

INNOVATION AS A CATALYST FOR CIRCULAR FASHION AND TEXTILES

Insights from the UK



ukft[®]

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- **Education:** MA in Sustainability & Corporate Social Responsibility; PhD in Circular Fashion.
- **Expertise:** Circular Fashion and Textile Systems, Fashion and Textile innovation.
- **Global Industry and Academic Projects:** Circular Supply Chains, Social Sustainability, and System Transformation.



Agenda

About UKFT

The UK Fashion & Textile Ecosystem

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Key takeaways and conclusion

About UKFT



About UKFT

UKFT is the **largest network for fashion and textiles in the UK**. As the industry's leading trade association and Sector Skills Body, we are committed to delivering sustainable growth for the entire fashion and textile supply chain.

We **bring together brands, designers, manufacturers, suppliers, retailers, end of life stakeholders, innovators, research and academia** to promote their businesses and our industry, both in the UK and throughout the world. We offer practical advice and technical support to help member companies grow and trade internationally.

With a **growing focus on sustainability and innovation**, UKFT is driving meaningful action in the transition to sustainability, with a focus on environmental impact reduction.

We work to elevate the skills of the UK fashion and textile industry to maintain our competitive position for the future.

We support businesses with complex global supply chains, as well as helping to drive a resilient and innovative UK manufacturing sector.

Our President is HRH The Princess Royal.

The UK Fashion & Textile Ecosystem



The UK Fashion & Textile Industry today

The UK fashion and textile industry is **one of the largest sectors** in the country and its influence extends around the world, generating significant socio-economic contributions across regional economies in the UK. The United Kingdom's fashion and textile industry is the **third largest in the world** after China and the United States.



£62 billion GVA

**Gross added value
contribution to GDP**



1.3 million jobs

**1 in every 25 jobs
in the UK**

The UK Fashion & Textile Industry today

**Growing of fibre
crops/farming**

**Fibres, textiles, leather
manufacturing**

**Fashion & textiles
product
manufacturing**

**Retail/wholesale of
fashion & textile
products**



UK consumer and post-consumer textiles (PCT)

We buy **more clothes per person in the UK** than any other country in Europe.

British consumers are each purchasing an average of 64 items annually.

19 kg of textiles consumed annually

36% less usage than 15 years ago



The UK Fashion & Textile Industry today



Trade

The UK fashion and textile industry **relies heavily on global supply chains.**

The UK imports large volumes of clothing, fabrics and raw materials from countries such as China, Bangladesh, India, Turkey and the EU, while exporting British-designed, luxury and specialist fashion and textiles to markets including the EU, USA, Japan, South Korea and China.

Currently, the UK is primarily exporting post-consumer textiles (both fashion and non-fashion), to be sorted and graded elsewhere.

3,264 kt

**Background &
Landscape:
The need for a
Circular Fashion and
Textile System**



The sustainable transition

- **From niche → mainstream:** Sustainability has shifted from a specialist concern to a core strategic priority.
- **From commitments → accountability:** Companies are moving beyond sustainability statements towards science-based targets, ESG reporting, certifications and measurable performance.
- **From products → circular systems:** Focus is expanding from “more sustainable materials” to design for durability, repair, reuse, recycling, resale and reduced waste.
- **From supply chains → transparency & traceability:** Greater scrutiny of where materials come from, how products are made and their environmental and social impacts is driving investment in data, traceability and supplier standards.
- **From voluntary action → regulation & market transformation:** Regulation, consumer expectations and investor pressure are increasingly embedding sustainability into how fashion is designed, produced, sold and disposed of.

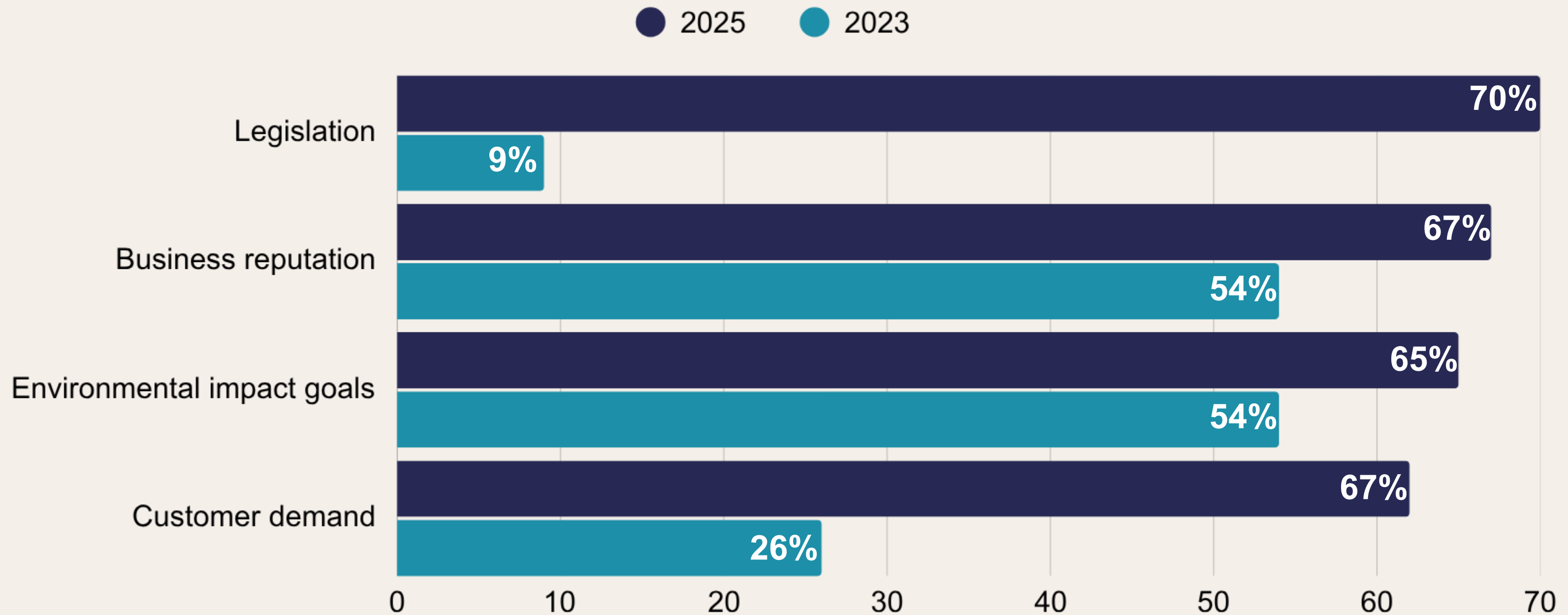


The regulatory landscape

- Ecodesign for Sustainable Products Regulation (ESPR) – introduces requirements around durability, repairability, recyclability, recycled content and environmental impacts; textiles are a priority product group.
- Digital Product Passport (DPP) – increasingly requires products to carry accessible information on materials, sustainability, repairability and recycling, with textiles targeted in the 2027–29 implementation window.
- Waste Framework Directive (revised 2025) – introduces Extended Producer Responsibility (EPR) for textiles and footwear, making producers contribute to the costs of collection, sorting, reuse and recycling.
- Greenwashing rules – EU measures are tightening requirements around environmental claims, making vague claims such as “eco” or “sustainable” harder to use without evidence.
- Unsold goods & waste – the ESPR introduces a ban on the destruction of unsold textiles and footwear for large companies, increasing pressure to manage overproduction and inventory differently.



