, Design for Adaptability, Design for Disassembly (2024) LINK	This chapter outlines key design approaches for circularity, adaptability, and disassembly in building projects, highlighting principles and strategies to support modularity and resource efficiency.
REGULATION	European Parliament and European Council	Ecodesign for Sustainable Products Regulation (ESPR) (2024) LINK	This regulation establishes a new EU framework to improve the environmental sustainability of products across their entire lifecycle, supporting circular economy goals and replacing the previous Ecodesign Directive.

ARTICLE	Universidade del Norte, Colombia	Design for circularity and durability: an integrated approach from DFX guidelines (2023) LINK	This article develops a set of design guidelines for circularity and durability by classifying DFX rules, providing a practical tool to support circular product design.
REPORT	Produced by Deloitte AS; Commissioned by WWF-Norway	Design for Circularity (2023) LINK	This report defines product design criteria to support the Global Plastic Pollution Treaty, emphasizing the need for harmonized standards to improve durability, reuse, and recyclability while reducing plastic waste.
REPORT	European Commission	Ecodesign for Sustainable Products Regulation - Preliminary study on new product priorities (2023) LINK	This study identifies priorities for new product development, outlining its methodology and presenting an initial ranking of product options.
REPORT	RE:Source, Sweden	The Innovation Agenda for Sustainable Use of Resources (2021) LINK	Describes the innovation area of sustainable use of resources, which aims to support solutions that contribute to the efficient use of the earth's resources within the planetary boundaries.

Table 6 - DESIGN FOR CIRCULARITY / ECO-ENGINEERING - Projects and initiatives

PROJECTS, INITIATIVES			
TYPE	ACRONYM	TITLE (YEAR) LINK	BRIEF SUMMARY
PROJECT	GREEN MANTIS	Green Manufacturing and Advanced Net-zero Technology Innovations (2025 - 2028) LINK	This EU-funded project brings together key clusters to support collaboration across the manufacturing and energy value chains, helping companies adopt innovative net-zero and energy-efficient technologies.
PROJECT	Cir4Fun	Advancing European Industrial Sustainability and Competitiveness through Circular Design Strategies, Digital Product Passports, and Sustainable Product-Service Systems in the Furniture Sector (2025 - 2027) LINK	This project aims to transform the furniture industry by applying circular economy principles across the lifecycle, using digital tools to improve sustainability, compliance, and consumer engagement.
PROJECT	DIAMETER	Demonstration of a sustainable circular-by-design manufacturing system based on additive manufacturing (2024 - 2028) LINK	This project develops solutions to support the metal manufacturing sector's transition to a circular economy, using hybrid manufacturing and digital tools to optimise processes.
PROJECT	DeCo	Design Collaboration for Sustainable Business (2024 - 2028) LINK	This project supports EU goals on emissions reduction and sustainable products by promoting circular business models and showcasing best practices in circular design and production across regions.

PROJECT	REDYSIN	Resource-efficient processes for the production and circularization of innovative RECYclable-by-DeSIGN fresh meat smart packaging from wood (2023 - 2027) LINK	This project develops innovative, wood-based and smart packaging for fresh meat, combining recyclability, resource efficiency, and advanced technologies to improve sustainability and waste management.
PROJECT	Design.2.Transform at PRODUTECH R3	Digital Solutions for Life Cycle Management and Sustainable & Circular Product Development, a Work Package of PRODUTECH R3 project (2022 - 2026) LINK	This project promotes the use of Design-for-X methodologies, modularity, and standardization to enhance product quality, competitiveness, and the integration of circular and sustainable design practices.
PROJECT	Digital4Circular at PRODUTECH R3	Solutions for Sustainability and Circularity based on Digitalization, a WP of PRODUTECH R3 project (2022 - 2026) LINK	This project expands Digital4Circular with new modules to support circular practices, demonstrating them in an industrial setting and leveraging digitalisation and Industry 4.0 technologies to improve evaluation and decision-making.
PROJECT	PIMAP 4 Sustainability	Photonics for International Market and Applications for Sustainability (2022 - 2024) LINK	This initiative boosts SME and company innovation in the metalworking and aerospace sectors by linking European clusters and supporting internationalisation, innovation, and skills development.

