D2.3 Training material course curricula

Interregional Innovation Investments Instrument (I3)

Deliverable due date: 31-12-2024 (M24)

Dissemination Level: Public (PU)

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EXECUTIVE SUMMARY

The primary objective of Work Package 2 (WP) in the RegioGreenTex project is to establish a dynamic textile recycling ecosystem across Europe. A key element of this goal is the development of training materials under Task 2.3. This task focuses on organizing and evaluating existing digital training resources, identifying knowledge gaps, and supplementing them with new content as necessary. These training packages will address the learning needs of professionals in the textile sector and help close critical knowledge gaps, ultimately being integrated into the RegioGreenTex Digital Tool in 2025.

The approach of this task involves three phases: first, consultations with partners in WP 1, 3, and 4 to identify key knowledge gaps among SMEs; second, the refinement of these categories with partner feedback; and third, the creation of a development plan to address the uncovered topics. The training materials, categorized into several areas, will be publicly available and include formats such as RegioGreenTex Community Talks, websites, knowledge clips, and MOOCs.

The knowledge gaps identified across various work packages include crucial topics like eco-design, EU regulations, circular business models, and recycling. Specific challenges include the legal status of waste, Life Cycle Assessment (LCA), new business models, and recycling certification methods. Additionally, WP4 highlights the need for practical examples and best practices in areas like AI in textiles.

Several key categories for training have been identified, including textile value chains, sustainable design, production, consumer behaviour, end-of-life options, and recycling. The textile industry is shifting towards circular and bio-based models, yet challenges remain in terms of raw material sourcing, waste management, and technology integration. Notably, end-of-life recycling and the regulatory landscape continue to evolve, with gaps in certification schemes and waste management policies across the EU.

Overall, the development of accessible, engaging, and comprehensive training materials will play a vital role in advancing the textile sector's sustainability and circularity efforts, ensuring a smoother transition towards more sustainable practices across the industry.

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1   INTRODUCTION

1.1 Training material on green textiles and design for circularity (task 2.3)

The primary objective of WP2 is to establish a dynamic textile recycling ecosystem at the European level, including the development of training materials as part of Task 2.3. This task focuses on gathering and organizing existing digital training resources, aligning them with the knowledge gaps identified in this project, and supplementing them with any missing elements. The aim is to meet the learning needs of professionals and address critical knowledge gaps. These training packages will be integrated into the RegioGreenTex Digital Platform in the project's final year.

1.2 Approach

- Step one involved discussions with partners in the RegioGreenTex project, specifically the work package leaders from WP1, WP3, and WP4, to identify knowledge gaps among SMEs.

- Step two focused on further detailing the identified categories (as outlined in this deliverable) and sharing them with RegioGreenTex partners for feedback.

- Step three entailed analysing the input received, identifying topics that remain uncovered, and creating a plan to develop the necessary materials over the next year.

1.3 Structure of this deliverable

This deliverable is divided into two parts. The first part provides background information on the categories identified as relevant or considered knowledge gaps by REGIOGREENTEX partners. The training materials are included in the appendix, organized according to the described categories. Given the abundance of existing information and the expertise within the REGIOGREENTEX consortium, the main challenge of this task lies in selecting accessible, publicly available resources suitable for a broad audience. While scientific publications are referenced, they are less ideal since not all companies have access to such literature.

The digital, publicly available training materials compiled in the appendix will take the following forms (the complete list of training materials developed in this task will be available in the Deliverable 7.4 Final Progress Report):

- RegioGreenTex Community Talks or Going Green Training: Publicly available materials generated within the RegioGreenTex project, including examples and good practices.

- Websites: Reliable sources of information on specific topics, such as updates on new EU legislation.

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- Knowledge Clips: Short, focused videos (5–7 minutes) that explain specific topics in an engaging way.

- Other Formats: Includes podcasts and MOOCs (Massive Open Online Courses).

