

GLOBAL DIMENSION OF TEXTILES

Trainer Handbook



VERDEinMED

Interreg
Euro-MED



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the European Union

PREFACE

This document aims to develop a skilled workforce through knowledge sharing, fostering experienced professionals in the Textile and Clothing Industry with a focus on circular strategies and textile waste management.

It is a key outcome of the VERDEinMED project, specifically Activity 1.3 – Train the Trainers, which is part of WP1: Reforming the Industry through Sustainable and Circular Practices.

This document aligns with the theme “Global Dimension of Textiles”, exploring the industry's interconnectedness and its global impact.

It addresses key trends, challenges, and opportunities shaping the future of textiles on an international scale.

The information is organized by:

1. Overview of the global textile industry;
2. Global supply chain dynamics;
3. Environmental and social implications;
4. Global regulations and standards;
5. Case studies and best practices.



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Overview of the Global Textile Industry

The global textile ecosystem is composed of the textile, clothing, leather and footwear industries, which are among the most globalised value chains. Worldwide, the textile and clothing industry employs millions of people and generates substantial economic value. It is considered one of the largest industrial sectors in Europe. According to Euratex data from 2021, there were 143 thousand companies (67% operating in the clothing sector and 33% in textiles), employing 1.3 million people, with a total turnover of €147 billion. The value of exports amounted to €58 billion, while imports reached €106 billion.

The textile industry faces significant challenges, including water and air pollution, greenhouse gas emissions, and the release of harmful chemicals. Digitalisation is driving improvements in performance and sustainability through the integration of the Internet of Things (IoT), artificial intelligence (AI), data analytics and 3D technologies. To remain competitive, start-ups are emphasising innovative marketing strategies, including immersive fashion experiences, gamification and personalised, user-centric services. Novel fabrics and advanced manufacturing technologies represent other key trends in the textile industry.

To reduce the ecological footprint of the textile industry, it is necessary to implement initiatives that minimise the perceived gap between fast fashion and sustainability. Emerging economic models such as the Circular Economy, Bioeconomy, Blue Economy and Creative Economy may play a decisive role in enhancing the sustainability of the textile industry and, consequently, in supporting the achievement of the Sustainable Development Goals. In 2018, the European Commission defined the Bioeconomy as an economy that uses renewable biological resources from land and sea to produce food, energy and materials.

The Ellen MacArthur Foundation described the Circular Economy as “an industrial system that is restorative or regenerative by design”. More specifically, the Circular Economy applies science, technology and innovation to increase efficiency by designing products for recyclability and re-use at the end of their life cycle, while eliminating waste and pollution from production systems. According to the United Nations, the Blue Economy represents the green economy concept adapted to ocean-based activities, offering potential benefits to Small Island Developing States with extensive marine resources, as well as to developing countries with long coastal areas. The Creative Economy, in turn, encompasses the trade, labour and production of creative industries, supporting sustainable entrepreneurship and empowering innovators, particularly generations that have grown up in the digital era.

Policy makers, industry actors, retailers and consumers are key stakeholders in reducing the negative impact of the textile industry on the global environment. The most significant actions to be undertaken include:

- by policy makers: legislation and regulation, green taxation, and policy tools aimed at achieving better balance and promoting a slower, more sustainable system;
- by industry: preventing waste and overproduction, investing in carbon-neutral and eco-efficient technologies, closing the loop for materials and services, and ensuring supply-chain transparency;
- by retailers: adopting new business models that encourage slower consumption, and implementing pricing systems that reflect the environmental impact of products;
- by consumers: extending product lifespans, practising conscious consumption, and embracing slower consumption patterns.

Global Supply Chain Dynamics

The textile and clothing sector exemplifies the effects of globalisation, as numerous production sites have moved from mature markets in industrialised regions to emerging markets and developing countries. This shift has consequently transformed the structures and material flows within their respective supply chains. The textile supply chain is long and complex, extending from raw materials (upstream) to consumers (downstream), with information flowing both upstream and downstream. Figure 1 represents this textile supply chain in simplified steps.