Table 7 - DESIGN FOR CIRCULARITY / ECO-ENGINEERING - Tools and platforms

TOOLS, PLATFORMS			
TYPE	TITLE (YEAR) LINK	AUTHOR	BRIEF SUMMARY
GUIDE	Circulator Guide 2 (2023) LINK	H&M GROUP	H&M Group's Circulator Guide is a design framework that helps teams create more circular clothing and products by focusing on customer needs, product purpose, and strategies such as durability, repair, extended use, waste reduction, and recycling, while guiding material choices toward lower footprint, better durability, and higher recyclability.
GUIDE	Eco-Design Strategies (2023) LINK	RegioGreenTex project by Italian Green Tex Hub	Tecnotex's "ECO-Design Strategies" guide offers practical, lifecycle-oriented approaches for the textile industry to embed sustainability into product development, covering material selection, resource-efficient production, durability, repairability, and end-of-life recyclability through actionable checklists, case studies, and performance metrics.
PLATFORM	ECOTEXTILE News (updating) LINK	ECOTEXTILES NEWS	Ecotextile News is an independent environmental news platform dedicated to the global textile and clothing supply chain, offering reporting and analysis on sustainability, social responsibility, regulation, and production across print, digital, podcasts, and a mobile app.

PLATFORM	VETRINE MONITORING TOOL (2025) LINK	VETRINE project	A digital platform that supports green designers and their mentors in the creation of sustainable fashion products
TOOL	Circularity Toolkit (2024) LINK	Science Park Borås	Circularity toolkit is a tool for Actors in the textile value chain how wants guidance in assessing a textile product's or product category's ability to circulate and get inspired to make well-considered decisions about circularity already early in the development process.

Table 8 - DESIGN FOR CIRCULARITY / ECO-DESIGN - Training, activities and entities

TRAINING (activities and entities)			
TYPE	TITLE LINK	INSTITUTION	MORE INFORMATION
COURSE (online)	Green VETRINE: an introduction to sustainable garment design and manufacturing LINK	VETRINE project	The course consists of 5 chapters, each containing 4 learning units, delivered through video lessons and a supporting manual. Each chapter includes a self-assessment tool.
COURSE	Product Design for the Circular Economy LINK	COURSERA	This first course in the Sustainable and Circular Product Development specialization illustrates the product design tools necessary to implement Circular Economy (CE) principles.

COURSE	Technical Short Cycle in Fashion Design LINK	IPCA - Instituto Politécnico do Cávado e do Ave, Portugal	This short-cycle course equips students with the tools and methods to develop fashion products and collections, including clothing and accessories, by integrating creative and manufacturing processes, market analysis, and trend research, while also teaching them about common materials, fabric handling, and the broader context of fashion history and industry.
COURSE	**Técnico de Design de moda** LINK	Árvore - Escola Artística e Profissional	This Fashion Design course teaches students how to develop complete collections for women, men, children, or unisex wear, from initial sketches through pattern making and sewing, and how to present their work effectively via photo shoots or fashion shows.
ORGANAZATION	Fashion Design, Technology and Sustainable Fashion Products training programmes - LINK	UBI - Universidade da Beira Interior	Department of Textile Science and Technology at Universidade da Beira Interior.
WEBINAR	TEX-BREIN Webinar: *Designing for Circularity & Longevity* LINK	TEX-BREIN Project	TEX-BREIN Webinar on October 24, 2025, examined circular design principles to extend textile product lifespans via repair, upgrades, and material recovery.

6. TECHNOLOGIES FOR CIRCULARITY AND RECYCLING

6.1 INTRODUCTION

This chapter presents key knowledge and resources aimed at strengthening the capabilities of companies and stakeholders operating within the circular textile ecosystem. As the industry shifts toward more sustainable and regenerative models, access to reliable information, emerging technologies, and practical tools becomes essential for enabling circularity at scale.

Focusing on technologies that support circular systems and textile recycling, this chapter brings together a curated overview of relevant projects, scientific and technical publications, regulatory frameworks, training opportunities, and digital tools and platforms. These elements are intended to support informed decision-making, foster innovation, and facilitate collaboration across the value chain.

The chapter also explores two critical sub-topics in greater depth. The first, advanced manufacturing for circularity, examines how innovative production processes and design approaches can reduce waste, extend product lifecycles, and enable material recovery. The second, recycling, addresses both textile sorting technologies and recycling methods, highlighting current challenges and advancements in transforming post-consumer and post-industrial textile waste into valuable resources.

These insights empower stakeholders to navigate the transition toward a more circular and resilient textile industry.

6.2 WHY TECHNOLOGIES FOR CIRCULARITY AND RECYCLING IS IMPORTANT FOR SMES AND STAKEHOLDER´S ECOSYSTEM IN TEXTILE CIRCULARITY?

Technologies for circularity and recycling are fundamental enablers of the transition toward a more sustainable and resource-efficient textile industry. They provide the technical backbone needed to reduce waste, retain material value, and transform end-of-life textiles into new resources. By improving how materials are tracked, processed, and reintegrated into production cycles, these technologies make circular systems not

only possible but scalable and economically viable for SMEs and the wider stakeholder ecosystem.

Within this context, particular attention must be given to advanced manufacturing for circularity, which plays a key role in embedding sustainability at the design and production stages. Through approaches such as design for durability, modularity, and disassembly, as well as the use of digital and automated production systems, companies can significantly reduce waste generation and ensure that products are better suited for reuse and recycling.