UKFT Sustainability Survey – What is driving action



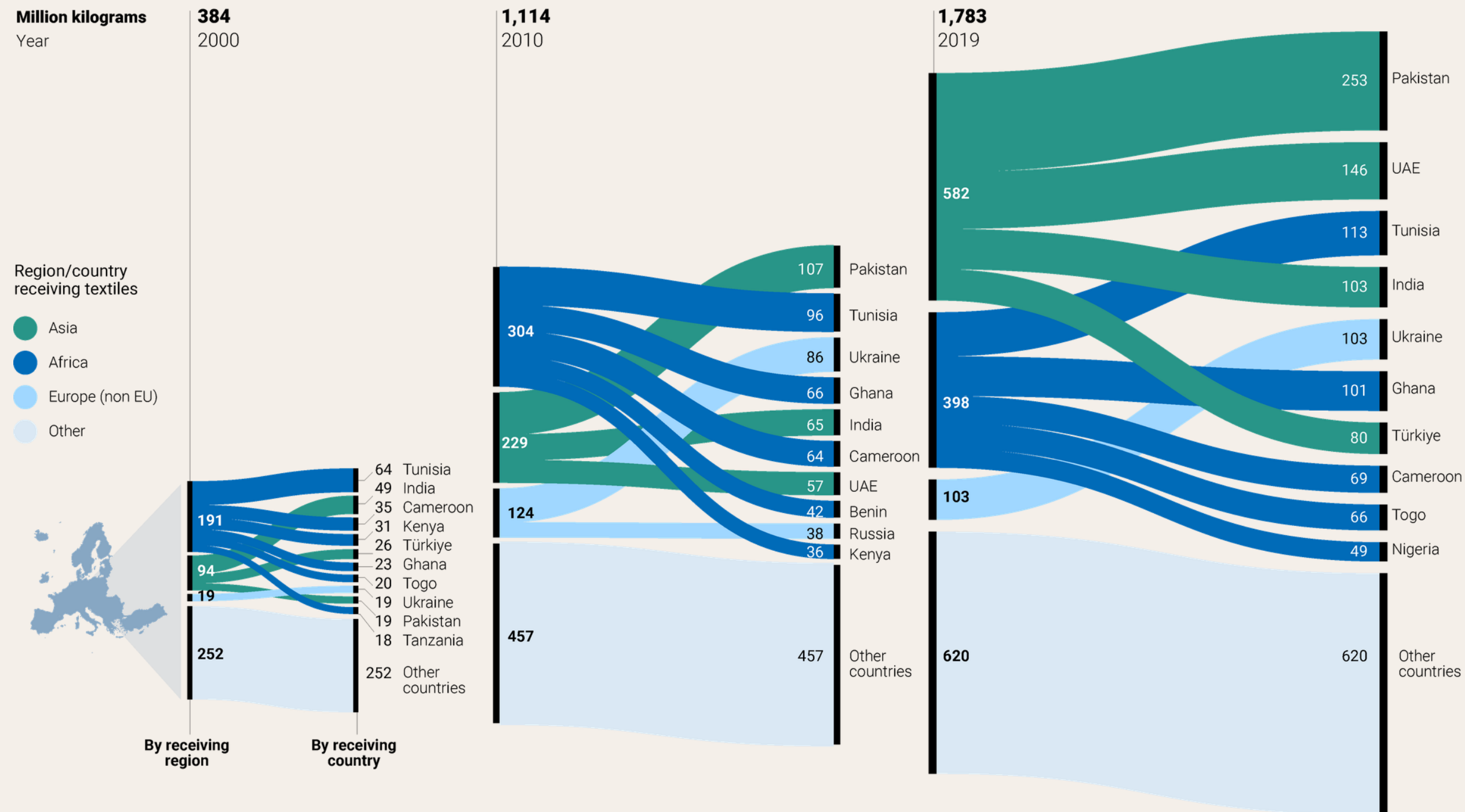
The unsustainable transition: environmental challenges

- Ecological and planetary crisis.
- Every year, the textile sector emits 2-8% of the world's greenhouse gases.
- 215 trillion litres of water consumed per year.
- 9% of annual microplastic losses to oceans.
- Sector dominated by fast, and ultra-fast speed.
- 92 million tonnes of textile waste yearly.

A sector struggling to address its impacts through significant natural resource use and pollution.

The linear logic

Fibre production, fashion and textile production, consumption and textile waste volumes continue to grow.



Mapping the Vision: What a Circular System Looks Like



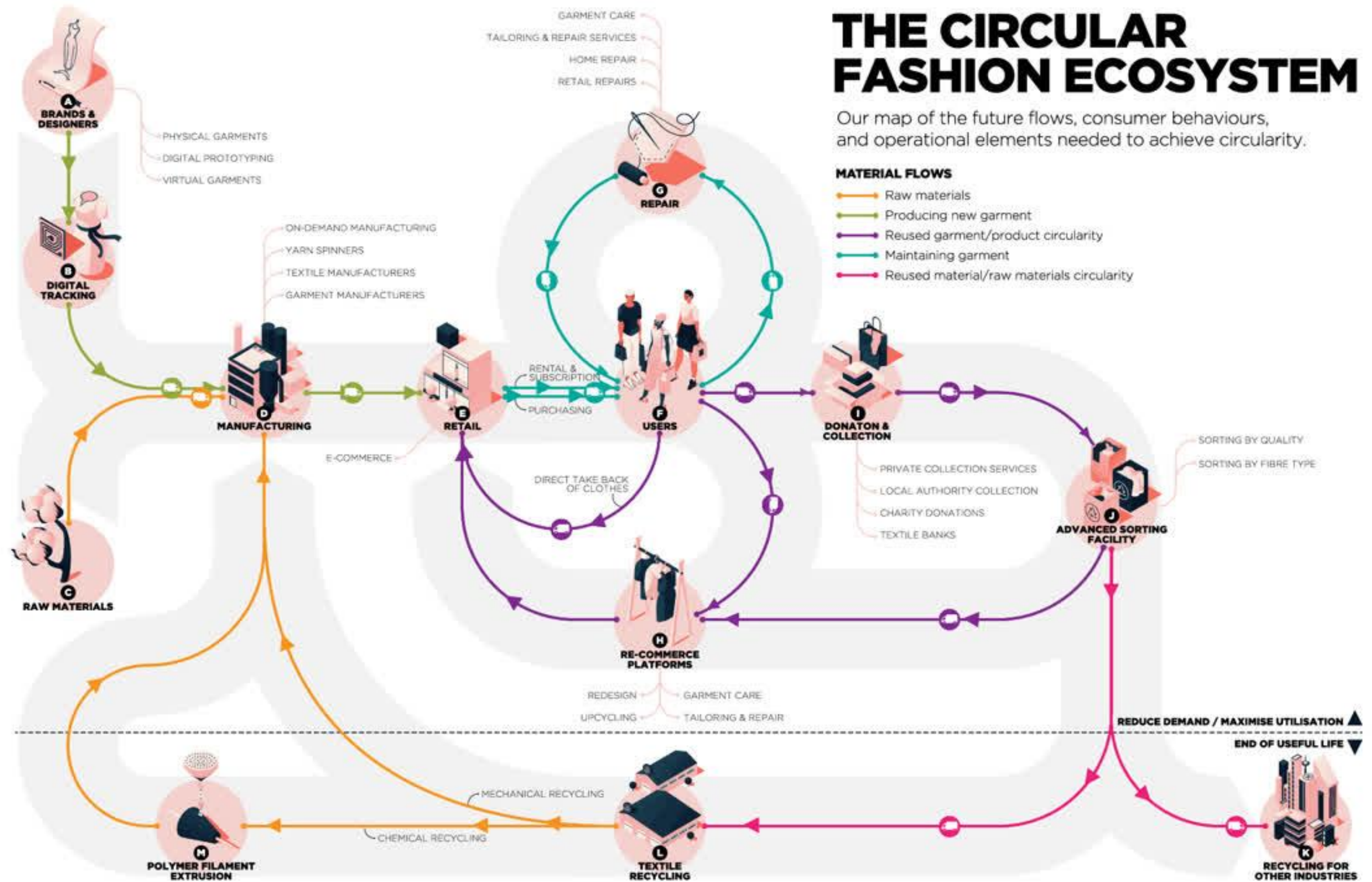


A circular economy in fashion and textiles represents an **alternative industrial paradigm** wherein products, materials, and resources are always kept at their highest utility and value.

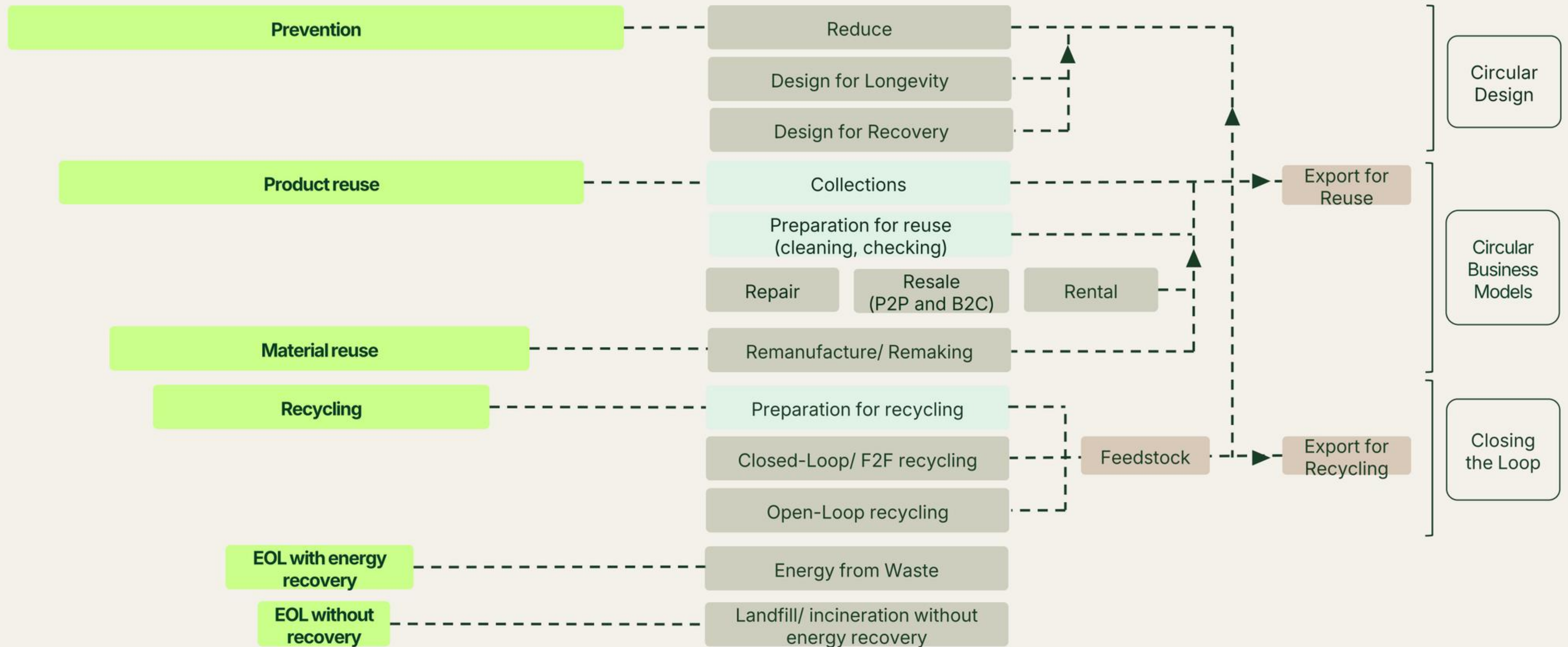
Textile circularity has emerged as a key focus area due to its direct impact on waste reduction and resource efficiency.