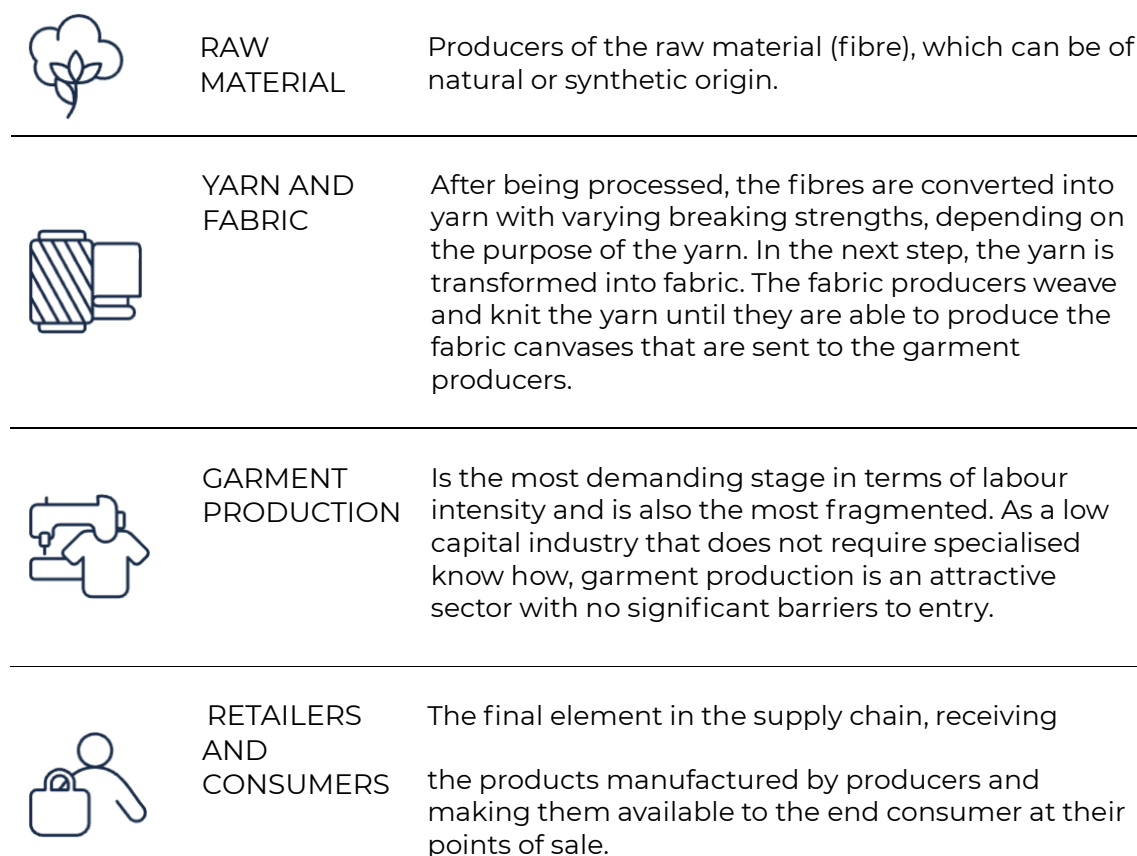


Figure 1 - Textile and clothing sector supply chain.

Dynamics in Textile System

In the textile sector, several stages of the ecosystem need to be reviewed and renewed in order to close the textile cycle. It is therefore necessary to implement changes that lead to a sustainable value chain.

Traceability throughout the entire value chain is a crucial aspect, as it helps to create circular flows. With the support of digital platforms, it is possible to establish common standards that ensure information is comparable and validated.

In order to achieve a circular and source-effective flow in the textile industry, there is a need to redesign products, processes, relationships and business models. This requires innovation across all areas.



INDUSTRIAL SYMBIOSIS

Greater exchange of materials across industries and sectors is essential. Significant material flows and new opportunities must be identified at both industrial and post-consumer levels. This enables beneficial cross-industry partnerships, including between food and environmental sectors. Examples include agricultural and food waste streams, established links with forestry, PET bottles converted into polyester, and materials collected from laundries and public-sector contexts.



TRANSPARENCY & TRACEABILITY

Traceability across the value chain is essential to monitor sustainability and enable circular flows. Communication and traceability support the establishment of common, comparable, and validated standards. Introducing legal requirements for traceability and measurement can increase consumer awareness, improve price transparency, and highlight the value and performance of higher-quality, more sustainable products.



ECO DESIGN & ECOENGINEERING

New strategies are needed to promote sustainable products and uses that enable recirculation and close material loops. Improved tools and support for circular design are required. Clothing and textiles must be designed from the outset for reuse and recycling. Access to up-to-date life cycle assessment data, based on planetary boundaries and ecosystem services, is essential to evaluate full product life cycles.



DIGITALIZATION

Digital technologies enable new business models and support circular practices. Digital tools can help manage wardrobes, extend garment lifespans, facilitate size exchanges within brands, assist colour matching, and support image production and publishing. These technologies enhance user engagement, optimize product use, and contribute to more efficient and sustainable clothing systems.

Figure 2 - Emerging dynamics in textile supply chain.

Environmental and Social Implications

The global textile industry is an intricate network that connects economies, cultures, and lifestyles. From the fibres used to make threads to the clothes worn by people, textiles weave a narrative of prosperity and adversity. However, beneath the fabric's surface lies a tapestry of environmental and social implications that demand our attention and action. This section provides an in-depth examination of the environmental and social issues associated with this industry, focusing on the following areas: environmental footprint, labour practices, and ethical considerations that define the global textile industry.

Environmental Footprint

The resource consumption in the textile industry is a significant environmental concern, impacting water, land, energy, and raw material usage Figure 3.



Highest source of pressure on water and land use in the EU



Highest use of raw materials and greenhouse gas emissions



Largest employer worldwide, after food and housing

Figure 3 - Textiles - European Environment Agency.

In 2020, the textile industry was the third-largest contributor to water degradation and land use. During that period, it required an average of nine cubic metres of water, 400 square metres of land, and 391 kilograms of raw materials to supply clothing and footwear for each citizen of the European Union.

WATER CONSUMPTION

The textile industry has a significant impact on global water resources, accounting for around 10% of global water consumption. Key processes such as washing, dyeing, and finishing require large amounts of water to cleanse fabrics, apply dyes and finishes, and achieve the desired textures and appearances. This heavy reliance on water often results in substantial wastewater discharge containing chemicals, dyes, and pollutants, posing serious environmental challenges, particularly in regions facing water scarcity.

