



STEP2030 Sustainable Textiles
European Partnership

Manifesto draft

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Introduction

Over the coming years, the European Union is confronted with a dual challenge, encompassing environmental and climate change concerns and the need to recover from the economic and societal repercussions of the war in Ukraine, the energy crisis, and the COVID-19 pandemic. Significant transformations to current production and consumption systems are necessary to address these challenges and achieve a competitive, carbon-neutral, healthy, and resource-efficient economy.

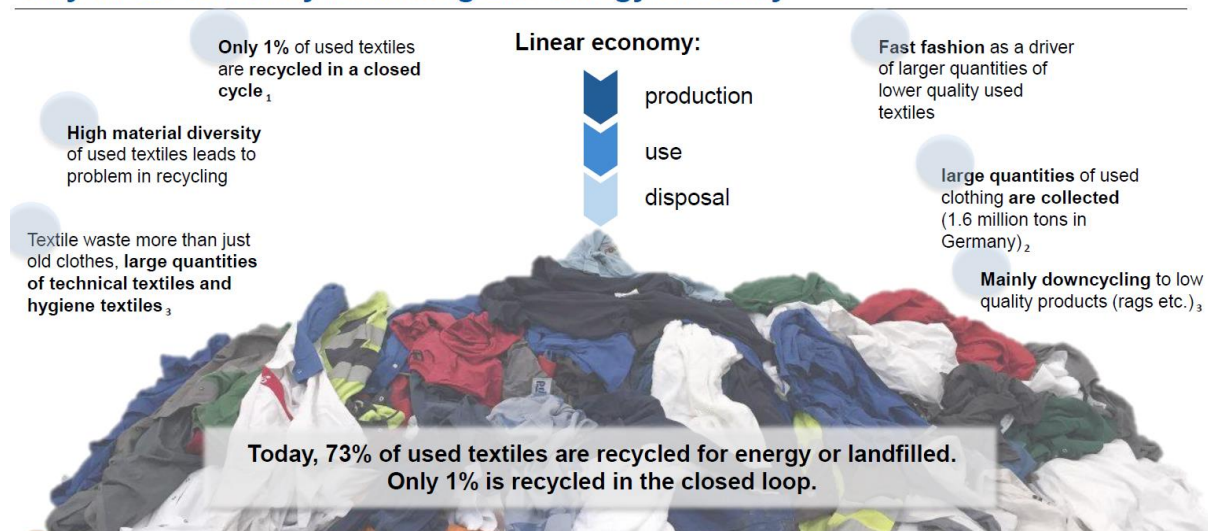
The textile sector has been recognised as a strategic sector in the EU's new industrial strategy, but at the same time is challenged to become more sustainable and digital, while remaining globally competitive. The EU Textile Strategy, adopted one year ago by the European Commission, is setting an ambitious roadmap to realise that vision.

The roadmap clearly indicates that *innovation* is an important key to successfully make that transition: “*enhancing research and innovation and promoting investments in the sector are essential to tap into its potential to create sustainable growth and jobs*”¹. This was also confirmed in the ERA industrial technology roadmap for circular technologies and business models in the textile, construction and energy-intensive industries, which highlights the investments needs of the sector to become more green and digital.

A European Partnership for Textiles under Horizon Europe aims to facilitate the emergence and deployment of innovative and circular solutions, particularly in developing efficient raw and secondary raw materials and fostering talent generation.

The Partnership's strategic objectives include securing sustainable and diversified raw materials, increasing textile-to-textile recycling capacity, improving the aesthetic and functionality of textiles, and supporting design as a driver for sustainable innovation in the fashion/textile industry. Furthermore, the Partnership will promote the digital transformation of the textiles ecosystem and stimulate skills development to meet the demands for technological advancement and new digital and smart specialisation approaches.