Circularity is particularly significant in addressing the fashion industry's reliance on virgin materials and its growing waste crisis.

While circular fashion and textiles represent a significant step toward sustainability, it primarily focuses on extending material lifespans rather than actively restoring ecological and social systems.



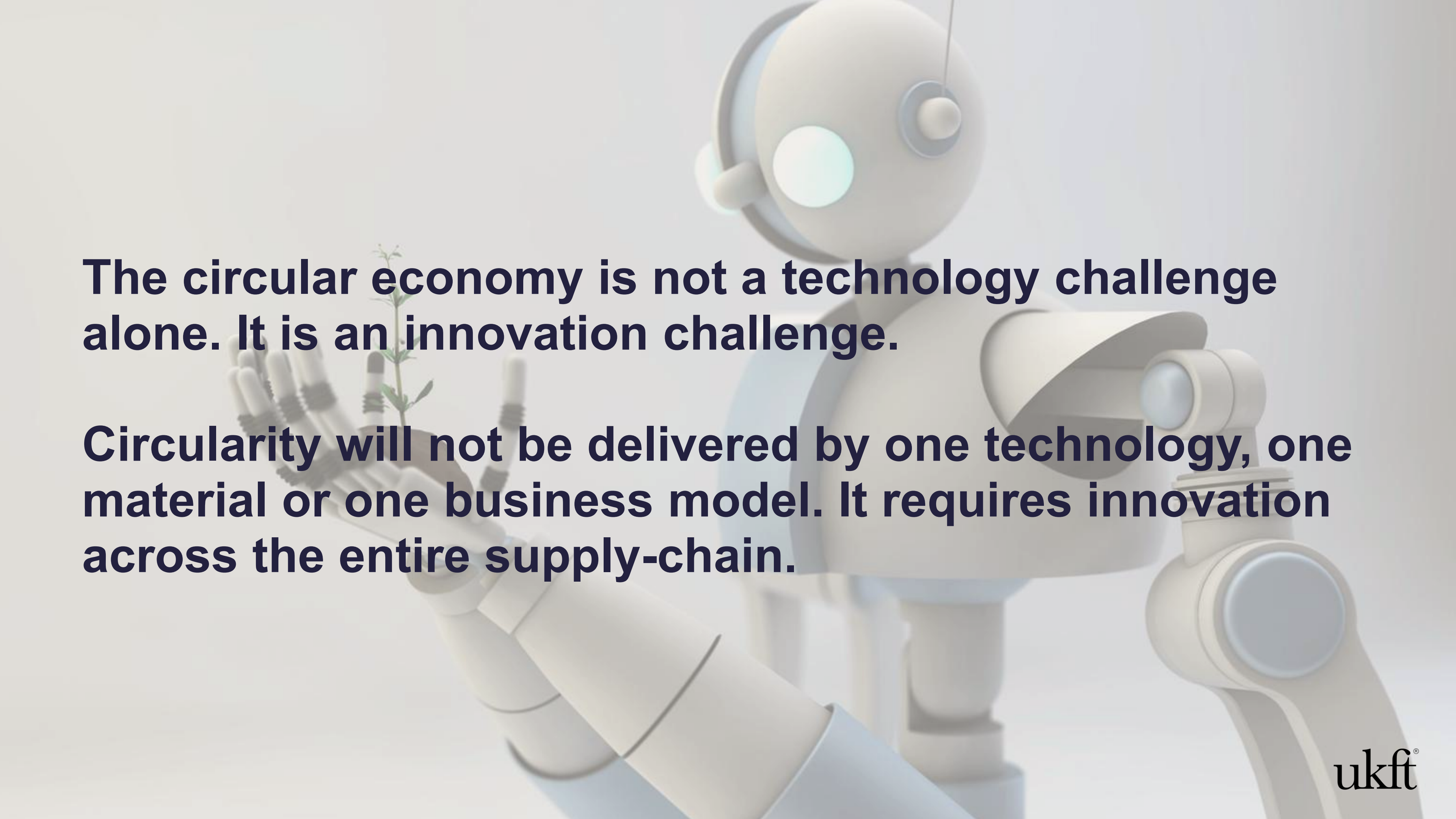
A circular hierarchy: protect value first



The conceptual appeal of circularity contrasts sharply with the operational reality of fashion and textiles.

The need for Transformation: Innovation as a catalyst





The circular economy is not a technology challenge alone. It is an innovation challenge.

Circularity will not be delivered by one technology, one material or one business model. It requires innovation across the entire supply-chain.

“Innovation is the process of transforming creative ideas into practical solutions, leading to **new or improved products, services, models and processes** that address specific needs or challenges. Innovation has the potential to unlock new opportunities, drive benefits and address complex challenges”.