Key Points:

- High Water Usage: Essential in washing, dyeing, and finishing processes;
- Wastewater Discharge: Often contains harmful chemicals and pollutants;
- Environmental Impact: Especially problematic in water scarce regions.

Efforts to reduce water consumption and enhance wastewater treatment are essential to minimize the environmental footprint of the textile industry and promote sustainability.

ENERGY CONSUMPTION

The textile industry consumes a significant amount of energy throughout its production cycle, from manufacturing to transportation. Energy is essential for operating machinery in processes such as spinning, weaving, and knitting. The production of yarn and fabric accounts for 40–45% of total energy use, while wet processing units consume 35–60%. In addition, energy is also expended in transporting raw materials, finished products, and production waste.

Key Points:

- Manufacturing Energy Use: High energy demand for machinery and equipment;
- Wet Processing: Significant energy consumption;
- Transportation: Energy used in moving raw materials, finished goods, and waste

RAW MATERIALS

The textile industry relies heavily on raw materials, particularly oil and gas, for the production of synthetic fibres such as polyester and nylon, accounting for approximately 1.35% of global oil consumption. These synthetic materials, derived from crude oil, contribute to greenhouse gas emissions and environmental degradation.

Key Points:

- Synthetic Fibres: Made from crude oil, contributing to greenhouse gas emissions;
- Cotton Production: Involves heavy pesticide use, significant water consumption, soil degradation, and water pollution.

Cotton, a major natural fibre, requires substantial amounts of water, pesticides, and fertilisers. Its cultivation is responsible for 25% of global insecticide use and 10% of overall pesticide use, leading to freshwater contamination and biodiversity loss.

Labour Practices

The textile industry is a crucial component of economic development and employment in many countries. However, it is often marred by challenging labour practices that demand urgent attention.

POOR WORKING CONDITIONS

- Long Hours and Low Wages: Workers frequently endure extended working hours and receive inadequate compensation;
- Inadequate Safety Measures: Many factories lack proper safety protocols, exposing workers to various hazards.

CHILD LABOUR

- Prevalence: Child labour remains a significant issue, especially in regions with weak or poorly enforced regulations;
- Definition and Impact: According to the International Labour Organization (ILO), child labour involves work by individuals aged 5-18 that violates their rights, safety, and educational opportunities. Despite efforts to eliminate child labour, approximately 168 million children were involved in the industry as of 2012.

HEALTH AND SAFETY CONCERNS

- Exposure to Hazardous Chemicals: Workers are exposed to harmful substances such as reactive dyes, synthetic materials, and formaldehyde, which can cause respiratory and skin conditions;
- Lack of Protective Gear: Many workers do not have access to sufficient protective equipment or healthcare services;
- Risk of Cancer: The industry poses an elevated cancer risk due to the exposure to toxic chemicals and materials.

Towards a Sustainable and Ethical Textile Industry

Addressing the environmental and social issues within the global textile industry requires a comprehensive approach involving sustainable practices, technological innovation, and systemic changes across the entire supply chain. The following strategies are essential:

- Promoting sustainable farming practices for raw materials such as cotton, including organic farming and integrated pest management, can significantly reduce the use of harmful pesticides and fertilisers. Emphasising the cultivation of alternative, less resource-intensive fibres such as hemp and bamboo can also help alleviate the environmental burden.
- Additionally, exploring other natural resources from the agri-food chain, such as agricultural residues and by-products, can offer a sustainable and innovative approach for the textile industry.
- Advancing textile manufacturing processes through the adoption of cleaner technologies and renewable energy sources is crucial. Implementing water-efficient dyeing and finishing techniques can drastically reduce water consumption and pollution. Closed-loop systems and the use of non-toxic chemicals should become standard practice to minimise hazardous waste and emissions.
- Improving labour practices within the textile industry requires concerted efforts involving multiple stakeholders and initiatives. Key strategies include:
 - Enhancing transparency and accountability throughout the supply chain. Implementing blockchain technology can enable real-time tracking of materials and labour practices, ensuring accountability at each stage of production.
 - Strengthening regulatory frameworks and enforcing labour laws are essential for promoting decent working conditions. Governments must adopt and enforce robust labour regulations, including minimum wage laws, limits on working hours, and provisions for health and safety standards.
 - Fostering collaboration between brands, manufacturers, and labour rights organisations is vital for driving meaningful change. Encouraging brands to commit to transparency, improve labour practices, and prioritise environmental sustainability is crucial in this effort.

- Educating consumers about the impact of their purchasing decisions can create demand for ethically produced textiles. Encouraging them to buy less and choose higher-quality products is also essential.

By integrating solutions for reducing environmental impact and improving labour practices, enhancing transparency, empowering workers, advancing technology, incentivising sustainable practices, educating consumers, fostering corporate responsibility, and promoting global cooperation, the textile industry can become more ethical, sustainable, and equitable. These efforts will benefit workers, businesses, and consumers alike, contributing to a healthier planet and a fairer global economy.



SUSTAINABLE SOURCING

There is a growing demand for textiles made from sustainable and eco-friendly materials, such as organic cotton, recycled polyester and bamboo, to mitigate environmental impact.