Current situation of the textile cycle: only linear economy landfilling and energy recovery



¹ COM(2022) 141 Final, EU Strategy for Sustainable and Circular Textiles, p10

Overview

The textile ecosystem is an integral part of the EU economy, with a turnover of EUR 150 billion and over 147 000 companies. It employs around 1.3 million workers, with small and medium-sized enterprises representing over 99.5% of all businesses and employing 74.4% of the workforce. The textile ecosystem encompasses the transformation of natural, man-made synthetic and artificial fibres into yarns and fabrics, home textiles, industrial filters, technical textiles, carpets, clothing and footwear. Furthermore, Europe's luxury brands shape the global fashion and design landscapes.

The textile and clothing industry is vital to many regions in Europe like Lombardy, Tuscany and Piedmont in Italy, Norte in Portugal and Cataluña and Comunitat Valenciana in Spain. Over 40% of EU apparel is produced in Italy and few other countries. The workforce's highest shares of the textile industrial ecosystem can be found in Bulgaria, Portugal, and Romania. The European textile ecosystem operates in global value chains, with imports mainly from Asian countries (30% from China) amounting to EUR 106 billion in 2021. On the other hand, EU exports had a total value of EUR 58 billion, making the EU the second-largest exporter after China.

The sector's labour-intensive nature and concentration of small and medium-sized enterprises make it an **essential contributor to social and economic cohesion in Europe**, with significant potential for further modernisation and innovation. While the textile industry is often called a "traditional" one, its modernisation efforts have led to increased productivity and the shift towards high-quality products.

Textile Value chain

The textile value chain refers to all the activities involved in the life cycle of a textile product, including designing, product development, production, distributing, retailing, and disposing of it after its useful service life. The value chain begins with raw material (natural or manmade), fibre production and fibre preparation, spinning fibres into yarn, creating and fabric finishing, cutting, sewing, and distributing to consumers. Textile products can be recycled or re-used for a different purpose, but ultimately they may end up in end-of-life treatment, such as in a landfill or incinerator plant. The value chain is complex, involving physical processes and non-manufacturing activities like design, marketing, retailing, advertising, publishing and sales.

The textiles ecosystem comprises various products, including high-end and technical textiles for multiple applications such as automotive, medical, agrotextiles, and protective equipment. Technical textiles are developed and produced for their performance or functionality rather than appearance, and include a range of products and applications such as industrial filters, textiles for medical and hygiene applications, protective textiles, and functional clothing for sports applications. Technical textiles are made from natural and synthetic fibres and produced through various processes like knitting, weaving, braiding, nonwoven, and tufting.

The textiles ecosystem is interconnected with other industrial ecosystems through its value chains. Textile materials have unique properties and can be functionalised differently, making them irreplaceable in many applications. Furthermore, textiles and textile-based composites are expected to replace many metal and plastic materials currently used in automotive, shipbuilding, aeronautics, machinery, electronics, medical devices, construction, and agriculture. As the world's population increases, new application areas for textiles are emerging, and user requirements for textile products are rising, resulting in the growth and evolution of the industry.

Main challenges

The industry faces challenges threatening its growth and competitiveness, including environmental and social pressures, green claims, fast fashion trends, adaptation to digitalisation and e-commerce, competition from low-cost countries and connected to it the sector-wide overproduction, lack of skilled workforce, and fragmentation. EU we have strongest legal vanguards in water, energy, emissions, chemical management, waste and wastewater, etc. This high performance sometimes it is not recognized by the market. We produce with High standard and international market does not recognize it. However, these should be translated into opportunities by focusing on developing sustainable practices, investing in technology, and improving working conditions in textile and clothing factories worldwide to remain competitive and relevant in the global market.

The continued growth of textile production and consumption significantly impacts the climate, water and energy consumption, and the environment. Therefore, the European textile and clothing industry must balance the "triple bottom line" of people, planet, and profit by implementing **sustainability** and circularity principles in response to market and regulatory requirements. Furthermore, the industry must make significant technological, financial, and human efforts to align business operations with sustainable practices to meet the increasing end-market demand of a growing population while operating within sustainable planetary limits. There are already successful examples in the textile sectors where circular materials and processes have been successfully implemented but this implementation is not yet recognized by the market.