2   CATEGORIES IDENTIFIED

2.1 RegioGreenTex gaps identified

From WP1, including the gap analysis and value chain mapping (led by Centexbel) and Deliverable 1.3: *Mapping and Gap Analysis*, it became evident that there is a significant lack of knowledge regarding eco-design, evolving EU regulations, and circular business models. These topics have been flagged as critical knowledge gaps. However, other issues mentioned—such as the shortage of skilled workers or challenges in identifying local partners—are beyond the scope of this task.

WP3 Implementation Portfolio of Investment Projects (led by CITEVE) focuses on executing pilot actions through various SMEs involved in the project. The goal is to accelerate the development of new textile materials with increased recycled content within the REGIOGREENTEX SMEs.

Conducting a general gap analysis for WP3 is challenging, as the technical issues in the pilots are often highly specific and detailed. However, common ground was found in the following challenges, all of which are identified as knowledge gaps in this task:

- Legal status of waste

- Life Cycle Assessment (LCA)

- New business models

- Understanding and adopting recycling certification methods

- Supply and demand; the formation of new value chains

- Regulatory barriers, issues, and ambiguities

WP4 Advisory Services and Support to the Portfolio of SME Projects (led by Next Technology Tecnotessile - NTT) aims to support the success of SMEs by monitoring innovation and market impact, while connecting innovative SMEs across different regions. WP4 offers advisory and support to help companies increase their Technology Readiness Level (TRL) and define a go to market and exploitation strategy.

The gap analysis for WP4 addresses similar topics to those in WP3, including the use of AI in textiles. There is a need for strong examples and best practices, rather than focusing on highly individualized topics.

The following paragraphs outline the five main categories identified during step 3: textile value chains (in general), design, production, consumers and end-of-life options, and recycling.

2.2 Textile value chains

2.2.1 Three different value chains

Textile production is a global industry, and the supply chain – covering raw materials production to finished garments - is complex, fragmented, and interconnected. A wide range of techniques are used to transform raw materials into textiles and, ultimately, products. Before yarn is produced, numerous steps have already been taken to turn raw materials into fibres that can be spun into yarn.

Most textile fibres are made of carbon-based polymers, long-chain molecules that form the basis of many materials and living tissues. These polymers are created by linking small molecules (monomers) together through a chemical synthesis reaction known as polymerization. When this chemical process occurs in living organisms, the resulting fibres are called natural or semi-synthetic. When it occurs in a chemical factory, the fibres are known as synthetic.

The textile industry is generally divided into three main value chains, each producing a different type of fibre: natural fibres, semi-synthetic fibres, and synthetic fibres. Each value chain has its own dynamics, challenges, and recycling possibilities. At a certain point, these separate value chains converge in fabric production, which is often where the finishing process also takes place.

The three value chains are as follows:

- **Natural fibres**: These are bio-based fibres of biological origin, primarily produced by animals and plants. The fibres are harvested by farmers who grow fibre crops or breed animals for their hair. Examples include cotton, flax, hemp, and wool.

- **Semi-synthetic fibres**: These are man-made fibres derived from bio-based polymers, produced from animals, plants, or microorganisms. They are often based on cellulose and are referred to as Man-Made Cellulosic Fibers (MMCFs). The polymers are produced from bio-based resources such as wood or bamboo. Examples include viscose, lyocell, and cupro.

- **Synthetic fibres**: These are man-made fibres derived from either fossil or bio-based monomers. The monomers are produced by the chemical industry, with resources primarily

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coming from fossil fuels, though bio-based options are also available. Examples include polyester, polyamides, and elastane.

➢ More information can be found in Appendix 1.

2.2.2 Sustainability

The United Nations defines sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." It rests on three pillars: environmental, social, and economic.[1] But what does sustainability mean for the textile sector? Developing a shared understanding of key concepts — such as circularity, sustainability, and environmental issues — is essential. Clarifying the meaning of these terms is crucial for promoting mutual understanding and driving systemic change within the industry.

➢ More information can be found in Appendix 1, including a MOOC on Sustainability in the textile sector.