Six innovation areas

MATERIALS

PROCESSING

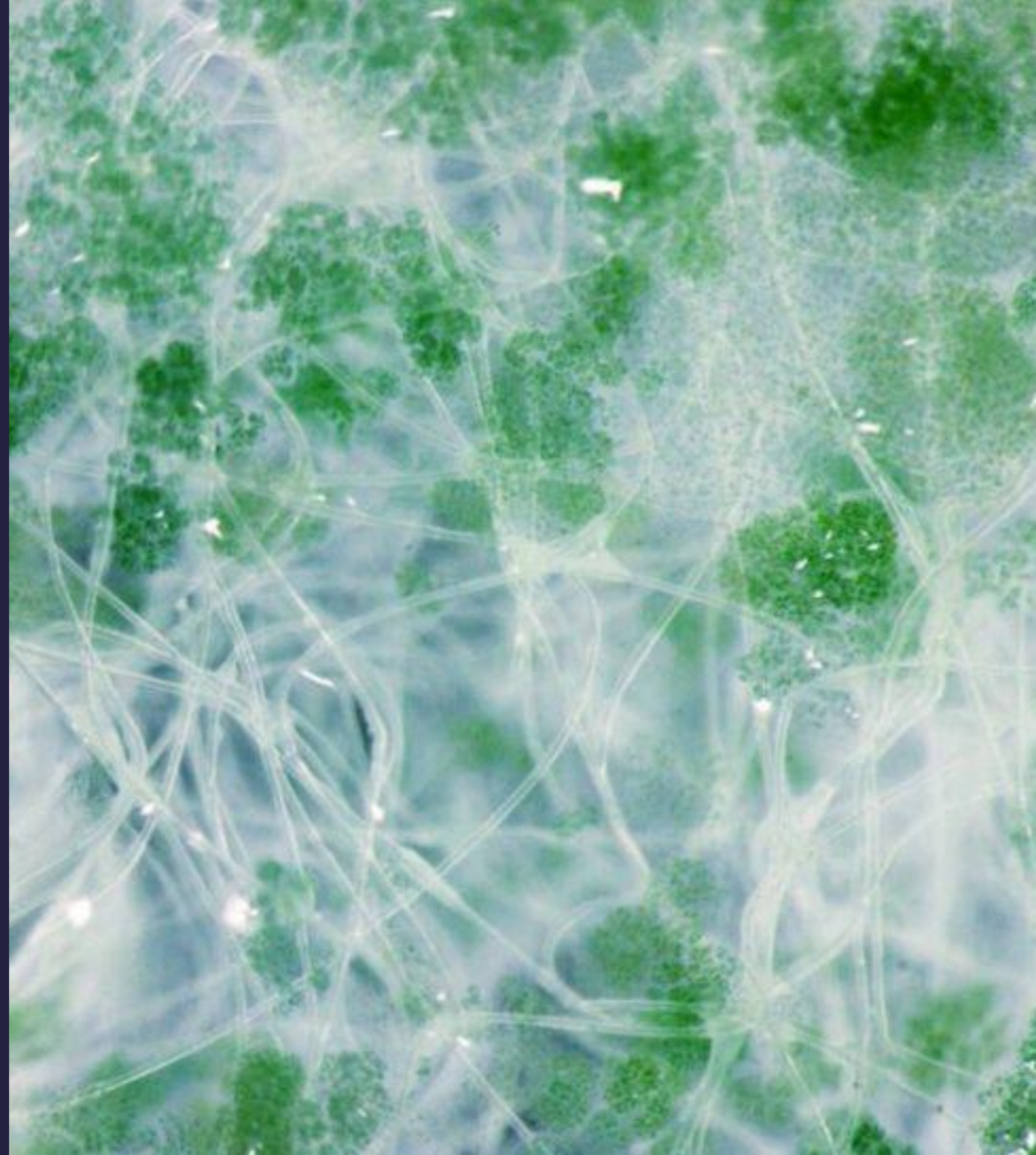
MANUFACTURING

BUSINESS MODELS

TECHNOLOGY

DIGITAL

Circular Innovation Spotlights: Insights from the UK



Why the UK

Because the UK is a useful test bed for circular fashion and textile system transition.

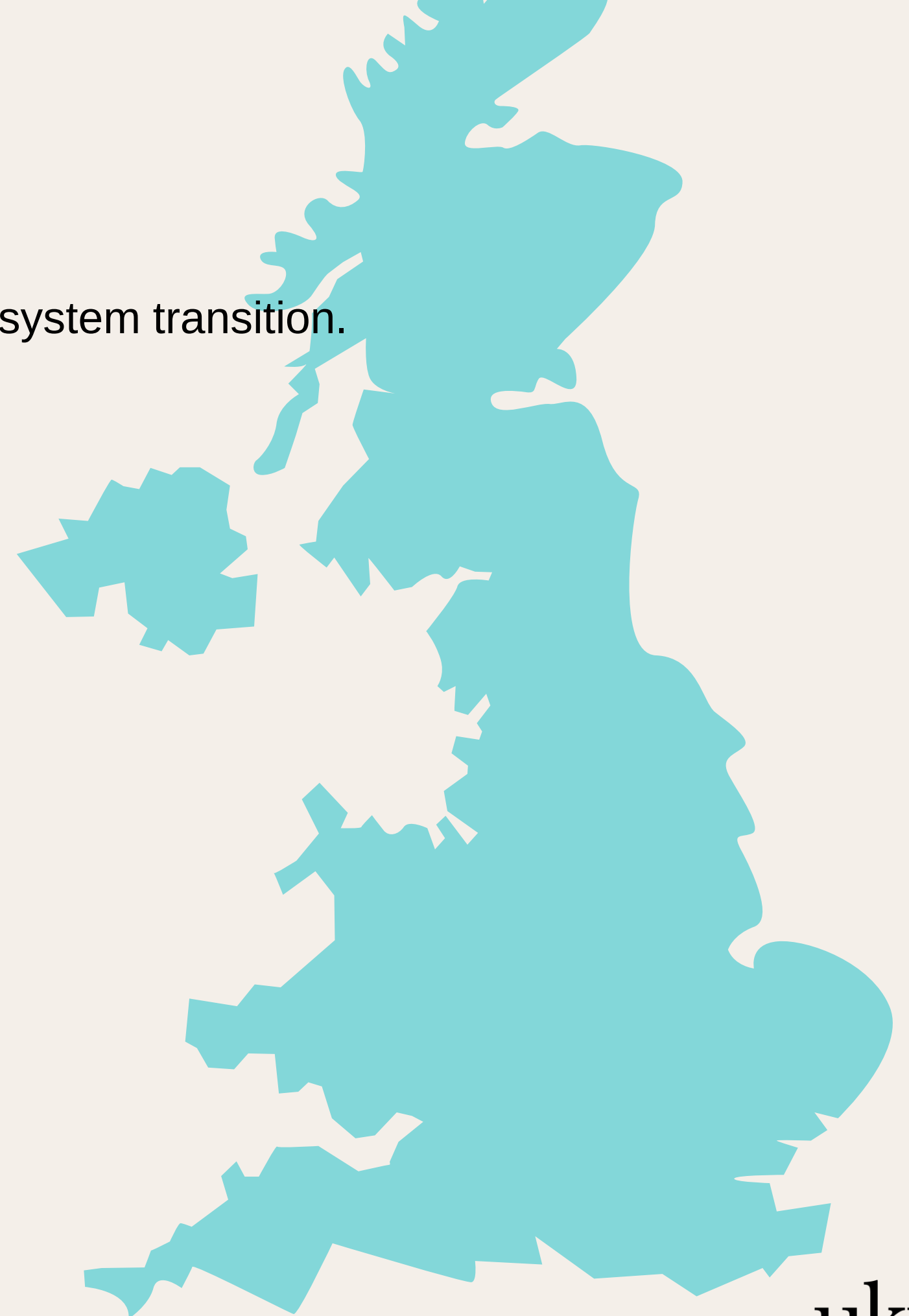
A strong creative economy

A diverse textile base

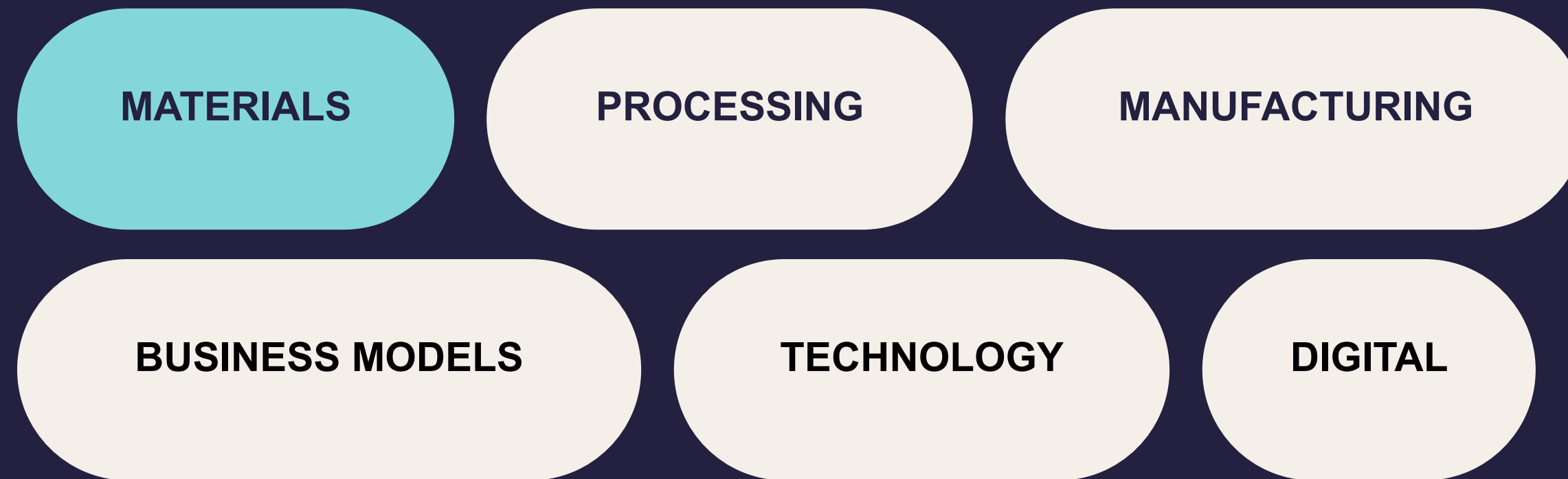
A live experiment

A system under pressure

A growing innovation ecosystem



Innovation area



What's next for circular materials?

Challenges

- Reliance on virgin and fossil-based fibres
- Blends make textiles hard to recycle
- Recycled fibres face quality and scale challenges
- Material choices can lock in end-of-life impacts

Opportunities

- Next-generation recycled fibres
- Bio-based & regenerative materials
- Waste-derived feedstocks
- Transition to regenerative agriculture and other sustainable cultivation practices



**Multiple solutions needed
to meet alternative
material demand and
performance.**

Innovation spotlight: Ponda



Ponda is a biomaterials company developing novel textiles from truly regenerative fibres. Ponda partners with farmers and conservation groups to regenerate carbon-emitting wetlands by cultivating *typha latifolia*, a plant well suited for rebuilding damaged wetland environments.

BioPuff® is an insulation designed to keep you warm whilst regenerating some of our most precious ecosystems. This next-generation insulation, which reduces reliance on feather and synthetic fillers, is created by extracting fibres from plants that aid in wetland regeneration.