The textile industry has undergone a significant **digital transformation** in recent years, driven by increasing consumer demand for personalised products, integrating IoT applications in textile manufacturing, automated production and logistic processes and new industry 5.0 approaches, that are significant in the textile production where human workforce will remain crucial. In addition, the Covid-19 pandemic has further accelerated this need for digitalisation. The pandemic has shown buyers do not need to be as actively involved in manufacturing as before by implementing a more digital way of working. As a result, their orders can be monitored from a distance, a trend that will most likely continue in the future.

The European textile industry faces intense **global competition** due to various phenomena such as globalisation, liberalisation, relocation, and international outsourcing. Therefore, the sector must promote greener and fairer value chains across borders and continents to compete.

Maintaining the industry's success requires a qualified and **skilled workforce**, which is a vital asset for the competitiveness and growth of companies at the regional, national, and European levels.

Therefore, the industry must provide the necessary training and qualifications to attract younger workers and adapt education schemes to the sector's needs.

Finally, the industry needs a more coordinated approach to join forces between R&D&I and the supply chain, to avoid **fragmentation**. By working together, the industry can develop more innovative and sustainable products and improve the value chain to enhance its competitiveness and growth.

Innovation capacities

The European Union textile and fashion industry is highly innovative, ranking high in the number of patents (over 6,600 between 2015 and 2019), and it also boasts the highest number of registered industrial designs in the world (208,000 in 2019).

However, trade secrecy is the preferred protection mechanism as companies prefer to avoid public disclosure of innovations and reducing the costs and administrative burden of obtaining and maintaining IP rights. Germany is the leader in patent applications, followed by Italy and France, with Italy and Germany being more active than other EU players.

However, this industry's innovation scope exceeds R&D expenditures and IP rights. Marketing and organisational innovations and the application of breakthrough technologies are equally important drivers for innovation.