2.2.3 Common language, terminology, taxonomy

The textile and clothing sector is rich in its vocabulary to describe all stages in the manufacturing process. However, the textile industry is in transition to become more sustainable and circular, and novel processes and new materials become part of the value chain. A common language or terminology is needed to support this transition. Within RegioGreenTex, a task was dedicated to work on this issue. As a result, a Taxonomy was developed (see Deliverable 1.1) which will feed into the digital tool.

➢ Existing training material is limited (see Appendix 1) and needs more attention. Challenge is the wide scope of this topic.

2.3 Design

2.3.1 Ecodesign

Within the EU, the policy and regulatory landscape for textiles is undergoing significant changes. New policies and upcoming regulations are reshaping how textile products are made, sold, and consumed in the EU. One key regulation is the Ecodesign for Sustainable Products Regulation (ESPR)[2], which came into force on July 18, 2024. The ESPR aims to substantially improve the circularity, energy performance, and other environmental sustainability aspects of products placed

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[1] https://www.un.org/en/academic-impact/sustainability

[2] https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/ecodesign-sustainable-products-regulation_en

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on the EU market, including textiles. A key component of this is the Strategy for Sustainable and Circular Textiles[3], launched in 2022. Key elements of this strategy include:

- Binding ecodesign requirements, including durability, repairability, and recycled fibre content

- Measures to stop microplastic pollution

- Actions to tackle fast fashion, textile waste, and the destruction of unsold products

- Enforcement of accurate green claims

- Promotion of sustainable global value chains

➢ Material is available in the form of websites from the EU (see Appendix 2), but more RegioGreenTex dedicated material with good practices or cases as examples is desired.

2.3.2 Sustainable design approaches

In seeking to reduce the impact of the textile industry, designers are looking into different approaches and perspectives. Some designers believe in taking a step back to look at nature as a possible solution, while others assume advanced technology is the way to decrease production and consumption in the textile industry.

➢ More information can be found in Appendix 2.

2.4 Production

The production process in the textile industry is a multi-step, complex system that transforms raw materials into finished products for a wide range of uses. It involves a variety of stages, each essential to the creation of textiles, from raw fibre processing to the final fabric or garment.

2.4.1 Raw materials

Raw materials for textiles include fibers, polymers, chemicals, dyes, and various auxiliaries. Some of these materials are sourced from more localized bio-based resources, but the majority come from fossil resources, linking the textile industry to the global fossil and chemical sectors.

Within the EU, there is a shift toward a Bioeconomy, which encompasses all sectors and services involved in the production, use, processing, distribution, and consumption of biological resources. One of the Bioeconomy's main objectives is to reduce dependence on non-renewable, unsustainable resources. In this system, fossil resources are phased out, as is already happening in the energy sector. In parallel, the Circular Economy promotes an economic model that prioritizes

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[3] https://environment.ec.europa.eu/strategy/textiles-strategy_en

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reducing, reusing, recycling, and recovering materials throughout production and consumption processes, replacing the traditional linear approach.

The transitions in the textile sector are part of both the Circular Economy and the Bioeconomy. Textile production uses both fossil-based and bio-based resources. Circularity strategies applied to fossil-based and bio-based textiles contribute to the Circular Economy, while an increased use of bio-based resources aligns with the Bioeconomy. However, the textile industry, with its complexity and diversity, may be less aware of the origin of the raw materials it uses, and the challenges associated with them. Often, the focus is more on the transition from a linear to a circular economy than on the shift toward a Bioeconomy.

The issue of raw materials in circularity is particularly challenging. As raw materials evolve, production methods must also adapt, and new technologies are continuously being developed.

➢ More information can be found in Appendix 3.

2.3.2 Circular business models

As the textile industry faces increasing pressure to reduce its environmental impact, circular business models have emerged as a transformative approach to achieving sustainability. Unlike traditional linear business models, which follow a "take-make-dispose" path, circular models focus on maintaining the value of products, materials, and resources in the economy for as long as possible. In the context of textiles, circular business models aim to reduce waste, extend the life cycle of materials, and create closed-loop systems that minimize the need for new resources.