Innovation spotlight: Arda biomaterials



Arda biomaterials are harnessing the power of plant proteins. Arda transform leftover grains from breweries into versatile polymers and materials for diverse sectors. They integrate technology seamlessly into local supply chains across the globe.

A collection of petri dishes containing various plant-based materials, including yellow granules, brown powders, and whole grains, arranged on a white background. The text "MATERIAL INNOVATION BACKED BY SCIENCE" is overlaid in the center.

**MATERIAL INNOVATION
BACKED BY SCIENCE**

Innovation spotlight: Rheon Labs

RHEON

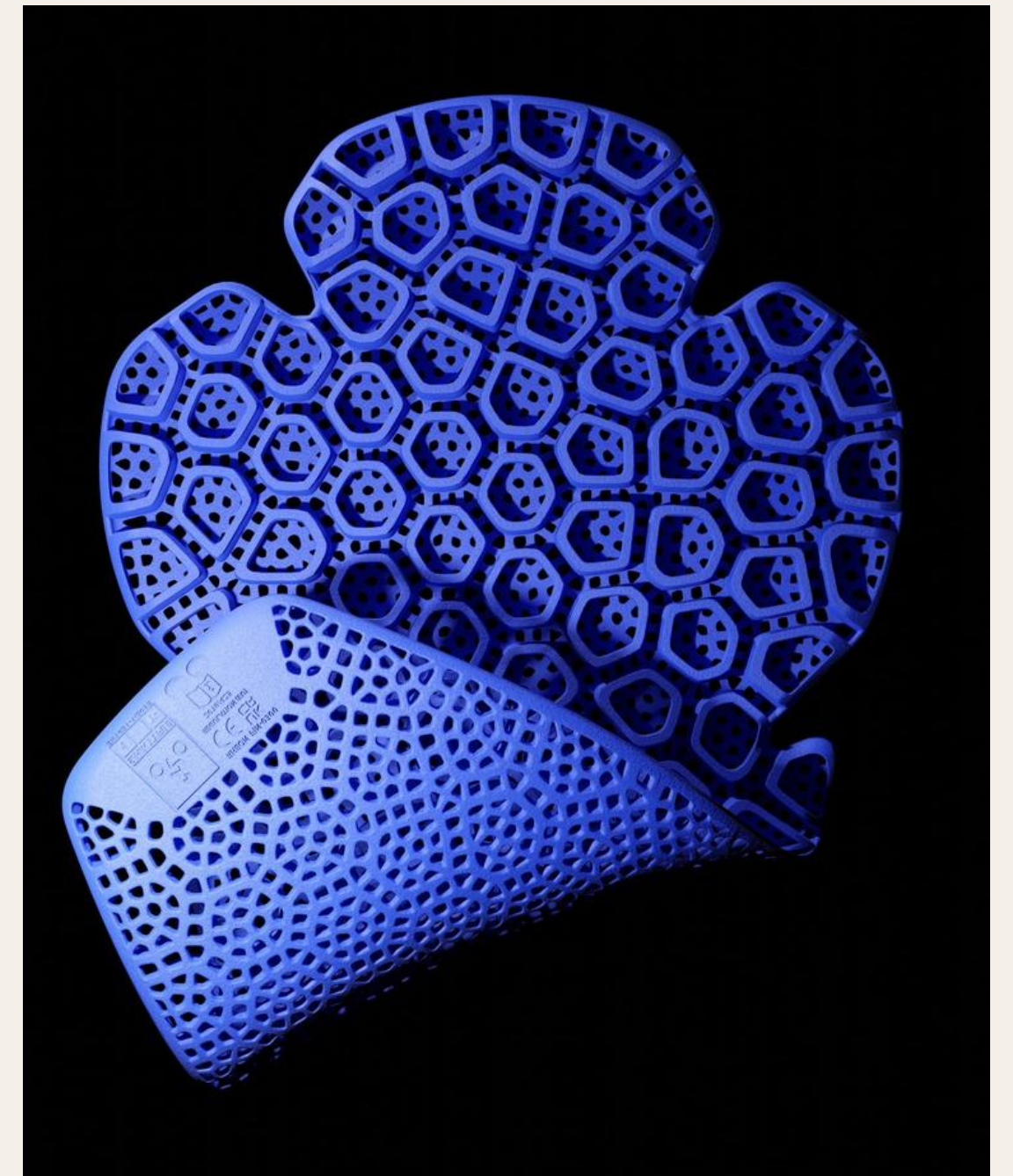
A new era of material performance.

At the core of RHEON™ technology is an energy-absorbing super polymer.

It is soft and flexible in its natural state but absorbs energy by stiffening when subjected to force.

When formed using our patented computational design techniques, RHEON™ is created into what is known as a metamaterial.

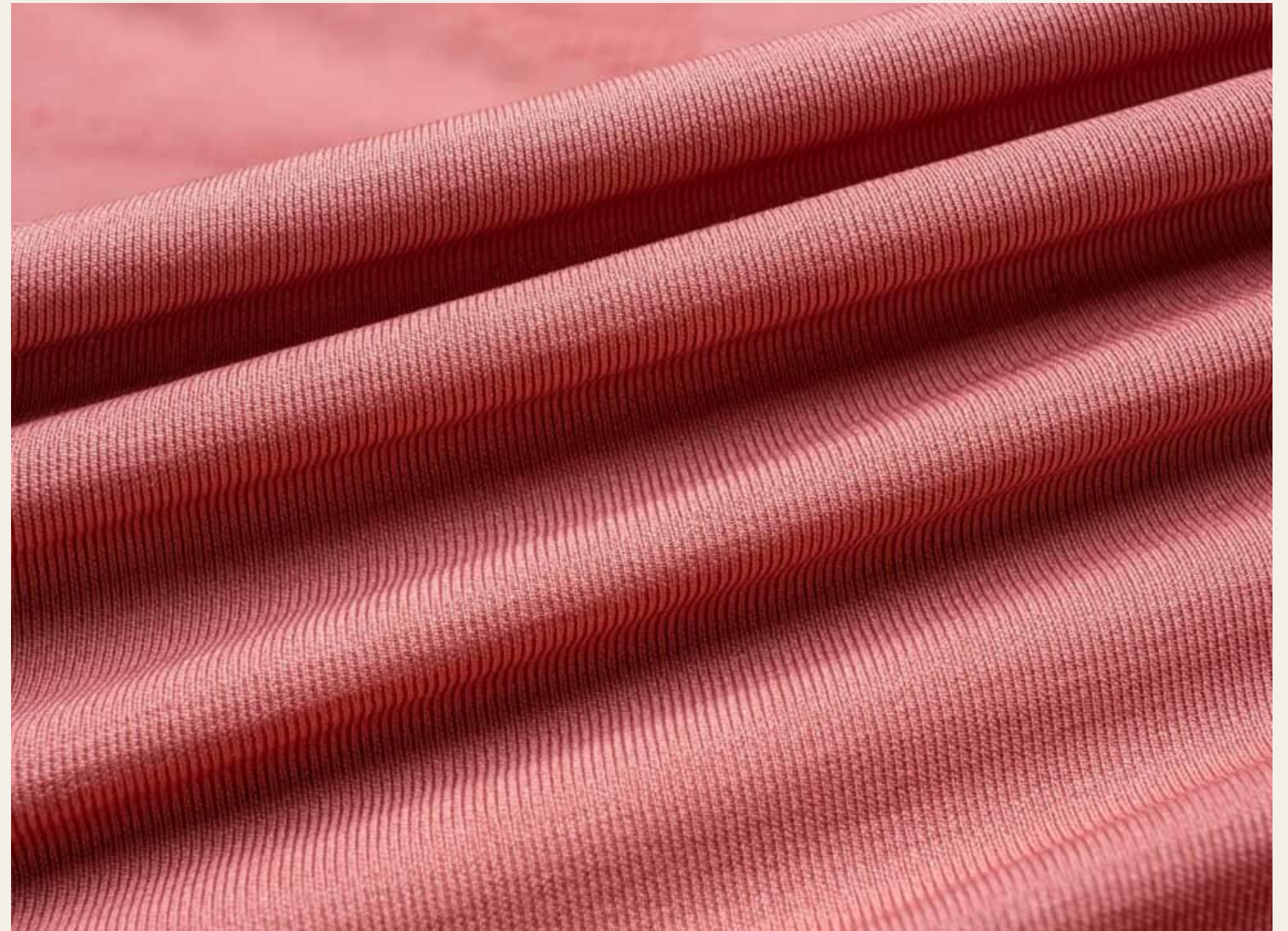
Delivering new properties that were previously thought impossible with conventional materials.



Innovation spotlight: Tera Mira



Tera Mira are developing a bio-based alternative to elastane made from seaweed. The company aims to deliver natural stretch without fossil fuels or microplastic pollution, while ensuring compatibility with existing textile machinery.