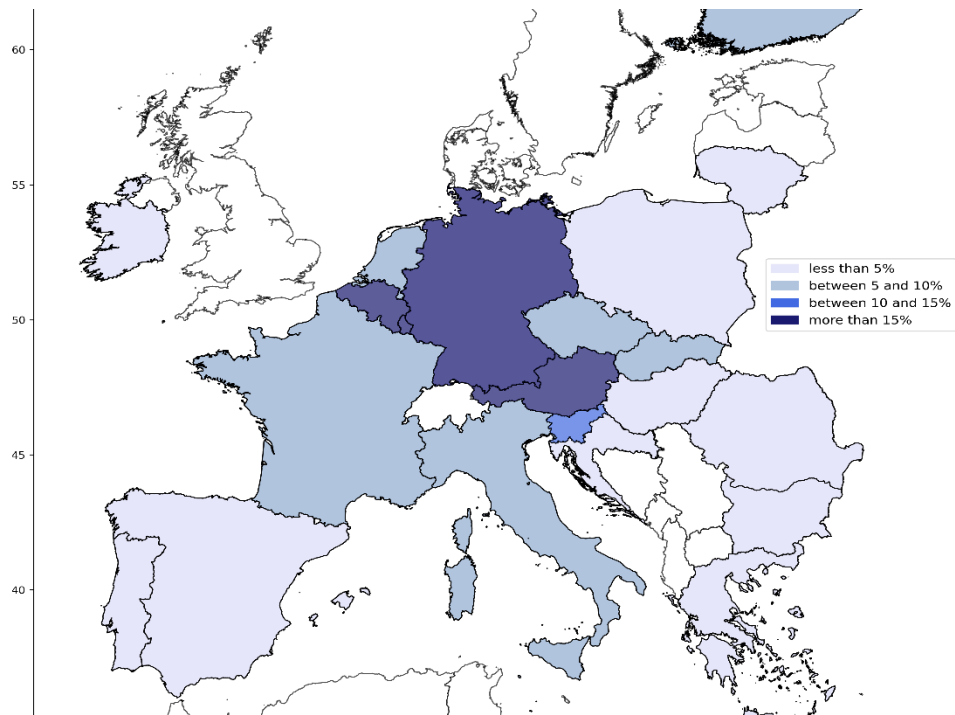


Figure 1 - Percentage of patents by textile companies in the EU Member States

The sector is primarily made up of SMEs, and as a result, R&D&I and innovation activities are often limited by a lack of financial resources and strategic direction. However, textile clusters have emerged in various European countries, bringing together industry, academia, and research centres to advance a more knowledge-based and innovative sector. These clusters strengthen the linkages and cooperation between companies, improving their competitiveness and productivity. Additionally, textile clusters drive the growth of universities, research, and technology support services and generate increased tax revenue that can be invested in the public good.

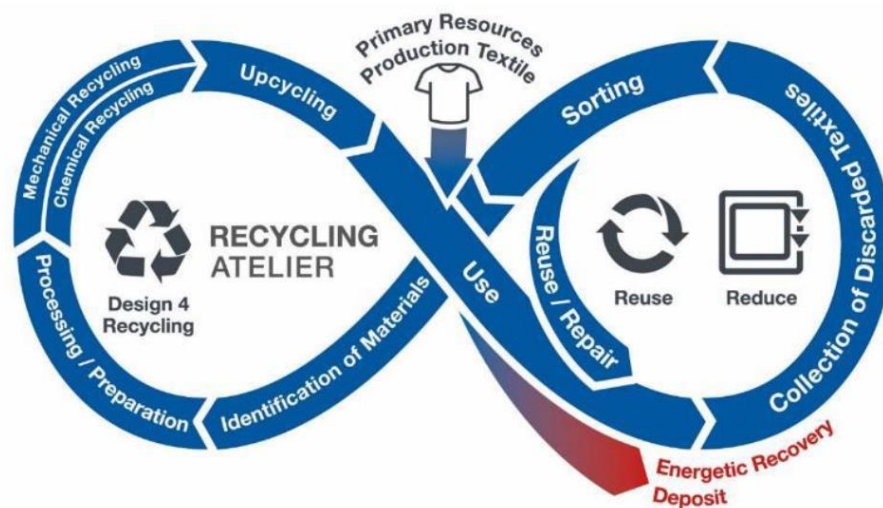
Design and new product development are typical functions in most textile and clothing companies, but they often rely on collaborations with external knowledge and research or technology service providers. These external service providers can range from small operations with limited technological facilities to large organisations with several hundred researchers, specialised technical staff, and extensive state-of-the-art specialised installations. While public authorities have generally reduced their direct financial commitment to these centres, most income is generated by contract research, consulting, or testing work for private sector customers or by competitive project-based public funding.

Universities, polytechnics, colleges or universities of applied sciences play a critical role in higher education, providing advanced knowledge and qualifications in specialised scientific subjects or professional domains. Many of these institutions also offer practical research and small-scale manufacturing trials and testing as part of internal research work or collaborative projects with external partners, including industry (mostly big players). Based on the long-standing tradition and technological advancement of the European textile and clothing industry, a large, highly diversified, internationally leading textile higher education and fundamental research infrastructure exist across Europe.

Technical research centres are essential as service providers for the textile and clothing sector. These centres mainly operate regionally and are very well embedded in the industrial landscape. Consequently, they often play a significant role in the innovation process of companies and, in this way, in securing competitive advantages and the success of the textile sector.

Nevertheless, as the textile & clothing sector's competitive environment changes, the technological centres face difficult strategic questions.