At the same time, efficient textile sorting and advanced recycling methods are essential to close the loop. High-precision sorting technologies—often supported by automation and artificial intelligence—enable accurate separation of materials, which is critical for achieving high-quality recycling outputs. Innovations in both mechanical and chemical recycling further expand the capacity to process a wider range of textile types, including blended fibers that have traditionally posed significant challenges.

Together, these technological areas reinforce one another: circular design and manufacturing improve the recyclability of products, while advanced sorting and recycling systems ensure that materials can be effectively recovered and reintroduced into the value chain. Strengthening these capabilities is therefore essential for SMEs and stakeholders seeking to remain competitive, compliant, and aligned with the evolving demands of a circular textile economy.

6.3 CONTENTS

The following section presents relevant information on Technologies for Circularity and Recycling, including the topics of Advanced Manufacturing, Circularity, Digitalisation principles and tools and Recycling (Textile Sorting / Recycling Methods). Relevant information on these topics is presented in *Table 9*, Reports, articles and regulations,

Table 10 presents Projects and initiatives, at *Table 11* Tools and Platforms are presented, and the main training courses and organisations offering training in these areas are presented in *Table 12*.

Given that this topic is closely linked to circularity, the information on circularity is also recommended for consultation (4. CIRCULAR ECONOMY - the case of textiles).

Table 9 - TECHNOLOGIES FOR CIRCULARITY AND RECYCLING - Reports, articles and regulations

REPORTS, ARTICLES AND REGULATIONS			
TYPE	AUTHOR	TITLE (YEAR) LINK	BRIEF SUMMARY
ARTICLE	Mälardalen University, Sweden	Enabling Circularity for Production System Design: The Convergence of DfX and R-Principles (2026) LINK	This study explores how Design for X (DfX) methods can be leveraged to implement R-principles and accelerate the transition toward circularity in industrial equipment design.
ARTICLE	Ellen MacArthur Foundation	Keep it in use: Retain resource value and unlock economic opportunities (2025) LINK	Clarifies that policies designed to keep products and materials in use at their highest value can reduce waste while unlocking economic opportunities.
ARTICLE	Kasetsart University, Thailandia and Engineering Department, Provincial Electricity Authority, Thailandia	Analyzing the Impact of Digital Technology Challenges on the Sustainability Performance of MSMEs (2025) LINK	Therefore, this study aims to analyze the digital technology challenges that influence the sustainability performance of small, medium, and micro enterprises (MSMEs).
STUDY	Commissioned by the European Commission	Digital Decade 2025 - Digitalisation of Business in the EU Member States (2025) LINK	This study assesses Member State progress toward policy targets by evaluating effectiveness, identifying common challenges, and highlighting best practices to guide future action.

ARTICLE	Institute of Chemical Technology, India	Textile Waste Management-Innovative Separation Techniques (2024) LINK	This study examines both traditional and advanced separation technologies for managing textile waste to mitigate the environmental impact of the fast fashion industry.
ARTICLE	UNECE - United Nations Economic Commission for Europe	Leveraging Digital Solutions for Circular Economy (2023) LINK	This study provides policy recommendations across economic, technological, social, environmental, and regulatory domains to harness digitalization as a driver for the circular economy transition.
REPORT	European Environment Agency	Digital waste management (2021) LINK	This report examines how digital technologies can enhance waste management and sustainability, analyzing their broader environmental, economic, and social impacts within the context of a circular economy.

Table 10 - TECHNOLOGIES FOR CIRCULARITY AND RECYCLING - Projects and initiatives

PROJECTS, INITIATIVES			
TYPE	ACRONYM	TITLE (YEAR) LINK	BRIEF SUMMARY
PROJECT	PRODUTECH R3	Mobilizing Agenda of the Production Technologies for Reindustrialization (2022 - 2026) LINK	PRODUTECH R3 is a strategic mobilizing agenda designed to drive the green and digital transformation of the Portuguese production technology sector by fostering collaborative innovation and developing advanced industrial solutions.
PROJECT	PRODUTECH DIH	PRODUTECH Digital Innovation Hub (2022 - 2026) LINK	The PRODUTECH Digital Innovation Hub (DIH) is a multi-regional consortium dedicated to accelerating the digital and green transformation of the manufacturing industry by providing specialized support in technology testing, training, investment access, and ecosystem networking.
PROJECT	INTRANSIT	Interregional community of TEXtile ecosystems for the circular transition: Building capacities, REINforcing network and organisations (2022 - 2025) LINK	IN TRANSIT supports the green and digital transition of SMEs in the textile, aerospace, and construction sectors by providing assessment, training, and funding for collaborative innovation.