FAIR TRADE

Ethical consumers often seek out textiles produced under fair trade principles, ensuring that producers receive fair compensation and adhere to ethical labour standards.



CERTIFICATIONS

Various certifications, such as GOTS (Global Organic Textile Standard) and OEKO-TEX, provide assurance that textiles meet specific environmental and social criteria.



CORPORATE RESPONSIBILITY

Companies are increasingly expected to take responsibility for their supply chains, ensuring transparency, accountability, and adherence to ethical standards throughout production processes.

Figure 4 - Summary of ethical considerations for textile industry.

Global Regulations and Standards

The fashion and textile industry is subject to a complex web of international agreements, pacts, and legislation aimed at promoting sustainability, environmental protection, and social responsibility. This document provides an overview of the most significant frameworks and regulations that shape the industry's practices and policies. From global initiatives such as the Paris Agreement and the UN 2030 Agenda for Sustainable Development to specific EU regulations, these measures collectively drive the sector towards a more sustainable and ethical future. Understanding these key legislative and policy instruments is crucial for stakeholders within the textile industry to navigate compliance requirements and contribute to global sustainability goals.

Agreements, Pacts and Others

CONFERENCE OF THE PARTIES UNFCCC (COP)

Refers to the United Nations Framework Convention on Climate Change (UNFCCC) international meeting focusing on climate. This is the main decision-making body of the UNFCCC and includes members of all the countries that are a part of the UNFCCC and usually takes place every year.

UN 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT – 2015

This is a comprehensive action plan that highlights key global challenges that must be addressed for peace and prosperity. Central to this agenda are the 17 Sustainable Development Goals which encompass a wide range of interconnected objectives focused on social, economic, and environmental sustainability (Figure 5).



Figure 5 - Sustainable development goals.

Source: <https://www.un.org/pt/teach/SDGs>

PARIS AGREEMENT – 2016

This is a legally binding international treaty on climate change that was signed in 2015 and entered into force in 2016. A total of 196 parties at COP21 agreed to an overarching goal to limit the increase in the global average temperature by 2°C above pre-industrial levels and pursue efforts to limit it to 1.5°C.

FASHION INDUSTRY CHARTER FOR CLIMATE ACTION**UNFCCC – 2018**

This is an initiative under the United Nations Framework Convention on Climate Change (UNFCCC) that was launched in COP24 in Katowice that was created to drive the fashion sector to achieve net-zero emissions by 2050 and align with the goals set in the Paris Agreement. Signatories to this charter agree to 16 different goals, including to reduce greenhouse gas emissions in 30% by 2030.

UNITED NATIONS ALLIANCE FOR SUSTAINABLE FASHION – 2019

This is an initiative by the UN agencies and other allied organizations that aims to coordinate action and improve collaboration in the fashion sector in order to achieve the Sustainable Development Goals. It encompasses the entire value chain, focusing on environmental issues as well as social issues.

THE SUSTAINABLE APPAREL COALITION – 2009

This is a global non-profit alliance of apparel, footwear and textile companies, NGOs, and academic institutions working to promote sustainability in the fashion industry by creating a universal approach to measuring and evaluating sustainability performance – the Higgs Index.

FASHION PACT – 2019

This is a global coalition of CEOs of leading fashion companies that committed to a series of science based environmental targets focused on three main pillars: mitigating climate change, restoring biodiversity, and protecting the oceans. It aims to be adopted by 20% of the fashion industry. Today, the Fashion Pact has approximately 60 CEO members and more than 160 brands.

EU Legislation

There are two types of legislation that the EU can put forward: regulations and directives (Figure 6). Regulations act as law that applies directly to every EU country as it is. On the other hand, directives set out a goal that all EU members must achieve, after a directive is approved by the EU, each member state has a 2-year period to devise their own laws on how to achieve that same goal.