➢ More information can be found in Appendix 3.

2.4 Consumers

Consumers play a crucial role in the textile industry, as their preferences and behaviours directly influence production, innovation, and sustainability efforts. In recent years, the impact of consumer choices on the industry has become more pronounced, with growing awareness about the environmental and social implications of textile production and consumption. As a result, the role of consumers is evolving, moving from passive buyers to active participants in the push for sustainability and ethical practices in fashion.

Consumers are not yet fully prepared for the Circular Economy. Consumer behaviour is a key factor in the Refuse strategy. They can make a significant contribution to this strategy without impacting their standard of living, through simple actions such as avoiding unnecessary products or extending

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the lifespan of items during the usage phase (Bartl, 2011). Additionally, when textiles are discarded after use, consumers play an active role in the Recycling strategy, as they are the primary source of post-consumer textiles.

➢ More information can be found in Appendix 4.

2.5 End of Life and recycling

End-of-life (EOL) recycling in the textile industry is an essential component of the circular economy, aimed at reducing waste, conserving resources, and minimizing environmental impact. As the textile industry continues to face increasing pressure to become more sustainable, improving recycling processes and systems for textiles at their end-of-life stage has become a critical focus. End-of-life recycling involves reprocessing garments and textiles that are no longer in use, diverting them from landfills, and transforming them into new materials or products.

2.5.1 Law and legislation

The European textile sector is committed to become more sustainable and resilient. The policy and regulatory landscape for the textile industry is evolving quite fast, and not only in the field of eco-design, but also in the use phase and end-of-life phase. This is clearly a RegioGreenTex gap, also defined by gap analysis in WP1:

• No standards for recycled products

• Lack of certification schemes

• Policies applied consistently across EU (waste management)

➢ Available knowledge is very limited (see Appendix 5) and more dedicated RegioGreenTex-input is required.

2.5.2 Collection and sorting

Collecting and sorting are fundamental steps in the textile recycling process. They are crucial to ensuring that textile waste is effectively diverted from landfills and reused in a sustainable manner. These stages, though often overlooked, play a significant role in determining the quality of recycled products and the efficiency of recycling systems. Proper collection and sorting ensure that textiles are processed in a way that maximizes resource recovery and minimizes contamination, allowing for higher rates of material reuse and recycling.

➢ For this topic, there is a strong connection with other work in RegioGreenTex. With the build of the "Waste Solution Finder" on the RegioGreenTex Digital Tool and the "Textile Waste

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Channelling Guide" as a handbook (available in 2025), this topic is well covered within RegioGreenTex.

2.5.3 Recycling techniques

Recycling techniques in the textile industry are critical to transforming waste into valuable resources, reducing the environmental impact of textile production, and promoting sustainability within the fashion sector. With the global textile industry generating millions of tons of waste annually, recycling methods are essential for extending the life of materials, conserving natural resources, and minimizing landfill waste. As the demand for more sustainable fashion grows, several innovative recycling techniques are being developed to address these challenges and create a circular textile economy.

Currently, there is no universally accepted definition of textile recycling technologies, and given the complexity of the topic, it is unlikely that a single standard definition will emerge. Many scientific publications refer to processes using terms such as mechanical, physical, chemical, thermal, or combinations of these. However, clearly distinguishing between these processes is challenging, as changes to materials are often driven by a combination of mechanical, chemical, and physical actions.