Innovation area

MATERIALS

PROCESSING

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What's next for circular processing?

Challenges

- High water, energy and chemical intensity
- Pollution and wastewater impacts
- Conventional processes can limit recyclability
- Recycling can require energy- and chemical-intensive processing

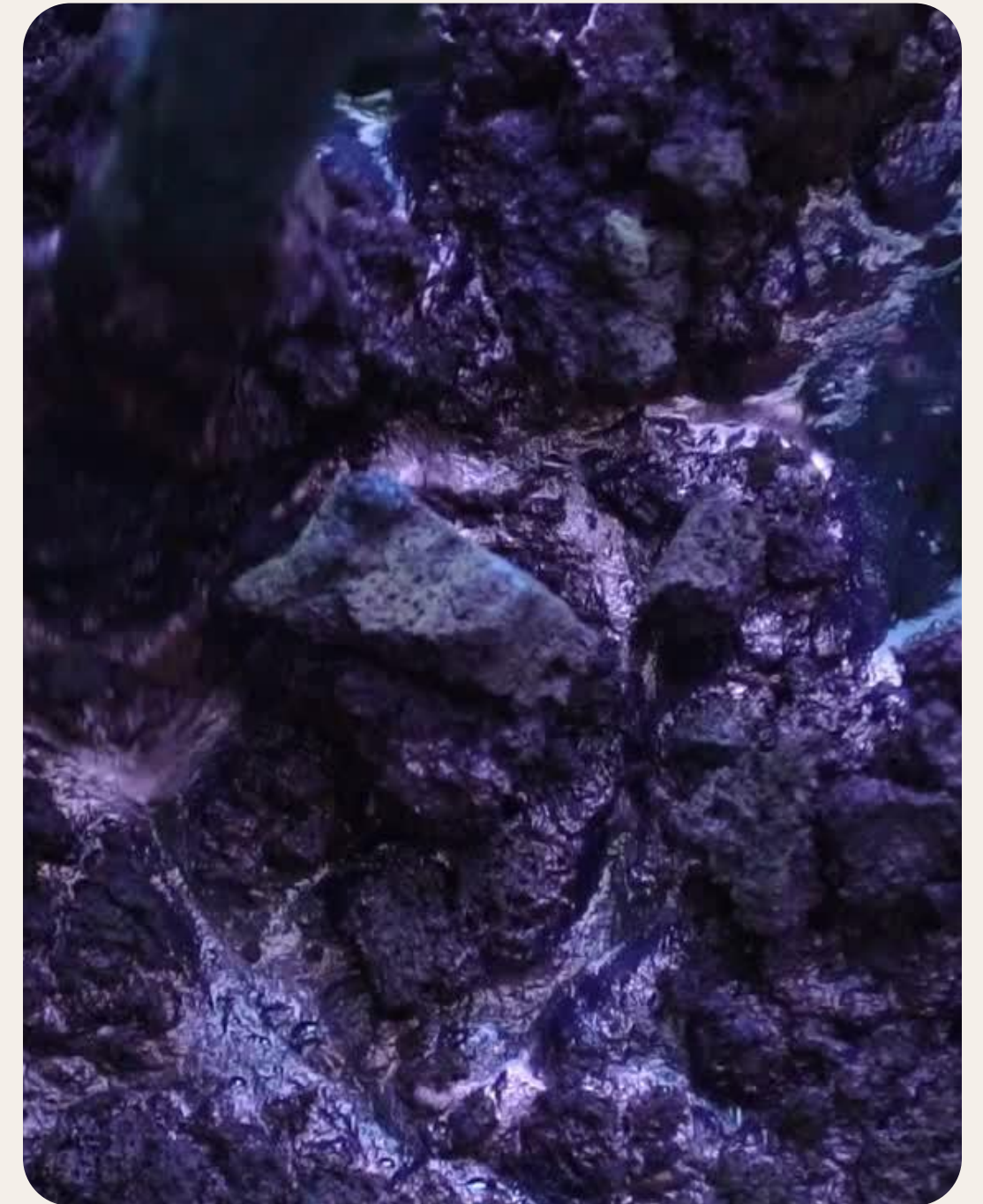
Opportunities

- Low-/zero-water processing
- Low-impact dyes & finishes (chemicals)
- Biotechnology & enzymes
- Digital printing
- Closed-loop water & chemical systems

Innovation spotlight: Dyerecycle



DyeRecycle is dedicated to leading the charge for **chemical circularity** in the fashion sector along with fibre circularity. DyeRecycle is the first-to-market technology to provide a chemical circularity concept in the textile industry. The process involves decolourising textile waste and reusing the extracted dyes. They offer recycled synthetic dyes as a product or circular dyeing using recycled dyes as a service. Their holistic approach simultaneously tackles two key challenges spanning the textile supply chain: the environmental harm from dyeing processes and the mounting problem of textile waste.



Innovation spotlight: Alchemie Technologies



They are delivering next-generation textile production processes that will be radically more efficient, less costly and more sustainable with their advanced digital manufacturing technologies. Endeavour is a breakthrough digital manufacturing process for textile dyeing. It delivers dramatic water and energy savings and enables you to deliver on-demand digital dyeing.

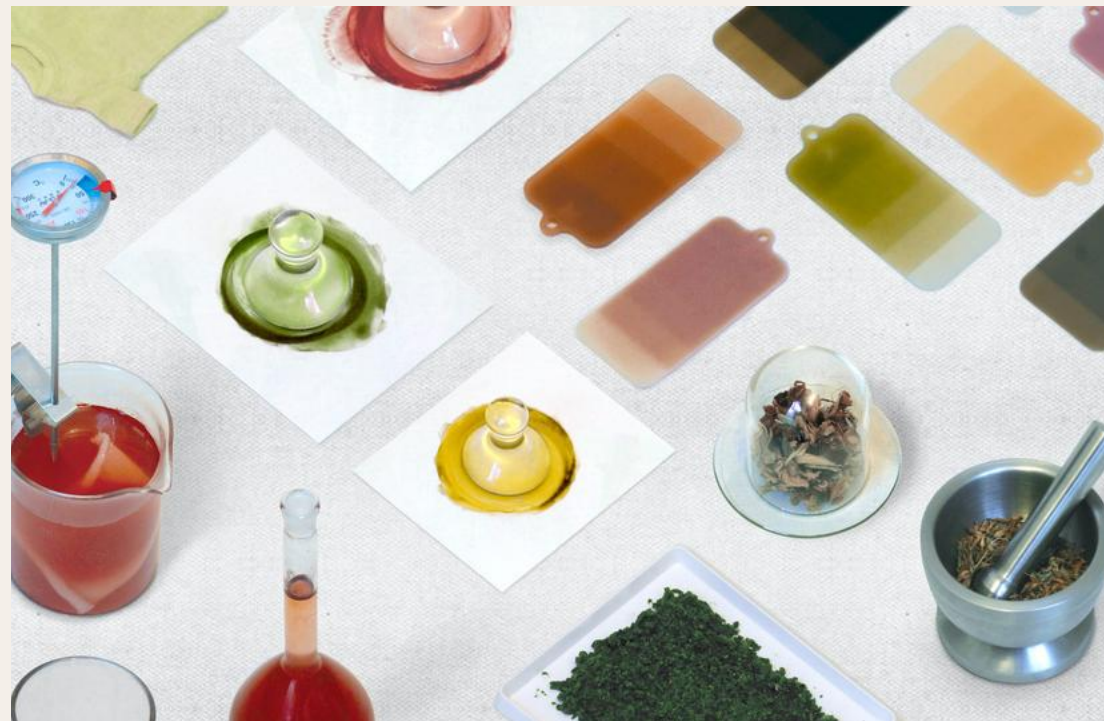


Innovation spotlight: Post Carbon Lab



Biotech company offering circular & regenerative microbial colouration and finishing services to textile and polymer supply chain.

Turn CO₂ into colours & finishes with microbes for industrial applications.



Innovation spotlight: Amphico



Creating responsible and accessible materials.

Coating and PFAS-free alternative to traditional waterproof breathable textiles, designed for circularity.

Inherently hydrophobic yarn needing no chemical coating to be water-repellent.



WE DON'T JUST TALK THE TALK.

We prevent our clients from having to make the difficult choice between high-performance and sustainability by offering the right choice for users and the planet.



REDUCE EMISSIONS

Reducing materials carbon footprint is what we do



NO TOXIC CHEMICALS

Always free from PFAS and PTFE



CIRCULAR SOLUTIONS

Mono-material solutions for a circular lifecycle



SAVE WATER

Waterless dyeing for a minimal freshwater footprint

Innovation spotlight: Danu water

DanuWater

Danu Water is a UK-based company delivering technology to treat industrial wastewater and make it ready for reuse onsite. Danu's technology removes salt and conductivity loads that conventional treatment can't touch — cutting discharge, easing water stress, and enabling closed-loop reuse across water-intensive industries. Even better - the hardware is small, low energy, and has no direct CO2 emissions.