PROJECT	xBUILD-EU	Cross-fertilization of industrial ecosystems in textile manufacturing and construction leveraging digital and advanced technologies to build up green and digital resilience in Europe (2022 - 2025) LINK	xBUILD-EU is an EU-funded project that supports textile and construction SMEs in adopting circular economy practices through innovation, cross-sector collaboration, training, and access to funding opportunities.
PROJECT	EuroBoosTEX	Joint European Initiative in Textile Industry for **Europe´s recovery boosting digital and green** transition (2022 - 2025) LINK	EuroBoosTEX is an EU-funded initiative that strengthens the resilience, sustainability, and digital transformation of the European textile ecosystem by supporting SMEs through innovation services, training, networking, and financial support.
PROJECT	CLAMTEX	Cluster Management Towards Excellence in Advanced Manufacturing and Textiles Industry (2020 - 2023) LINK	CLAMTEX aims to enhance European cluster management and foster cross-sectoral collaboration to accelerate the adoption of digital innovation through the ClusterXchange pilot scheme.
PROJECT	GALACTICA	Smart industrial innovation as enabler to drive new value chains for textiles and aerospace (2020 - 2023) LINK	GALACTICA aims to foster new industrial value chains in the textile and aerospace sectors by promoting cross-sectoral collaboration and advanced manufacturing to drive long-term European competitiveness and growth.
PROJECT	PRODUTECH 4 S&C	PRODUTECH Susten**tável & Circular** (2017 - 2020) LINK	The PRODUTECH 4 S&C Project is a response from the Production Technologies Industry (PTI) towards the establishment of a circular and sustainable manufacturing industry.

Table 11 - TECHNOLOGIES FOR CIRCULARITY AND RECYCLING - Tools and platforms

TOOLS, PLATFORMS			
TYPE	TITLE (YEAR) LINK	AUTHOR	BRIEF SUMMARY
PLATFORM	CEFLEX - A Circular Economy for Flexible Packaging LINK	CEFLEX Project	CEFLEX Resources hub offers downloadable guidelines, position papers, and tools to design recyclable flexible packaging and advance circular economy practices across the value chain.
PLATFORM	InvestCEC Marketplace LINK	InvestCEC Project	InvestCEC Marketplace connects circular economy startups with cities, regions, and investors to accelerate sustainable urban projects across Europe.
PLATFORM	Portal das Tecnologias de P**rodução** LINK	PRODUTECH Cluster	PRODUTECH Portal showcases Portugal's national offer in production technologies, connecting companies with products, services, solutions, and expertise across key industrial sectors.

Table 12 - TECHNOLOGIES FOR CIRCULARITY AND RECYCLING - Training, activities and entities

TRAINING (activities and entities)			
TYPE	TITLE LINK	INSTITUTION	MORE INFORMATION
ONLINE COURSE	AddTex - Smart, Digital and Green Skills Academy LINK	AddTex partnership	9 short innovative training courses delivered virtually through a MOOC and completed by case studies - 3 on smart textiles, 3 on digital transitions and 3 on green transition.
ONLINE COURSE	Digital transformation in textiles LINK	AddTex partnership	Masterclass about Digital transformation.
TRAINING PLATFORM	Talent - Tech Skills and Masters Studies LINK	28DIGITAL (former EIT DIGITAL KIC)	Different training programmes; also has courses on COURSERA platform.
WEBINAR	Biotechnologies Applied in Textile Processing LINK	TEX-BREIN Project	TEX-BREIN Webinar on January 13, 2026, unlocked the potential of Digital Product Passports (DPP) for transparency, trust, sustainability, and circular value in textiles.
WEBINAR	Extend the Lifespan of Products and their Parts LINK	TEX-BREIN Project	TEX-BREIN Webinar on October 9, 2025, explored strategies to extend textile product lifespans through industrial reconditioning and scaling best practices.

WEBINAR	Innovations in Biobased Fibres and Materials for the Textile Industry LINK	TEX-BREIN Project	TEX-BREIN Webinar on September 25, 2025, showcased innovations in biobased fibres and materials to advance sustainable, circular textiles.
WEBINAR	Overview over High Technology Readiness Levels (TRL) for Circular Textiles LINK	TEX-BREIN Project	TEX-BREIN Webinar on June 18, 2025, provided an overview of high Technology Readiness Levels (TRL) for advancing circular textiles.

7. DIGITAL PRODUCT PASSPORT - DPP

7.1 INTRODUCTION

The Digital Product Passport (DPP) is a key instrument for advancing textile circularity, as it enables the collection, sharing, and accessibility of essential product information across the value chain. By improving transparency on materials, origin, composition, durability, repairability, reuse potential, and end-of-life options. The DPP supports more informed decisions by brands, manufacturers, policymakers, and consumers.

This chapter, presents relevant information on the DPP, including reports, articles, and regulations, as well as projects, initiatives, tools, platforms, training activities, and entities that contribute to its development and implementation. Together, these resources offer an overview of the current DPP landscape and provide practical support for capacity building, mentoring, and the transition toward more circular textile systems.