Overall, sustained and concerted efforts by all stakeholders over the following years are necessary to bring about systemic change with a measurable impact on global climate change, biodiversity, environmental and human health and well-being, without undue losses of prosperity. With suitable investments in technology and innovation and the support of networks and clusters, the European textile industry can continue to evolve and maintain its position as a global leader in product innovation.



Solution only by Cooperation and Open Innovation

STEP2030

Based on the "ERA Industrial technology roadmap for circular technologies and business models", the estimated investment requirements for achieving circularity in the textile sector by 2030 and expanding the textile recycling industry throughout the value chain, including collection, sorting, and recycling, are within the range of EUR 5 to 7 billion. In the fashion sector, circularity could potentially reach 80% by 2030 if the respective investments are done.

While Horizon Europe is the EU's primary funding programme for research and innovation, the textile industry faces challenges in securing specific funding due to low success rates in a highly competitive funding environment as well as high fragmentation of textile specific calls in the different funding programmes due to the lack of a dedicated research and innovation programme. That leads to the fact that SMEs are discouraged from participating in open calls and that these companies miss out in innovation and research activities. Furthermore, the current funding programmes often publish repetitive calls that only support one-sided research and innovation activities that lead to a duplication of efforts and parallel structures.

As suggested in the stakeholder consultation report on the co-creation process for a transition pathway in the textile sector, a co-programmed European Partnership under the Horizon Europe Programme would be best suited to enhance innovation capabilities in the textile ecosystem.



The strategic objectives of the Partnership include:

- securing sustainable and diversified raw materials (recycled fibres and sustainable bio-based fibres represent opportunities to replace raw materials with high life cycle environmental profiles at an increasing pace)
- increasing textile-to-textile recycling capacity, improving the aesthetic and functionality of textiles
- supporting design as a driver for sustainable innovation in the fashion/textile industry

Additionally, the Partnership will enable the digital transformation of the textiles ecosystem and stimulate skills development to meet the needs for technological advancement and new digital and smart specialisation approaches.

The ensemble of the confederations and research networks that support this Partnership proposal ensures a broad coverage of EU Member States. In addition, leading European fashion and design brands, waste management industry representatives, and environmental NGOs are essential stakeholders that should also be part of the Partnership. The formal contributions and commitments of the partners, in kind and/or financial contributions, and co-funding of the R&I activities would be provided by the private sector stakeholders in line with the general financing rules of Horizon Europe.

STEP2030 is a €1 billion public-private partnership between the European Union and the Industry, operating from 2025-2030 within the framework of Horizon Europe. The EU will contribute up to €500 million, mainly for textile research and innovation projects, while the private stakeholders from the sector will provide at least €500 million in in-kind contributions and additional activities. The total turnover of the sector in the EU is 150 billion €. If the sector spent 1% of the turnover on innovation it would mean that roughly 1.5 billion€ would be available as contribution to the partnership.

Key areas of intervention

Four innovation topics have been identified that would be of relevance for the Partnership:

1. Durable, circular and biobased materials and processes

The textile industry has a significant environmental impact, with over 65% of the output being synthetic fibres from fossil resources. Meaning, efforts must be made to transition from fossil-based to renewable carbon sources to reduce the industry's carbon footprint. This requires scientific breakthroughs, new processing technologies, smarter purchasing decisions, and stakeholder collaboration. While the transition will take many years, optimising resource footprints in production and using current materials and processes can still have a massive impact. Moreover, efforts in R&D have to focus on these key aspects:

- Fibers and fiber additives from biobased origin for high-end applications

- Replacing petrol-based chemicals for fibers and focus on biobased polymers
- Exploiting lignin as high value feedstock for regenerated fibres (not just as filling material)

2. Safe, low-footprint products, processes & responsible supply chains

The industry must strive for greater safety, sustainability, and responsibility in its operations and products, while policymakers need to set legislative frameworks that limit negative impacts. In addition, it is essential to develop a better understanding of the resource impacts of textile materials, products, and processes and address the lack of transparency and reliable traceability of data in the global textile supply chain. In this regard the sector has to undergo important changes regarding:

- Replacing solvent-based processes and harmful functional chemicals in textiles and textile processes
- Recycling or reuse of textile materials, which is still in its infancy as procedures to remove color, legacy chemicals, chemical dismantling is still to be explored.
- Low impact textile operations
- Transparent supply chains and new working environments

3. Digitalised textile materials, products, manufacturing, supply chains and business models

The digitalisation of the textile industry is a continuous process that offers numerous benefits. It enhances creativity, improves efficiency and low resource footprint, enables new business models, and provides workers with safer and more meaningful jobs. This transformation is possible through digital and biotech technologies, intelligent local textile productions, high-performance materials, and circular economy technologies. In order to achieve this transformation, the industry must adopt principles from the electronics and ICT industries, which can increase productivity, speed, versatility, resource efficiency, and customer value creation. The textile factory will approach the principles of industry 5.0 and then insert enabling digital technologies such as artificial intelligence, 5G, digital twins within the value chain with a human centric focus, along the internal value chain and through the supply chain to become attractive, efficient, traceable and therefore more reliable for customers. The introduction of a digital product passport also needs new ways of secured data collection but would contribute to the sectors green transition. Additionally, the industry must shift from physical to virtual designs and materials, and all stakeholders need to adapt to technology development. More R&D efforts should be made in:

- Modeling and virtual prototyping (digital twins) for textile products & processes, which is not yet addressed by the sector
- Robots and AI to assemble, repair and disassemble textile products which is still not possible and until now needs to be done

4. Smart high-performance materials

Developing smart high-performance materials, such as textiles with micro-and nano-electronic components and systems, hybrid materials, and textile-based implants offers significant potential for growth in new markets. Strengthening research and innovation ecosystems and public support for flagship research projects is a high priority to maintain Europe's lead in the fibre and textile industry. The industry must continue to adapt and innovate to meet the evolving needs of its high-added-value end uses. To reach this goal it is important to develop:

- Low-cost and low-impact high performance fibres & textiles
- Textile surface multi-functionalisation for technical applications
- Rapid small-scale manufacturing of advanced textile and hybrid materials/components
- E-textiles for smart wearables and surfaces and their efficient industrial manufacturing
- Bio-engineered/biocompatible materials for medical applications

Proposed governance

A governance structure will be implemented to create a dedicated innovation space for the European textile ecosystem. This entity will comprise private partners such as European associations representing the industry's interests, leading European fashion brands and textile companies, recycling industry representatives as well as the above mentioned research and innovation entities. The structure will allow to downstream calls for proposals to involve the whole textile ecosystem and guarantee a higher success rate thanks to a specific Strategic Research and Innovation Agenda.

The primary goal of this entity is to transform the European textile and clothing industry into a sustainable global industrial player that provides significant employment and economic value to Europe. The transformation process will focus on exploiting research, innovation, and knowledge orientation across all industry business functions and sub-sector activities, including new business opportunities for fibre and textile-based materials, products, and production processes in novel application fields. The process will also overcome the fragmentation of European textile-clothing research, ensuring that research capacities and activities are developed with scientific-technological excellence, industrial relevance, and resource efficiency principles in mind.

This entity will prevent parallel, repetitive research work and competition where cooperation should be the norm by connecting and valorising existing expert networks, platforms, clusters, and cooperative structures at European, national, and regional levels. As a result, the industry can leverage research, innovation, and knowledge to transform the sector into a sustainable and competitive global player.

Focus: Cascade funding

In order to promote a more sustainable and digital human-centric industry in Europe, targeted funds and programmes should be set up to support SMEs in innovating their products and processes.

Therefore, cascade funding projects, which offer reduced administrative burdens, shorter time-to-grant, and facilitated lump-sum mechanisms, are particularly beneficial for textile SMEs, as they are tailored towards the needs of small businesses. With an allocated budget for cascade funding calls, start-ups and SMEs can apply for funding as third parties through an ongoing project's open call.