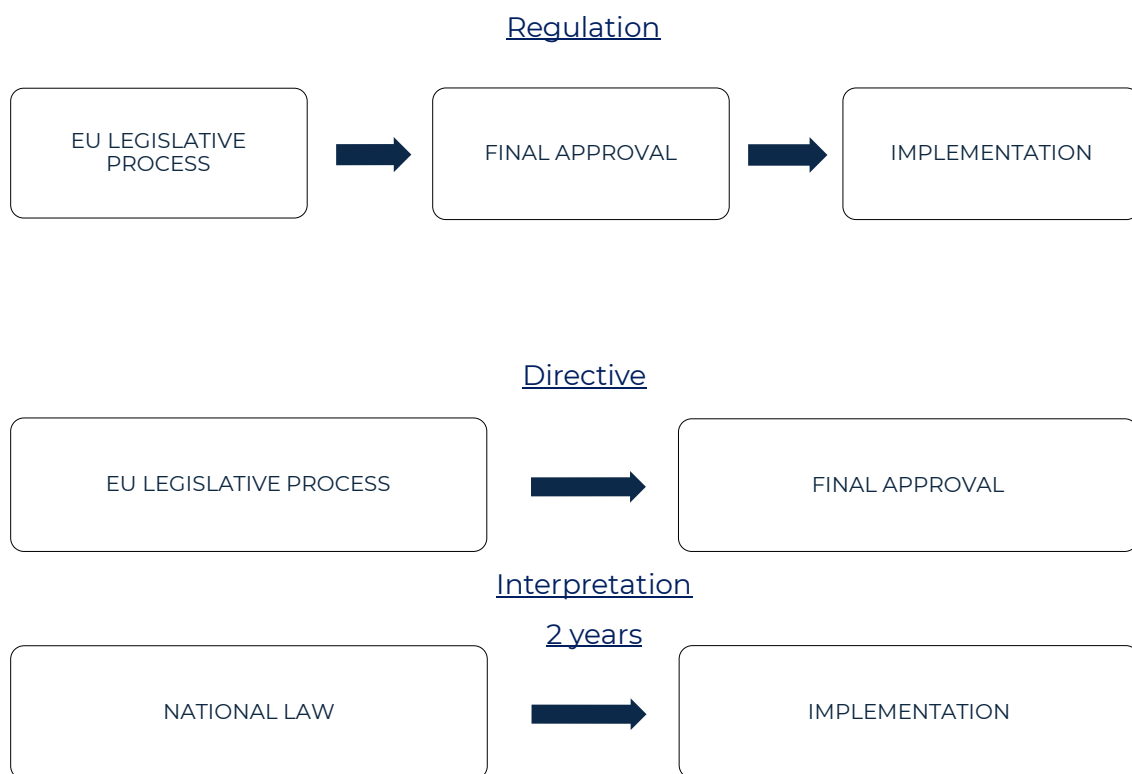


Figure 6 - EU legislation - regulations and directives.

Both regulations and directives must go through EU's legislative process that starts with the submission of a legislative proposal by the European Commission, that then needs to be reviewed, accepted, rejected or potentially amended by the European Parliament and the Council of the EU. Legislation is only approved if both parties agree on the text. Delegated Acts are a form of secondary legislation that allows the EU to supplement or amend certain non-essential elements of a legislative act.

Below are the most relevant regulations for the sector regarding sustainability.

REGULATION 2011/1007– TEXTILE FIBRE NAMES AND RELATED LABELLING AND MARKING OF THE FIBRE COMPOSITION OF TEXTILE PRODUCTS – 2011

This regulation establishes guidelines for the naming of textile fibres and their definitions, creating a standard for textile composition labelling with the aim of providing accurate information to consumers. Additionally, it covers the labelling requirements for textile products that include non-textile components derived from animals. It also outlines the analytical methods for verifying the accuracy of the information provided on labels or markings.

The regulation does not cover other labelling domains beyond fibre composition, which has led to different countries adopting varying measures, increasing complexity. In light of the EU Strategy for Sustainable and Circular Textiles, the European Commission is considering a proposal to revise the regulation by the end of 2025. The revision aims to ensure regulatory clarity and consistency, provide improved fibre identification that accounts for newly developed materials, and incorporate digital labelling technologies.

REGULATION ON THE REGISTRATION, EVALUATION, AUTHORISATION AND RESTRICTION OF CHEMICALS (REACH) – 2007

This regulation establishes a framework that safeguards human health and the environment from potentially hazardous chemicals. It moves the responsibility to the industry for providing safety information on the chemicals used or sold.

Manufacturers and importers must register their chemicals and respective properties and other information on the database of the European Chemical Agency (ECHA). Compliance with REACH is crucial for market access within the European Economic Area.

EU GREEN DEAL – 2019

The EU Green Deal is a strategic framework whose main objective is for the EU to achieve carbon neutrality by 2050 while maintaining a modern and competitive economy that is decoupled from resource use. It serves as a roadmap guiding the development of other regulatory and non-regulatory documents:

CIRCULAR ECONOMY ACTION PLAN (CEAP) – 2020

This plan is a European Union initiative that aims to accelerate the transition to an economic model in which activities do not depend on the extraction of new raw materials and do not produce waste. It serves as a plan to inform the orientation of EU legislation and the articulation between them.

EU STRATEGY FOR SUSTAINABLE AND CIRCULAR TEXTILES – 2022

Under this strategy, a set of regulatory and non-regulatory actions has been proposed. The non-regulatory actions include the “Reset the Trend” campaign, the Transition Pathway for the Textiles Ecosystem, the European Circular Economy Stakeholder Platform, and calls launched under the Horizon Europe programme. The regulatory actions are described below:

ECODESIGN FOR SUSTAINABLE PRODUCTS REGULATION (ESPR) – 2024

It builds on the former Ecodesign Directive, which primarily covered energy-related products, and establishes a framework to significantly improve product circularity, energy performance and other environmental sustainability aspects, as well as traceability. Its main features include ecodesign requirements, legislation on unsold consumer goods, and the Digital Product Passport.

A wide range of mandatory ecodesign requirements will be established for physical goods, including textiles, addressing aspects such as durability and reusability, the presence of substances that inhibit circularity, energy and resource efficiency, recycled content, and carbon and environmental footprints.

A direct ban on the destruction of unsold textiles and footwear will be introduced and will apply two years after the entry into force of the Regulation. Small and micro-sized enterprises are exempt, while medium-sized enterprises will benefit from a six-year exemption period. Product categories or companies not covered by the ban will be required to disclose the number of discarded products, by type or category, as well as the reasons for their disposal.