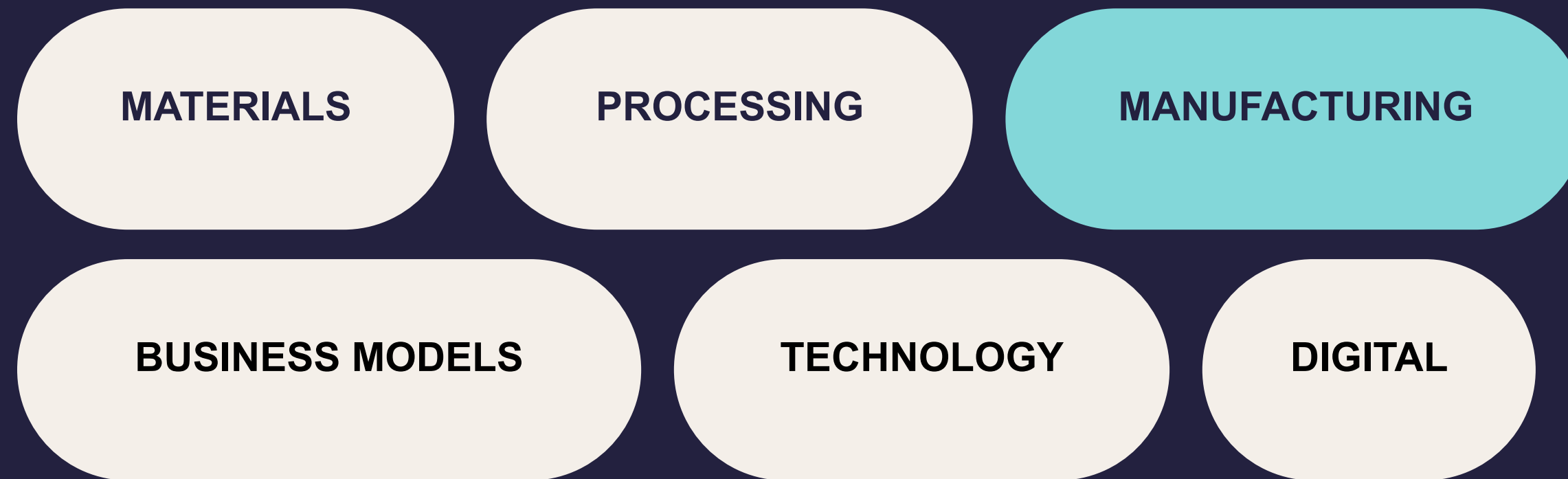
Innovation spotlight: Demeter Bio



Demeter Bio is a sustainable materials company developing AguaShield, a biodegradable bio-based coating that replaces forever chemicals (PFAS) in textiles. We combine biopolymer engineering and materials science to deliver high-performance water, oil, and alcohol repellent coatings without environmental persistence or regulatory liability.



Innovation area



What's next for circular manufacturing?

Challenges

- More than 70% of the emissions come from upstream activities, particularly energy-intensive raw material production, preparation and processing
- Low automation/efficiency
- Significant cutting and production waste
- Overproduction and excess inventory

Opportunities

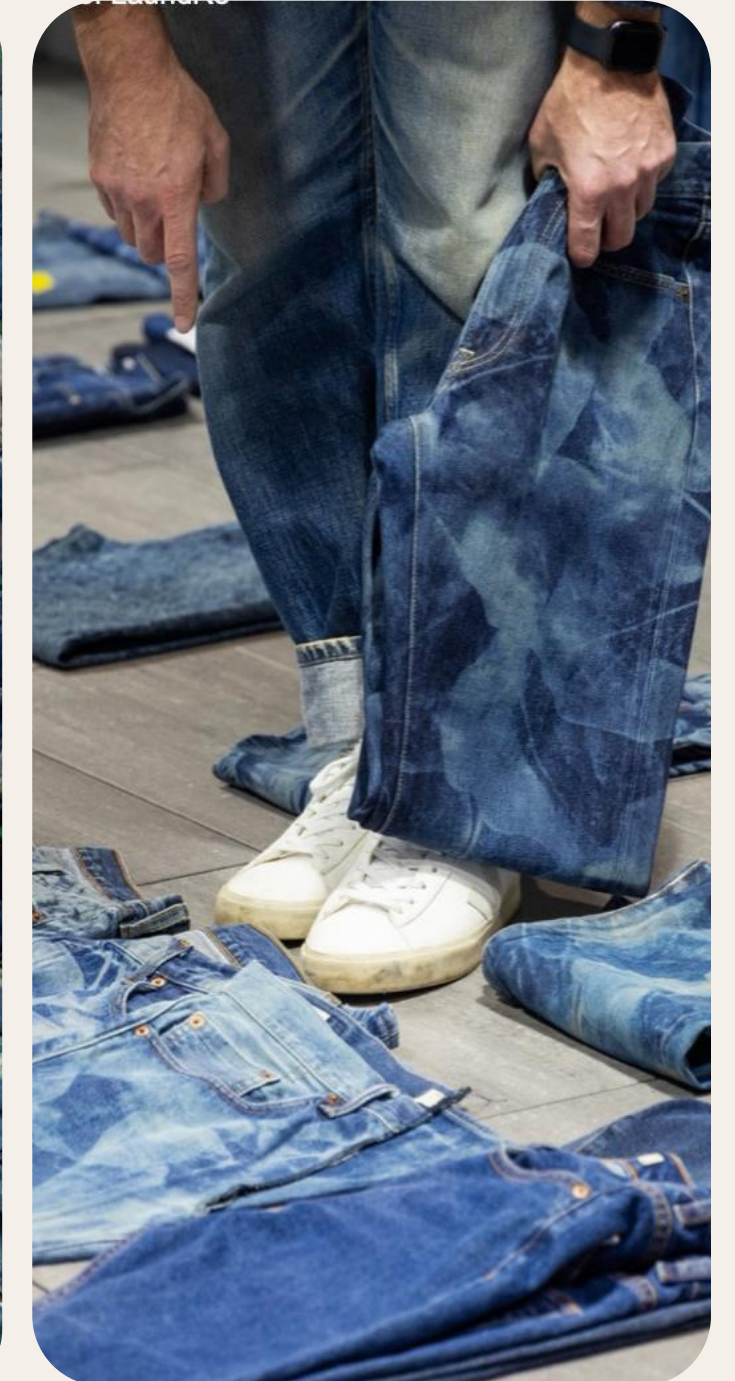
- Zero-waste design & cutting
- On-demand manufacturing
- 3D knitting & digital fabrication
- Automation & robotics
- Manufacturing for repair & remanufacturing

Innovation spotlight: LaundRE

LaundRe

LaundRe is the UK's first sustainable and circular denim finishing hub, dedicated to reshaping the fashion industry through innovative technology and a commitment to environmental sustainability. With a focus on local reprocessing and circularity, LaundRe aims to revolutionise denim production and minimise the industry's environmental footprint.

ReFinishing service: They provide a new circular solution helping brands to clear their inventories. Refinishing enables brands to sell unsold stocks as a new finished jean at full price, preventing the garment from being discarded.



Innovation spotlight: Weffan



Weffan's 3D whole garment weaving method reinvents garment manufacturing by merging textile and garment production into a single step, using existing onshore loom technology.

3D WEAVING THE FUTURE OF GARMENT PRODUCTION



Case study: Fashion Enter x United Repair Centre



Social impact organisations United Repair Centre and Fashion-Enter, have opened a United Repair Centre in London to make it easier for clothing brands and consumers to join the repair movement.

In partnership with the United Repair Centre, FEL offers repair B2B services.



Innovation area

MATERIALS

PROCESSING

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TECHNOLOGY

DIGITAL



What's next for circular business models?