7.2 WHY DIGITAL PRODUCT PASSPORT IS IMPORTANT FOR SMES AND STAKEHOLDERS' ECOSYSTEM IN TEXTIL CIRCULARITY?

The Digital Product Passport (DPP) is essential for SMEs and the broader stakeholders' ecosystem in textile circularity, as it directly tackles key preparation and implementation challenges while unlocking transformative benefits.

The definition and implementation of the DPP present significant challenges for companies and supply chains, often face difficulties with data collection complexities, IT interoperability issues, high upfront digital tool costs, skill shortages, and limited resources for regulatory compliance—hurdles like those under the EU Ecodesign for Sustainable Products Regulation that can stall circular transitions. The DPP counters these by offering a standardized, accessible framework for sharing transparent data on materials, composition, durability, repairability, reuse potential, and end-of-life options, simplifying reporting and cutting long-term costs without requiring massive investments.

For the wider ecosystem—including brands, suppliers, recyclers, policymakers, and tech providers—the DPP bridges fragmented standards and coordination gaps across supply chains, fostering collaboration, building trust through verifiable data, and driving efficiency toward scalable circularity. By the way, it empowers SMEs to innovate, differentiate in sustainable markets, and integrate into resilient value chains, accelerating industry-wide progress.

7.3 CONTENTS

The following section presents relevant information on DPP. *Table 13* presents reports, articles and regulations, *Table 14* present projects and initiatives. *Table 15* shows Tools and Platforms, and the main training courses and organisations offering training in these areas are presented in *Table 16*.

Given that this topic is closely linked to circularity, the information on circularity is also recommended for consultation (4. CIRCULAR ECONOMY - the case of textiles).

Table 13 - DIGITAL PRODUCT PASSAPORT - Reports, articles and regulations

REPORTS, ARTICLES AND REGULATIONS			
TYPE	AUTHOR	TITLE (YEAR) LINK	BRIEF SUMMARY
ARTICLE	PESCO-UP project	Digital product passports: the golden thread through textile recycling? (2026) LINK	This policy brief gives an overview of the most pressing practical challenges facing these actors and provides actionable policy recommendations.
ARTICLE	My Product Passport	Textile Strategy and DPP: Fashion Industry Compliance (2026) LINK	Discusses EU objectives like increasing recycled fibers, tackling hazardous substances, and enabling circular models via DPP data for recycling and resale.
ARTICLE	KPMG	Digital Product Passport (DPP) (2026) LINK	information on DDP, sectors to be covered, implementation guidelines, etc.
ARTICLE	GS1 in Europe	Digital Product Passport Powered by GS1 Standards (2025) LINK	Relevant information about DPP, regulation, steps of implementation, etc.
ARTICLE	Politecnico di Milano and National Interuniversity Consortium of Materials Science and Technology (INSTM), Italy	Textile Materials Information for Digital Product Passport Implementation in the Textile and Clothing Ecosystem: A Review on the Role of Raw Fibers in a Substantial Transition (2025) LINK	This paper reviews 53 studies on digital product passports, identifying key material data needed to improve sustainability and reduce waste in the textiles sector.

ARTICLE	PESCO-UP partners	Digital product passports: The golden thread through textile recycling? (2024) LINK	PESCO-UP policy brief aims to contribute timely evidence to the ongoing debate on traceability and transparency in the textiles sector. This comes at a critical moment when the Delegated Act for Textiles under the Ecodesign for Sustainable Products Regulation (ESPR) is still under preparation.
STUDY	European Parliament Research Service	Digital Product Passport for the Textile Sector (2024) LINK	This STOA study explores a potential EU DPP for textiles, proposing a three-phase deployment (minimal DPP by 2027, advanced by 2030, full circular by 2033) to boost traceability, reduce waste, and enhance circularity across the value chain.
ARTICLE	GS1 in Europe	The New EU Sustainability Textile Strategy (2023) LINK	Details DPP requirements under the EU Green Deal, noting textiles as a priority sector with mandatory data on lifecycle from raw materials to recycling by 2030, applicable to all EU market products including imports.