The Digital Product Passport (DPP) is a tool designed to provide consumers and businesses with information on a product's environmental footprint, as well as on a set of attributes such as those mentioned in the previous paragraph. This information will be accessible through the scanning of a data carrier, thereby improving transparency and traceability and enabling consumers and businesses to make informed purchasing decisions.

Expected timeline: the delegated act defining the content and technical requirements of the DPP is expected to be finalised by the end of 2025. The first DPPs are expected to become operational by 2027; however, companies are encouraged to be proactive in preparing for its implementation ahead of its formal rollout.

EMPOWERING CONSUMERS FOR THE GREEN TRANSITION DIRECTIVE (2022) AND GREEN CLAIMS DIRECTIVE (2003) – THE GREENWASHING DIRECTIVES

The Empowering Consumers for the Green Transition Directive was proposed to amend the Unfair Commercial Practices Directive (UCPD) and seeks to ensure that consumers are provided with better information on product durability, reparability, and environmental and social impacts. These criteria will be added to the list of product characteristics in relation to which traders are prohibited from misleading consumers. The Directive will enter into application in 2026.

The Green Claims Directive aims to ensure that environmental labels and claims are reliable and trustworthy. To this end, it establishes clear criteria on how companies must substantiate their sustainability claims, as well as requirements for independent verification. The Directive targets voluntary environmental claims covering environmental impacts, thereby preventing vague, unsubstantiated or misleading claims.

Both Directives form part of the New Consumer Agenda adopted in 2020, which sets out a vision for EU consumer policy for the period 2020–2025.

WASTE FRAMEWORK DIRECTIVE – 2023 AMENDMENT

This directive sets specific basic concepts related to waste management in the EU. It currently requires EU member states to set up separate collection points for textiles by 2025.

In 2023, a new amendment was introduced with a specific focus on textile waste, proposing a mandatory and harmonised Extended Producer Responsibility (EPR) scheme that would make producers responsible for the entire life cycle of their products. Under this framework, manufacturers would be subject to financial obligations determined by the recyclability and environmental impact of their textile products, a concept known as “eco-modulation”.

The Directive also clarifies certain definitions relating to waste and reusable textiles. This clarification is intended to complement the Waste Shipment Regulation, which, among other provisions, restricts the shipment of textile waste for disposal and imposes additional controls.

EU TAXONOMY – 2020

This is a common classification system that sets standards for economic activities that can be considered environmentally sustainable and therefore aligned with the objectives of the EU Green Deal. The EU Taxonomy can be used to guide sustainable practices, increase transparency, prevent greenwashing, support policy objectives and attract investors.

Companies falling within the scope of the Corporate Sustainability Reporting Directive (CSRD) are required to disclose which of their economic activities align with the EU Taxonomy and to what extent.

The EU Taxonomy was introduced under the 2018 Action Plan on Financing Sustainable Growth, which was subsequently replaced by the Sustainable Finance Strategy in 2021. Under this strategy, a delegated act was adopted to complement and further specify the EU Taxonomy.

SUSTAINABLE FINANCE STRATEGY – 2021

This strategy builds on the previous 2018 “Action Plan on Financing Sustainable Growth” and proposes actions in four main areas: transition finance, inclusiveness, resilience and contribution of the financial system and global ambition.

GREEN BOND STANDARD – 2023

This is a voluntary standard that aims to provide a clear benchmark, prevent greenwashing and facilitate the financing of environmentally friendly and climate-related projects. It relies on the EU Taxonomy to define green economic activities, thereby increasing transparency and enabling investors to compare projects in terms of sustainability.

This standard may be particularly beneficial for textile companies seeking to transition to more sustainable practices, as it provides a structured framework for accessing external financing.

CORPORATE SUSTAINABILITY REPORTING DIRECTIVE (CSRD) – 2023

This directive supplanted the Non-Financial Reporting Directive (NFRD) and aims to bring uniformity in the way companies report ESG impacts. It requires all large companies and other listed small and medium companies, as well as non-EU companies to report on ESG matters using the European Sustainability Reporting Standards (ESRS).

For the 2024 financial year, the first companies will have to apply the new rules for reports published in 2025.

CORPORATE SUSTAINABILITY DUE DILIGENCE DIRECTIVE (CS3D) – 2024

Under this Directive, companies are responsible for addressing adverse impacts on human rights, environmental matters, and corporate governance in their own operations, as well as throughout their supply chains (upstream and, in certain cases, downstream). The Directive primarily applies to large corporations. Companies will be required to identify, prevent, and mitigate such impacts, and to implement a plan for climate change mitigation.

The Directive is expected to be gradually phased in from around 2027, with full compliance required by 2029 for all companies falling within its scope.

THE REGULATION ON PROHIBITING PRODUCTS MADE WITH FORCED LABOUR – 2022

Proposed in 2022, this piece of legislation is still being discussed, its main objective of this legislation is to prohibit the commercialization of products using forced labour within the EU, as well as their export. Along with CS3D, this legislation is EU attempt at combating forced labour.

Figure 7 summarizes all the EU legislation described previously.