As a general guideline, natural fibres are primarily recycled through mechanical methods, semi-synthetic fibres are mainly recycled by physical methods (such as melting or dissolving, where no chemical reactions occur), and synthetic fibres are typically recycled through chemical methods (where materials are broken down to their monomeric level), but also mechanical or physical methods are possible.
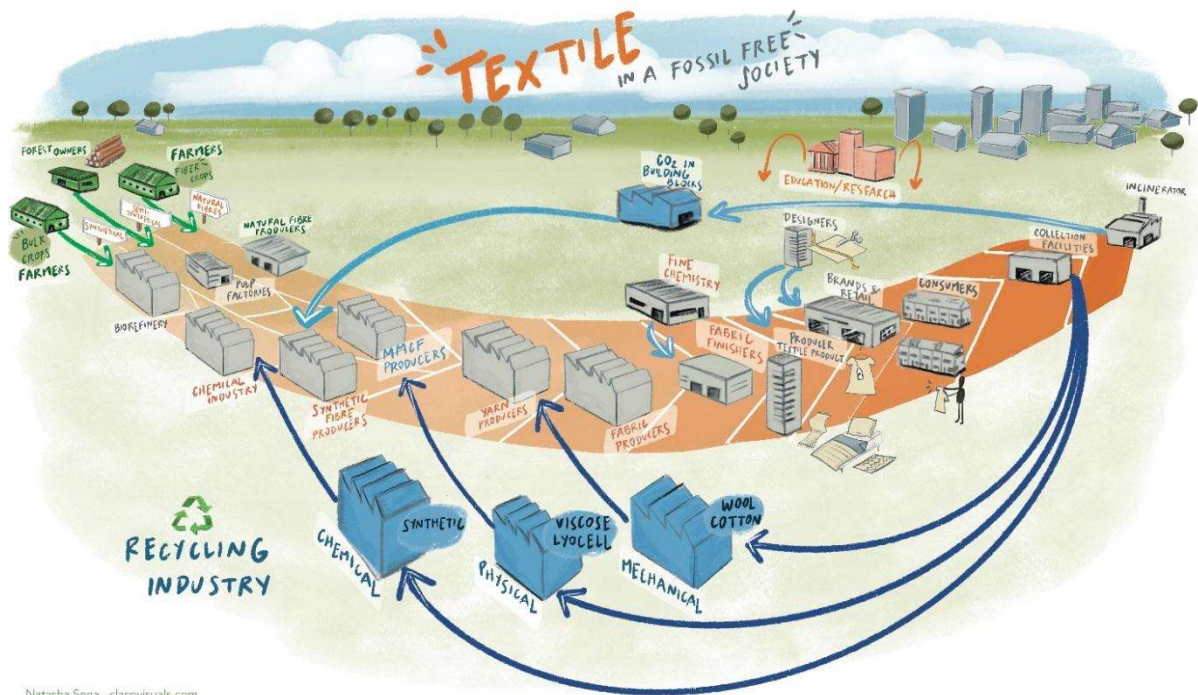
Schematic presentation of the three different value chains to produce textiles, combined with recycling options. WUR, drawn by Natasha Sena.

➢ There is no lack of information on textile recycling techniques, but the challenge is that specific value chains (and thus companies) face specific challenges, although there are similarities. Also, non-technical challenges such as lack of volumes and storage occur. Coaching sessions organised in WP4 provide adequate resources to cover specific questions raised by the SMEs.

3   SUMMARY

The main goal of WP2 is to create a dynamic textile recycling ecosystem at the European level, including the development of training materials (Task 2.3). The task focuses on gathering, organizing, and supplementing existing digital training resources to address knowledge gaps in the textile sector. These resources will be integrated into the RegioGreenTex Digital Tool powered by Ariadne Innovation next year.

The textile sector is undergoing a transition to become more sustainable and circular, with significant challenges in areas such as raw materials, design, recycling, and consumer behaviour. Addressing these gaps through training and innovation is key to achieving a more sustainable textile industry.

Next steps: Having gained a better understanding of the knowledge gaps and the existing training materials, the next step is to prioritize the topics that are most important to the partners. It is crucial to identify which areas require further development of new training materials.

Additionally, the form of delivery for the training materials must be considered, as there are numerous options available. These could include knowledge clips, webinars, or even live masterclasses or seminars.

To gather more insights on the most urgent topics and preferred formats, an online survey will be developed beginning of next year. This survey will help determine the top three topics that require attention, as well as the preferred delivery methods. Based on the results, the training initiatives will be organized in 2025.