Table 14 - DIGITAL PRODUCT PASSAPORT - Projects and initiatives

PROJECTS, INITIATIVES			
TYPE	ACRONYM	TITLE (YEAR) LINK	BRIEF SUMMARY
PROJECT	LIFE-DPP	Digital Product Passport for TEXtile circularity and traceability (2026 - 2028)	LIFE DPP-TEX project utilize DPPs to improve circularity and traceability through two pilot programs in Bulgaria and Spain, the project will recycle and upcycle home textiles and municipal uniforms.
PROJECT	CIRPASS e CIRPASS-2	Digital Product Passport (2022 - 2024 and (2024 -2027) LINK	CIRPASS and CIRPASS2 are European initiatives driving the transition to a circular economy through the development and large-scale deployment of Digital Product Passports across key value chains.
PROJECT	Data to Business	Data to Business (2024 - 2027) LINK	This project implements a data-driven framework to enhance traceability and transparency, promoting circularity, resource efficiency, and reduced environmental impact in the industry.
PROJECT	Be@t	Bioeconomy at Textiles (2022 - 2026) LINK	A project that brings together over 50 entities to promote circularity, bio-based materials, and digital innovation, including the integration of Digital Product

			Passports to enhance traceability and transparency in the textile value chain.
PROJECT	TEX4.0	Enabling Industry 4.0 Skills in Textile SMEs (2022 – 2025) LINK	Digital transformation project advancing Industry 4.0 technologies in ÖKS region's textile sector for smart, sustainable manufacturing and circular processes.
PROJECT	Trace4Value	Traceability for Sustainable Value Chains (2022 – 2024) LINK	An European collaboration that developed and tested digital traceability solutions, including Digital Product Passport concepts, to improve transparency, data sharing, and circularity in value chains such as textiles.
PROJECT	Texp@ct	Innovation Pact for Textile Digitalization (2021 -2025) LINK	The TEXP@CT project in Portugal (running from 2021 to 2025) promotes the digital and sustainable transformation of the textile and clothing sector by integrating advanced technologies, including Digital Product Passports, to improve traceability, resource efficiency, and circularity across the value chain.

Table 15 - DIGITAL PRODUCT PASSAPORT - Tools and platforms

TOOLS, PLATFORMS			
TYPE	TITLE (YEAR) LINK	AUTHOR	BRIEF SUMMARY
TOOL	GS1 Standards enabling the EU digital product passport - **Empowering industry´s circular** transformation and green product choices for consumers LINK	GS1 in Europe	This paper outlines how GS1 standards facilitate Digital Product Passport (DPP) implementation, emphasizing the benefits of ISO/IEC 15459-compliant identifiers, the principles of GS1 data sharing, and the strategic transition to 2D barcodes to meet 2027 regulatory and supply chain requirements
PLATFORM	Digital Product Passport Powered by GS1 Standards LINK	GS1 in Europe	Provides a variety of information, publications, tools and news about the DPP.

Table 16 - DIGITAL PRODUCT PASSAPORT - Training, activities and entities

TRAINING (activities and entities)			
TYPE	TITLE LINK	INSTITUTION	MORE INFORMATION
ONLINE TRAINING	Online Module on Digital Product Passport in Textiles LINK	TEX4.0 project	This course is designed to teach how the European Union's Digital Product Passport (DPP) initiative enhances product transparency, sustainability, and compliance in the modern economy.
WEBINAR	DPP - Unlocking Transparency, Trust, Sustainability, and Circular Value LINK	TEX-BREIN Project	TEX-BREIN Webinar on February 11, 2026, delved into Digital Product Passports (DPP) to unlock transparency, trust, sustainability, and circular value in textiles.

Some of the training courses identified under other topics in this guide may also cover aspects relating to the DPP.

8. EXTENDED PRODUCER RESPONSIBILITY - EPR

8.1 INTRODUCTION

Extended Producer Responsibility (EPR) is an EU-mandated scheme holding textile producers financially and operationally accountable for their products' full lifecycle—from design to end-of-life collection, recycling, and disposal—via eco-modulation fees, collection targets (15% by 2025, 25% by 2030), and Digital Product Passport (DPP) integration.

SMEs face acute challenges like disproportionate financial strain from fees (€0.12-0.20/kg), administrative burdens in multi-country PRO registrations/reporting, supply chain data gaps, material/design shifts to recyclables, and competitive disadvantages versus larger brands, despite a 12-month compliance extension to 2028.

This guide is essential, presenting reports, articles (compliance strategies), regulations, projects, initiatives, tools and platforms, training, and organizations — equipping SMEs with practical skills for registration, data tracking, cost optimization, and sustainable growth.

8.2 WHY EXTENDED PRODUCER RESPONSIBILITY IS IMPORTANT FOR SMES AND STAKEHOLDERS' ECOSYSTEM IN TEXTIL CIRCULARITY?

Extended Producer Responsibility (EPR) is a key policy instrument for advancing textile circularity because it shifts the responsibility for end-of-life management from municipalities to producers. For SMEs, EPR can initially appear challenging due to administrative requirements and potential financial contributions. However, it also creates incentives for eco-design, material efficiency, and innovation, enabling SMEs to align with emerging EU regulations and access circular economy markets. By integrating EPR schemes with tools such as Digital Product Passports, SMEs can improve product traceability and demonstrate compliance more easily.