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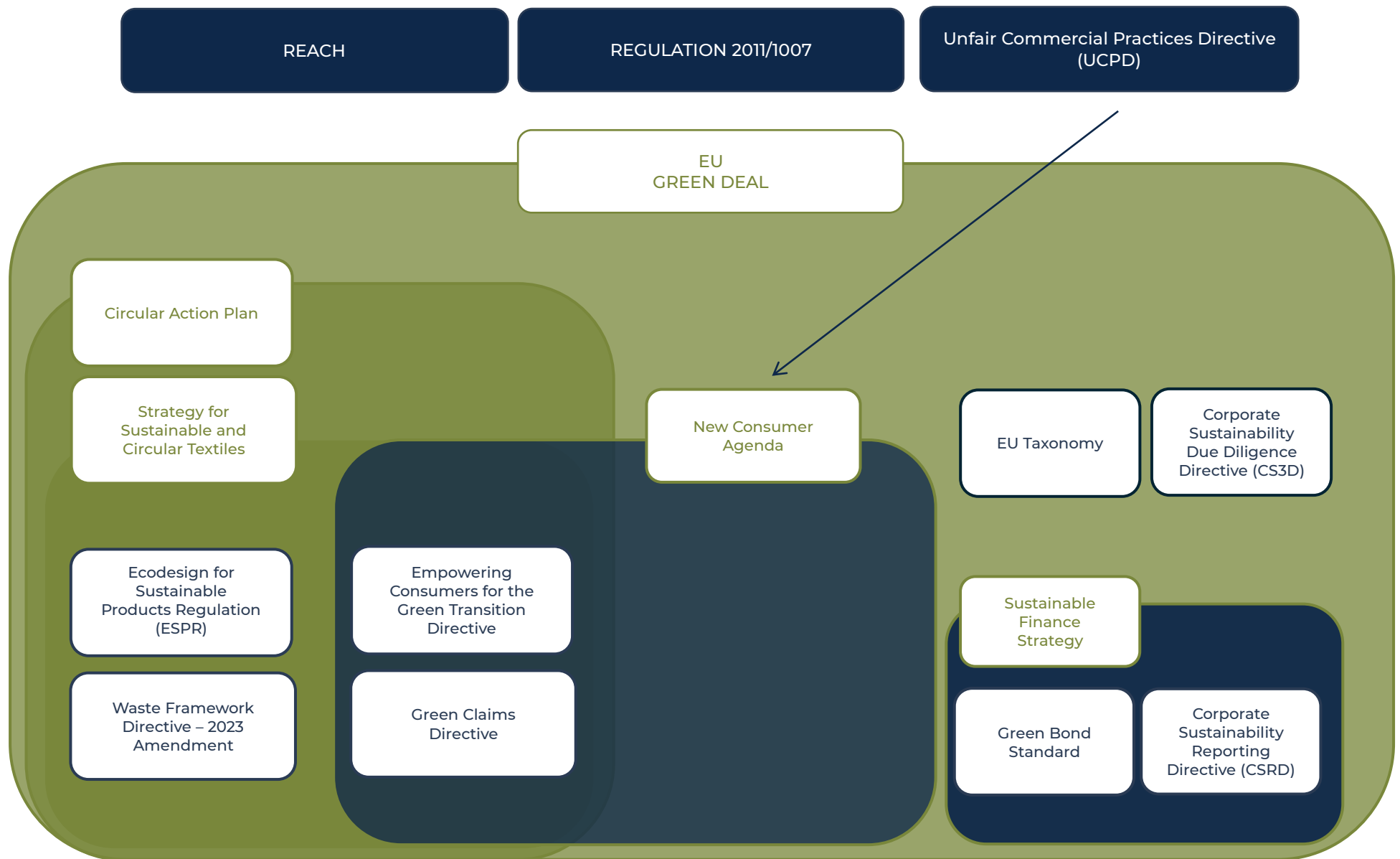


Figure 7 - Strategies and legislation on textiles within the EU Framework

● Strategies
 ● Regulations and directives

Case Studies and Best Practices

The objective of this section is to provide each region with the opportunity to present case studies and best practices that align with their specific objectives and requirements. By sharing these examples, trainers can demonstrate the practical application of the information presented.

The textile industry is undergoing significant transformation, driven by global initiatives and collaborative efforts focused on sustainability, innovation, and competitiveness. CITEVE (Technological Centre for the Textile and Clothing Industries of Portugal) has been at the forefront of numerous successful projects and partnerships. The case studies presented below highlight the impactful work carried out by CITEVE and its partners in advancing the textile industry through innovation, sustainability, and collaboration.

TEXBOOST - ADVANCED SUSTAINABLE SOLUTIONS

TexBoost was a Portuguese collaborative project led by CITEVE, involving more than 20 partners, including companies, universities, and R&D centres. The project focused on developing advanced and sustainable solutions across the entire textile value chain.

KEY ACHIEVEMENTS	BEST PRACTICES
Development of biodegradable and recyclable textile materials.	Collaborative Innovation: Bringing together diverse stakeholders to foster a multidisciplinary approach.
Introduction of smart textiles with integrated electronic components for health and sports applications.	Sustainability Focus: Prioritizing eco-friendly materials and processes to address environmental concerns.
Implementation of advanced production processes to reduce environmental impact.	Market Relevance: Aligning innovations with market needs to ensure commercial viability.
Website: texboost.pt/en/home-em	

FACTIVE - FUNCTIONAL AND COMFORTABLE TEXTILES FOR ACTIVE AGEING

FACTIVE was a European project coordinated by CITEVE, aimed at enhancing the quality of life for older adults through innovative textile solutions. The project developed functional and comfortable clothing specifically designed to meet the needs of the elderly.