4 REFERENCES

[1]   D. de Wagenaar, J. Galama, and S. J. Sijtsema, "Exploring Worldwide Wardrobes to Support Reuse in Consumers' Clothing Systems," *Sustainability*, vol. 14, no. 1, Jan. 2022, doi: 10.3390/su14010487.

[2]   P. Harmsen, M. Scheffer, and H. Bos, "Textiles for Circular Fashion: The Logic behind Recycling Options," *Sustainability*, vol. 13, no. 9714, 2021, doi: 10.3390/su13179714.

APPENDICES: TRAINING MATERIAL

Appendix 1: Textile value chains

Three different value chains

- **Podcast**: *Globalization and Textile Value Chains*, by Michiel Scheffer, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191070209/

- **Knowledge clip**: *Transition theory*, by Barbara van Mierlo, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191266827/

- **Knowledge clip**: *Local communities in textile value chains,* by Stijntje Jaspers, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191135823/

- **Booklet**: P. Harmsen, H. Bos, "Textiles for Circular Fashion. Part 1: Fibre Resources and Recycling options", Wageningen University and Research, Wageningen, 2020, https://edepot.wur.nl/517183

- **Booklet**: P. Harmsen, W. Post, and H. Bos, "Textiles for Circular Fashion. Part 2: From renewable carbon to fibres," Wageningen University and Research, Wageningen, 2022, https://edepot.wur.nl/568425

Sustainability

- **Webinar**: Peñaloza, P. (2024). Exploring environmental metrics (LCA, EPD, PEF). *RegioGreenTex Going Green Trainings [Webinar]*. Retrieved from https://www.youtube.com/watch?v=TUYrvksbUgo

- **MOOC** Factive: the FACTIVE Massive Open Online Course (MOOC) aims to analyse the textile and clothing industry from a sustainability point of view, with a particular focus on the new processes, business models and technologies that can be used for an improvement of the environmental impact of the T&C sector. Provided by Circular Textils.cat.

Common language

- **Podcast:** *Building a common language*, D. de Wagenaar, E. Wubben, P. Harmsen, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/190840845

- **RegioGreenTex Taxonomy** (in progress)

- **Report**: Preferred Fibers and Materials: Definitions Initial Guidance, Textile Exchange 2023, https://textileexchange.org/app/uploads/2023/02/Preferred-Fibers-and-Materials-Definitions-Guidance-Jan-2023.pdf

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Appendix 2: Design

Ecodesign

- **Website**: European Commission: https://commission.europa.eu/energy-climate-change-environment/

- **Website**: Eco chain (LCA software company): https://ecochain.com/blog/espr-2024-overview/

- **RegioGreenTex Community talks**: REGIOGREENTEX NE Romania Hub; design for recycling

- **Cases in Flanders** https://vlaanderen-circulair.be/en/cases?form=casesIndexForm&q=ecodesign&provincies=#casesIndexForm

Sustainable design approaches

- **Knowledge clip**: *Different perspectives on design*, by Jeroen van den Eijnde, WUR, 2023 https://wiki.groenkennisnet.nl/space/BMFFT/190971917/

- **Knowledge clip**: *Designing with nature*, by Lianne Toussaint, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191102987/

- **Knowledge clip**: *Circular design*, by Jeroen van den Eijnde, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191397889/

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Appendix 3: Production

Raw materials

- **Webinar**: Shahbazi, S. (2024). Understanding the tools for systemic change (Green Kaizen - Waste Flow Mapping). *RegioGreenTex Going Green Trainings [Webinar]*. Retrieved from https://www.youtube.com/watch?v=pngoW0Y9_Ok

- **Report:** Materials Market Report 2024, textile Exchange, 2024, https://textileexchange.org/knowledge-center/reports/materials-market-report-2024/

- **MOOC:** DESTEX, Promotion of creativity to drive innovation in the manufacturing sector of advanced textile materials, provided by Circular Textiles.cat, https://learn.destexproject.eu/