For broader stakeholders – including recyclers, waste managers, policymakers, and consumers – EPR strengthens coordination across the value chain. It ensures more consistent funding for textile collection and recycling systems, improves data availability on material flows, and supports the development of secondary raw material markets. Overall, EPR is crucial for enabling a structured transition toward a more circular and transparent textile sector, where environmental responsibility is embedded across all stages of production and consumption.

8.3 CONTENTS

This section lists a couple of places where you can learn more about EXTENDED PRODUCER RESPNSABILITY. *Table 17* presents reports, articles and regulations, *Table 18* present projects and initiatives. The *Table 19* provides some Tools and Platforms, and the main training courses and organisations offering training in these areas are presented at *Table 20*.

Given that this topic is closely linked to circularity, the information on circularity is also recommended for consultation (4. CIRCULAR ECONOMY - the case of textiles).

Table 17 - EXTENDED PRODUCER RESPONSABILITY - Reports, articles and regulations

REPORTS, ARTICLES AND REGULATIONS			
TYPE	AUTHOR	TITLE (YEAR) LINK	BRIEF SUMMARY
GUIDE	ForSURE	EPR Reporting: Your Complete Guide (2026) LINK EPR Textile Unraveled: From Thread to Trend (2026) LINK	Guide to help on Reporting EPR, and information's about EPR on different sectors and how to implement it.
ARTICLE	TRUSTRACE	Extended Producer Responsibility (EPR) for Textiles Explained (2025) LINK	This article breaks down EPR rules for textiles, making fashion brands responsible for collecting and recycling discarded clothes to cut waste.
REPORT	European Circular Economy Stakeholder Platform	EPR Schemes - Current state and recommendations for improvement (2025) LINK	This report explains how EPR schemes work and recommends ways to improve them so producers take greater responsibility for product waste and recycling.

ARTICLE	OECD - Organisation for Economic Co-operation and Development	Extended producer responsibility in the garments sector (2024) LINK	The article examines the environmental impacts of garments and evaluates how extended producer responsibility (EPR) can support circular economy goals by improving collection systems and reshaping incentives across the product lifecycle.
ARTICLE	OECD - Organisation for Economic Co-operation and Development	Extended Producer Responsibility Basic facts and key principles - policy perspectives (2024) LINK	Outlines the core concepts, impacts, and design principles of EPR, highlighting how shifting responsibility to producers improves waste collection, recycling performance, and incentives for more sustainable product design across the lifecycle.
ARTICLE	OECD - Organisation for Economic Co-operation and Development	Extended producer responsibility and economic instruments (2024) LINK	Explains how extended producer responsibility (EPR) and other economic instruments are used as policy tools to shift waste management responsibility to producers, generate funding for recycling, and incentivize more sustainable product design and circular economy practices.

ARTICLE	Technical University of Denmark and Environmental and Social Sustainability, Novo Nordisk A/S, Denmark	Designing and operationalising extended producer responsibility under the EU Green Deal (2024) LINK	The article examines how Extended Producer Responsibility (EPR) schemes can be structured and implemented to support the EU Green Deal, focusing on making producers financially and operationally responsible for the full life cycle of products—especially in sectors like textiles and packaging—to improve waste management, increase recycling rates, and drive circular economy practices.
REPORT	EXPRA	Integrate Extended Producer Responsibility within the International plastics Treaty (2022) LINK	The report explains how extended producer responsibility for packaging waste operates in Portugal, highlighting its role in financing recycling systems and helping achieve circular economy and recycling targets.

Table 18 - EXTENDED PRODUCER RESPONSABILITY - Projects and initiatives

PROJECTS, INITIATIVES			
TYPE	ACRONYM	TITLE (YEAR) LINK	BRIEF SUMMARY
INITIATIVE	WRAP	**Transforming the World´s Broken Systems** (2026) LINK	Global initiative (funded by the Norwegian Retailers' Environment Fund) aimed at sharing best practices, building capacity, and fostering collaboration to scale EPR systems internationally.
PROJECT	CIRCULATEX	Fostering circularity in the textile sector: innovative interoperable solutions and best practices for implementation and harmonization of EPR schemes (2025 - 2028) WEBSITE	Circula-TEX is a Horizon Europe project that aims to support the EU strategy for Sustainability and Circular Textiles. The project seeks to redesign textile value chains by developing circular economy strategies aligned with Extended Producer Responsibility (EPR) policies.
PROJECT	Circula-TEX	Fostering circularity in Textile: Innovative Interoperable solutions and best practices for implementation and harmonization of EPR Schemes (2025 - 2028) LINK	The EU-funded Circula-TEX project will support the EU Strategy for Sustainable and Circular Textiles by redesigning textile value chains with a circular approach and ensuring compliance with extended