KEY ACHIEVEMENTS	BEST PRACTICES
Creation of textiles with enhanced comfort, thermal regulation, and moisture management.	User-Centred Design: Engaging end-users in the design process to ensure the products meet their specific needs.
Development of garments with integrated health-monitoring capabilities.	Interdisciplinary Collaboration: Involving experts from healthcare, engineering, and textile sectors.
Introduction of easy-to-wear and care clothing designs to aid mobility and independence.	Technology Integration: Utilizing smart textiles to add value and functionality to traditional garments.
Website: factiveproject.eu/about/	

ITECHSTYLE SHOWCASE- INNOVATION AND NETWORKING PLATFORM

ITechStyle Showcase is an international textile trade fair held in Portugal, organised with substantial involvement from CITEVE. It serves as a platform to showcase innovation, facilitate networking, and promote business opportunities.

KEY ACHIEVEMENTS	BEST PRACTICES
Hosting numerous exhibitors and visitors from around the world, promoting Portuguese textiles.	Trade Fair Excellence: Creating a high-quality event that attracts global attention and participation.
Showcasing the latest technological advancements and sustainable solutions in textiles.	Innovation Showcase: Highlighting cutting-edge developments to inspire industry-wide adoption.
Facilitating partnerships and collaborations between industry players.	Networking Facilitation: Providing a space for industry leaders to connect, collaborate, and drive forward collective growth.
Website: citeve.pt/products___services/itechstyle/itechstyle_showcase-7e878785	

REGIOGREENTEX

RegioGreenTex focuses on strengthening textile circularity in Europe's regions, aligned with the European Green Deal. The project promotes collaboration among industry, government, research institutes, and the public to establish a systematic circular economy for textiles across the EU.

KEY ACHIEVEMENTS	BEST PRACTICES
Creation of a digital platform to connect supply and demand in textile recycling.	Mapping regional needs and potentials for circular economy implementation.
Support for SME pilot projects to develop new materials with increased recycled content.	Promoting collaboration and sharing technologies and methodologies
Establishment of five regional textile recycling hubs.	Generating regional investment opportunities.
Website: regiogreentex.eu/dashboards/home	

be@t – BIOECONOMY AT TEXTILES

The "Bioeconomy at Textiles" website focuses on promoting sustainable practices and innovations within the textile industry. It highlights the integration of bio-based materials and processes to reduce environmental impact and enhance economic sustainability.

KEY ACHIEVEMENTS	BEST PRACTICES
Development of bio-based textile fibres.	Collaboration with industry partners to scale sustainable solutions.
Implementation of eco-friendly manufacturing processes.	Emphasis on reducing carbon footprint throughout the supply chain.
Collaboration with industry partners to scale sustainable solutions.	
Website: bioeconomy-at-textiles.pt	

Conclusion

The handbook's central conclusions and essential points can be summarised as:

Geographical Distribution of Manufacturing and Retail: Manufacturing is predominantly located in developing countries, taking advantage of lower labour costs and abundant resources. Retail operations, by contrast, are mainly based in developed countries (Europe and North America), where consumer purchasing power is higher and market infrastructure is more advanced.

Supply Chain Operational Differences: Developed countries employ highly automated processes, enhancing efficiency and reducing reliance on manual labour. In developing countries, production remains largely labour-intensive, providing employment opportunities but often facing challenges related to working conditions and labour rights.

Global Push for Sustainability: Growing awareness of sustainability has led to the creation of international pacts, agreements, and regulations aimed at reducing the environmental impact of textile production and consumption. The European Union is at the forefront of this movement, enacting legislation and standards to promote sustainable practices across the textile industry.

Technological and Innovation Disparities: Developed countries lead in technological innovation, driving advancements in production methods, sustainable materials, and waste management. Developing countries are gradually adopting these innovations, often supported by international collaborations and investment.

Economic and Social Impacts: The global dynamics of the textile industry influence economic growth, employment, and social development, particularly in manufacturing hubs within developing countries. Efforts continue to balance economic benefits with ethical considerations and sustainable development goals.



PreVEnting and ReDucing the tExtiles waste mountain in the MED area

Project overview

The VERDEinMED project is an initiative funded by the Interreg Euro-MED programme to promote the circular economy in the textile sector. VERDEinMED is a thematic project that will provide a support service to boost circularity in the textile value chain for businesses, consumers, policy makers and academia.

The project is part of the Innovative Sustainable Economy mission of the Euro-MED programme, which seeks cooperation between Mediterranean countries to promote smarter and greener business models. VERDEinMED project brings together 10 partners and 15 associated entities from Greece, Spain, Portugal, Italy, Slovenia, North Macedonia, Bulgaria, Tunisia, Turkey, Belgium and Lebanon



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Start-End date

01/01/2024-30/09/2026

Project type

Thematic project

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Coordinator

Chrysovalantis Ketikidis, Centre for Research and Technology-Hellas, Greece

Consortium

-CERTH – The Centre for Research & Technology, Hellas
-Bulgarian Fashion Association
-CITEVE
-Confindustria
-Consorci de la Ribera
-Corporación Tecnológica de Andalucá.

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