Additionally, these calls provide equity-free budgets ranging from €50,000 to €150,000 and come with technical assistance from industry experts who can help in proposal preparation and project execution to free access and support to use testing facilities. As such, they offer a gateway to the innovative European ecosystem and an increased chance of successful proposals due to their lesser-known nature.

Focus: Collaborative research

Unfortunately, the lack of collaboration among researchers from different disciplines has led to duplicated research efforts, missed opportunities for innovation, and a lack of demand for new textile structures. Researchers must work together to create synergies and generate new ideas to fully exploit the potential of textile-based materials and avoid duplication. Efforts should also be made to raise end-users' awareness of these materials' possibilities. The Horizon Europe Partnership is key in uniting the different research entities.

Focus: Synergies

The ERA industrial technology roadmap for circular technologies and business models in the textile, construction and energy-intensive industries will be implemented through the Partnership to create synergies with other initiatives. For example, the Made in Europe Partnership, the European Partnership Process4Planet, and the Circular Bio-based Europe Partnership will exchange and align strategic concepts, complementing it in various aspects, such as technological foresight, circularity, and decarbonisation. The Partnership will also engage with technology-focused and climate/circular-oriented initiatives such as the EU Climate Pact Ambassadorship and ensure synergies with the European Social Fund Plus.

Digital Innovation Hubs (DIHs) specialised in textiles will help companies become more competitive by providing access to technical expertise, experimentation, and innovation services needed for a successful digital transformation. In addition, the DIHs will act as one-stop shops to help companies test before investing and secure financing for their digital transformation.

The EIT Culture & Creativity Kic is an Innovation Community designed to strengthen and transform Europe's Cultural and Creative Sectors and Industries (CCSI) by increasing its innovation capacity and competitiveness. It takes a holistic approach to innovation and focuses on technology, business, artistic, and social innovation. While the Creative KIC embraces the textile ecosystem via the design aspect of fashion, the HEU partnership covers the whole sector with a focus on research and innovation.

The fashion and creative industries have the potential to link creativity and innovation in the new economy, but their contribution to Europe's re-industrialisation is often overlooked. The New European Bauhaus initiative aims to promote sustainable and inclusive living spaces and can play a crucial role in the potential European Partnership on Textiles to transform the textile industry to be more circular and less carbon-intensive. The New European Bauhaus Lab can contribute to the goals of STEP2030 by testing new tools, solutions, and policy recommendations.

Both initiatives aim to create sustainable and innovative solutions that enhance people's lives, and together they can accelerate the transition to a circular and carbon-neutral economy while promoting sustainable and inclusive living spaces.

Commitments

The European Partnership for Sustainable Textiles aims to promote sustainability in the textile industry by bringing together various stakeholders. EU industry associations like EURATEX, representing the textiles and clothing sector, will lead the Partnership in cooperation with other industry organisations. In addition, sectoral innovation clusters represented by EU-TEXTILE2030 will ensure the Partnership's impact at the SME level in regional industrial ecosystems across Europe, and European networks of RTOs and universities like the European Technology Platform for Textiles (Textiles ETP) will represent research and higher education communities. TEXTRANET is a network that joins a number of well positioned European institutions with world-class competencies involved in textile and clothing (T&C) related research and innovation activities which would be a crucial member of the partnership too.

Private sector stakeholders will provide in-kind and/or financial contributions to co-fund the R&I activities in line with the general financing rules of Horizon Europe. EU Member States with a special interest in the textile ecosystem can contribute to the partnership as well.

The Partnership will remain inclusive and aim to recruit new members, particularly to expand its R&I expertise. Its members commit to increase the sustainability of the textile industry through research and innovation, including developing new technologies, reducing the environmental impact of textile production and consumption, and improving working conditions throughout the supply chain.