			producer responsibility (EPR) schemes and EU directives.
PROJECT	CIRPASS 2	S**tands for "Digital Product Passports Enabling At**-Scale and Real-Life Circular Economy Use Cases in electronics, textiles, tyres and construction value chains (2024 - 2027) LINK	CIRPASS-2 is a European project that develops and tests Digital Product Passports to support circular economy practices across electronics, textiles, tyres, and construction value chains.
PROJECT	TRUSTEX	Advanced Sustainable Textiles in the Circular Economy through Innovative EPR Schemes (2025 - 2027) LINK	Represent a pivotal opportunity for the European Union to implement circular business models and solidify its position as a global sustainability leader within the textile industry.
PROJECT	PPS-Pass	Methods and Tools Supporting Digital Product Service System Passpor (2024 - 2027) LINK	PSS-Pass develops a Digital Product Service System Passport that combines product and service lifecycle data to help manufacturing companies improve circularity, environmental decision-making, and product-service management. It will be tested in home appliances, complex equipment, and textiles.

Table 19 - EXTENDED PRODUCER RESPONSABILITY - Tools and platforms

TOOLS, PLATFORMS			
TYPE	TITLE (YEAR) LINK	AUTHOR	BRIEF SUMMARY
TOOLS	Circular Pro (RecycleMe) LINK	Recycle.Me	End-to-end EU service for registration, data management, reporting, legal monitoring, and audits.
TOOLS	European Recycling Platform LINK	ERP Global	Multi-country compliance service across 40+ PROs in Europe (e.g., Austria, Germany, Italy, Portugal, Spain, UK) for WEEE, batteries, and packaging.
PLATFORM	Textile ETP LINK	European Technology Platform for the Future of Textiles and Clothing (Textile ETP)	Textile ETP is a European Technology Platform that brings together industry, research, and policymakers to drive innovation, sustainability, and competitiveness in the textile and clothing sector.
PLATFORM	CircularData LINK	CIRPASS-2 project	Is a networking tool for organisations involved in the Digital Circular Economy, review Digital Product Passport (DPP) use cases and access DPP - related services.

Table 20 - EXTENDED PRODUCER RESPONSABILITY - Training, activities and entities

TRAINING (activities and entities)			
TYPE	TITLE LINK	INSTITUTION	MORE INFORMATION
TRAINING	Deep dive into the Extended Producer Responsibility (EPR) principle for e-waste management LINK	ITU Academy, Switzerland	6-module course on EPR fundamentals, stakeholder roles, financial mechanisms, and system-building (80% pass for badge).
TRAINING	Compliance made simple LINK	EPRACADEMY	Is a self-paced online training platform designed for businesses and compliance managers to master Extended Producer Responsibility (EPR) for packaging.
TRAINING	EPR Training Courses LINK	BRUKER	Bruker BioSpin offers a comprehensive range of EPR training courses. We provide introductory classes as well as courses for advanced operators.
WEBINAR	Regulatory Compliance and Certification in the Textile Industry LINK	TEX-BREIN Project	TEX-BREIN Webinar on March 19, 2026, recapped regulatory compliance and certification strategies for advancing sustainability in the textile industry.
WEBINAR	Extended Producer Responsibility (EPR) - Guidelines for the Textile Sector LINK	TEX-BREIN project	TEX-BREIN Webinar on November 24, 2025, unpacked the new EU Extended Producer Responsibility directive to boost circular innovation in textile ecosystems.

Some of the training courses identified under other topics in this guide may also cover aspects relating to the EPR.

9. CONCLUSION

This document presents a tool to facilitate access to information on Circular Textiles, with a particular focus on certain topics identified by the companies that took part in the survey, as well as by the experienced partners of the TEX-BREIN project.

It is important to emphasise that most of the references, although listed under a specific area, may also contain relevant information from other areas directly related to circularity in the textile sector.

It is recommended to keep up to date with the main websites and platforms, such as those of the European Commission, national and regional authorities, as well as the clusters and partners in each country/specialist area.

The TEX-BREIN project website has videos and materials available of the various webinars held on these topics, LINK.

Below are the project partners and their respective websites, where relevant information on these areas can be found:

CLUTEX – Klastr Technické Textile (Czechia) - LINK

NTT – Next Tecnology Tecnotessile Societa Nazionale Di Ricerca R L (Italy) - LINK

PRODUTECH - Associação para as Tecnologias de Produção Sustentavel(Portugal) - LINK

CIRI - Centrum Investic Rozvoje A Inovaci (Czechia) - LINK

CITEVE - **Centro Tecnológico das Industrias Têxtil e do Vestuário de Portugal** - LINK and Portuguese Textile Cluster (Portugal) - LINK

Tèxtils.CAT – Associacio Agrupacio D'Empreses Innovadores Textils (Spain) - LINK

PIOT – Zwiazek Pracodawcow Przemyslu Odziezowego I Tekstylnego (Poland) - LINK

UB – Hoegskolan I Boras – SCIENCE PARK BORAS (Sweden) - LINK