- **Knowledge clip**: *Fibre production pathways*, P. Harmsen, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191201303/

- **Knowledge clip**: *Biomass Production for Biobased textiles*, S. Jaspers, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/190873931/

- **Booklet**: P. Harmsen, W. Post, and H. Bos, "Textiles for Circular Fashion. Part 2: From renewable carbon to fibres," Wageningen University and Research, Wageningen, 2022, https://edepot.wur.nl/568425

Circular business models

- **MOOC** Factive: the FACTIVE Massive Open Online Course (MOOC) aims to analyse the textile and clothing industry from a sustainability point of view, with a particular focus on the new processes, business models and technologies that can be used for an improvement of the environmental impact of the T&C sector. Provided by Circular Textils.cat.

- **Knowledge clip**: Growth logic, by Dieuwertje de Wagenaar, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/

- **Knowledge clip**: Dematerialisation, by Dieuwertje de Wagenaar, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/

- **Knowledge clips** (4) on R-strategies by Dieuwertje de Wagenaar, WUR, 2023:
    - Refuse (https://wiki.groenkennisnet.nl/space/BMFFT/195231745/)
    - Rethink (https://wiki.groenkennisnet.nl/space/BMFFT/195264513/)
    - Reduce (https://wiki.groenkennisnet.nl/space/BMFFT/195297281/)
    - Reuse (https://wiki.groenkennisnet.nl/space/BMFFT/195297293/),

Appendix 4: Consumers

- **Knowledge clip:** *Consumer Research*, by Arnoud Fisher, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191135745/

- **Knowledge clip**: *User Experience and Emotional Durability*, by Danielle Bruggeman, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191135791/

- **Knowledge clip**: *Behavioural change*, by Siet Sijtsema, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/190971929/

- **Knowledge clip**: *Circular Behaviour in Fashion*, by Siet Sijtsema, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191365131/

- **Knowledge clip**: Dematerialisation, by Dieuwertje de Wagenaar, WUR, 2023, https://wiki.groenkennisnet.nl/space/BMFFT/191201281/

- **Scientific publication**: Exploring worldwide wardrobes to support reuse in consumers clothing systems, D. de Wagenaar, Sustainability, 2022.[1]

Appendix 5: End of life and recycling

Law and legislation

- **RegioGreenTex Community talks**: Understanding upcoming EU legislation.

- **Knowledge clip (to be developed)**: Knowledge clips about law and legislation (WUR)

- **Guide**: Welcome to the world of waste legislation (Wouter Dujardin - OVAM) - in development

Collection and sorting

- **Report**: Edsberger, A., Hanning, A.-C., Marchall, C., Enebog, E., Engström, G., Jensen, L.-M., Brodin, M., & Björquist, S. (2024). *Framework for circular textiles*. Retrieved from https://www.ri.se/sites/default/files/2024-12/RISE_Framework-for-circular-textiles_2.pdf

- **Webinar**: Nauman, F. (2024). Integrating open dataset & AI models for textile sorting. *RegioGreenTex Going Green Trainings [Webinar]*. Retrieved from https://www.youtube.com/watch?v=HRqzJKz0bVw

Recycling techniques

- **REGIOGREENTEX Community talks**: Lowlands Hub; mixed textile waste

- **REGIOGREENTEX Community talks**: REGIOGREENTEX Norte hub; cotton recycling

- **REGIOGREENTEX Community talks**: REGIOGREENTEX Prato Hub; wool recycling

- **REGIOGREENTEX Community talks**: REGIOGREENTEX Rhone-Alpes; synthetics recycling

- **REGIOGREENTEX Community talk #5:** *Taxonomy on textile recycling methods*, P. Harmsen and S. Abdulbawab, WUR, 2024

- **Scientific publication:** *Textiles for circular fashion: the logic behind recycling options*, Harmsen P, Scheffer M, Bos H, Sustainability (2021) 13(9714) [2]

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