Challenges

- Dominant make–sell–discard model
- Incentives favour volume over longevity
- Limited control after point of sale

Opportunities

- Post-retail responsibility
- Resale & recommerce
- Rental & subscription
- Repair & maintenance
- Take-back & trade-in
- Remanufacturing & refurbishment
- Made-to-order models

Circular Design

Foundation with room for growth

Repair

Strong in premium,
struggling in mass market

Resale

Promising but complex

Takeback

Volume opportunity,
infrastructure challenge

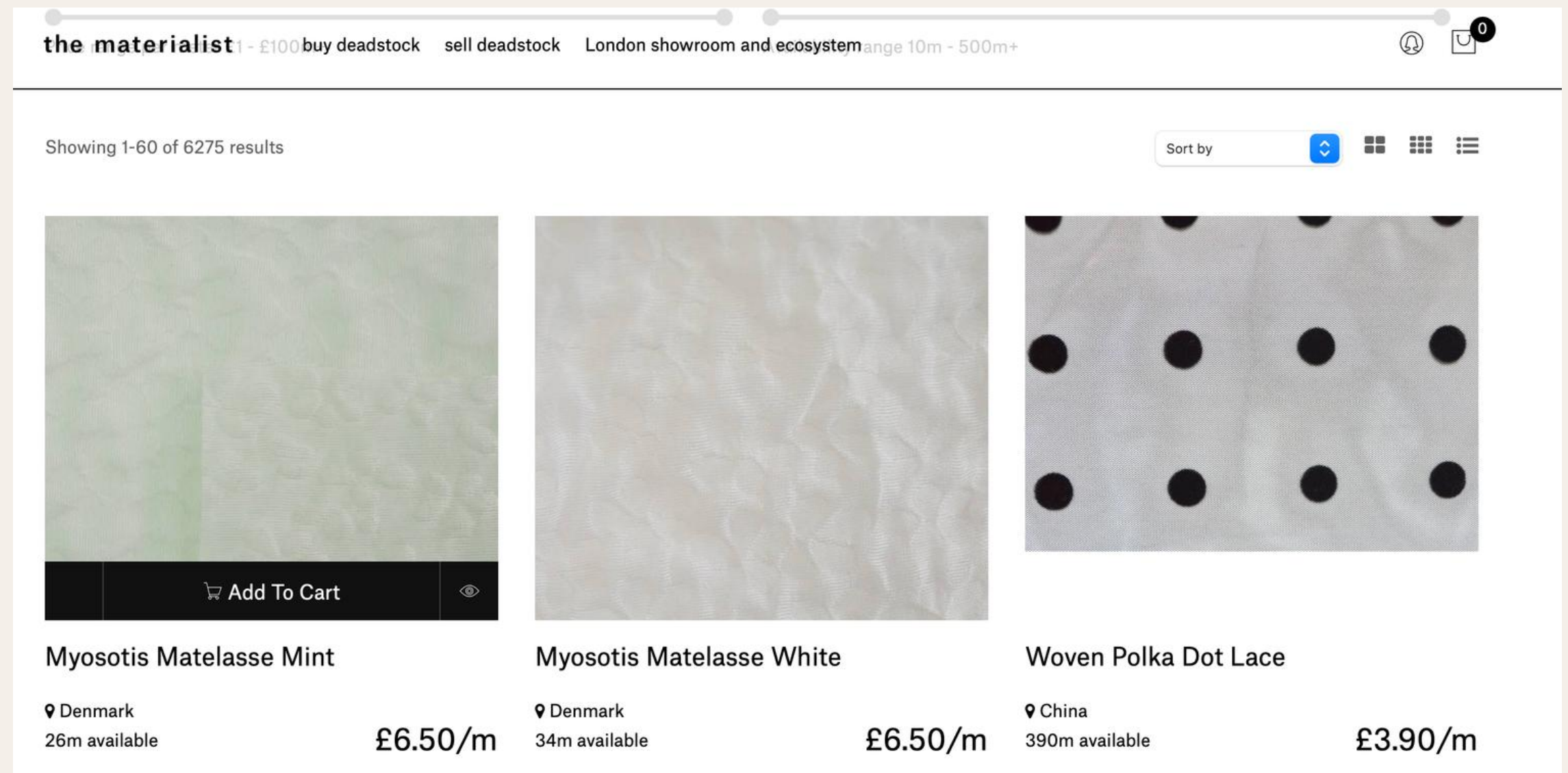
Rental and Remake

Emerging models with
niche applications

Innovation spotlight: The Materialist

the materialist

The materialist is a marketplace for deadstock fabrics that connects fashion houses, designers and other visionaries with high-end suppliers' excess inventories. the materialist inspires and accelerates a new ecosystem for circular textiles and materials.



Innovation spotlight: Reskinned

RE_SKINNED™

Reskinned are linking up existing solutions with new tech ideas to create more options for people and brands to rehome unwanted clothes. Through resale, repair and innovative recycling, they are realising a more sustainable fashion future.



Innovation spotlight: Loanhood

LOANHOOD

Creating positive change through sustainable experiences, inspired by the movement towards more sustainable consumption.

**150+
SUSTAINABLE
FASHION
EVENTS**

27,270

**ITEMS SWAPPED
AND REHOMED** 



**SELFRIDGES OPENS
UK'S FIRST IN STORE
SWAP SHOP BY
LOANHOOD**

[Read more](#)

Innovation area

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What's next for circular technology? A focus on sorting and recycling

Challenges

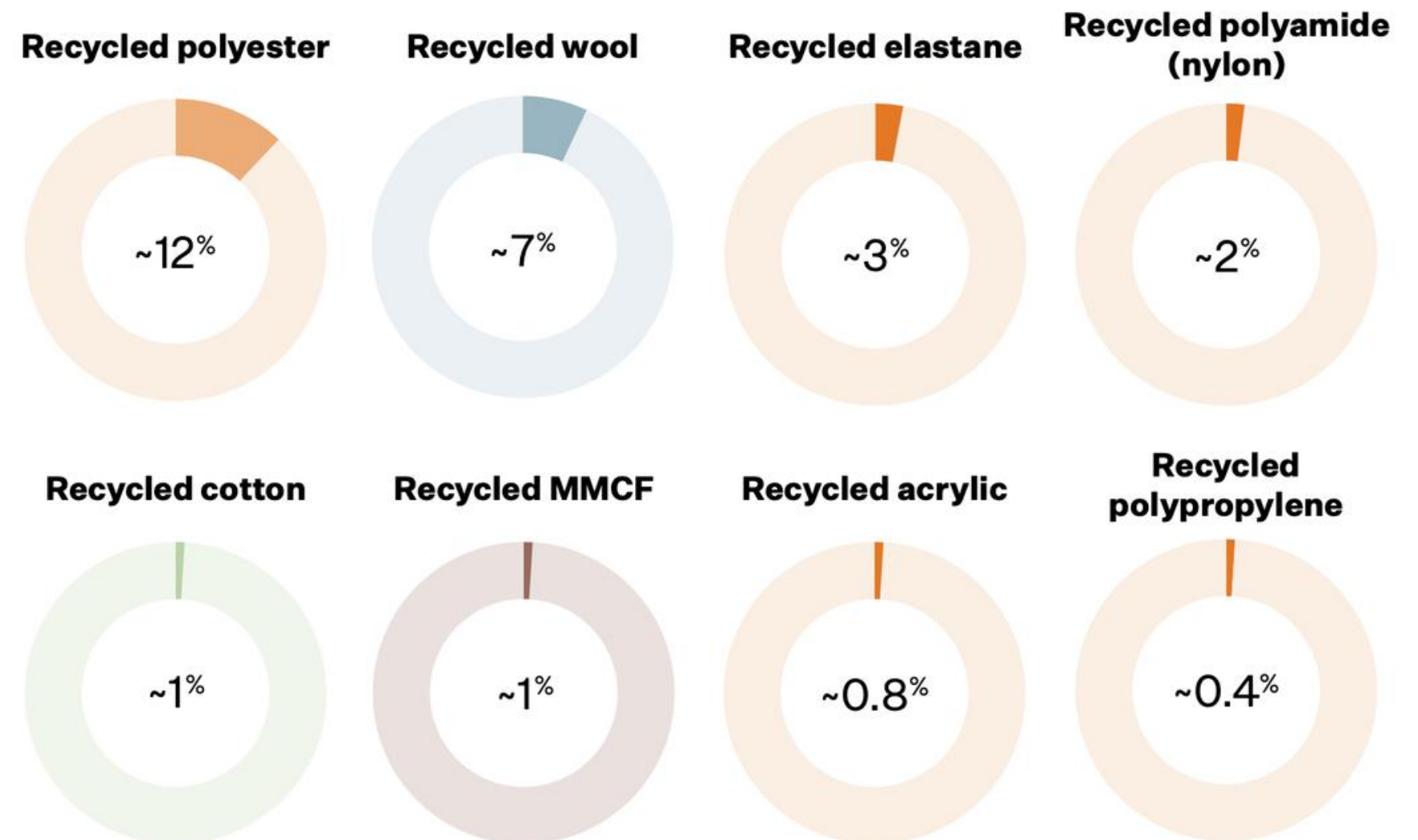
- Textiles are difficult to identify and sort at scale
- Fibre blends make separation and recycling challenging
- Current recycling can reduce fibre quality
- Many technologies remain costly, energy-intensive or low-scale
- Limited infrastructure for high-value textile-to-textile recycling

Opportunities

- AI & automated textile sorting
- Near-infrared / hyperspectral identification
- Automated fibre & blend separation
- Mechanical & chemical recycling
- Fibre-to-fibre recycling technologies
- Depolymerisation & polymer regeneration
- Recycling technologies for blended textiles

**Globally, less than
1% of textiles are
recycled.**

Market share of recycled within each fiber category in 2024



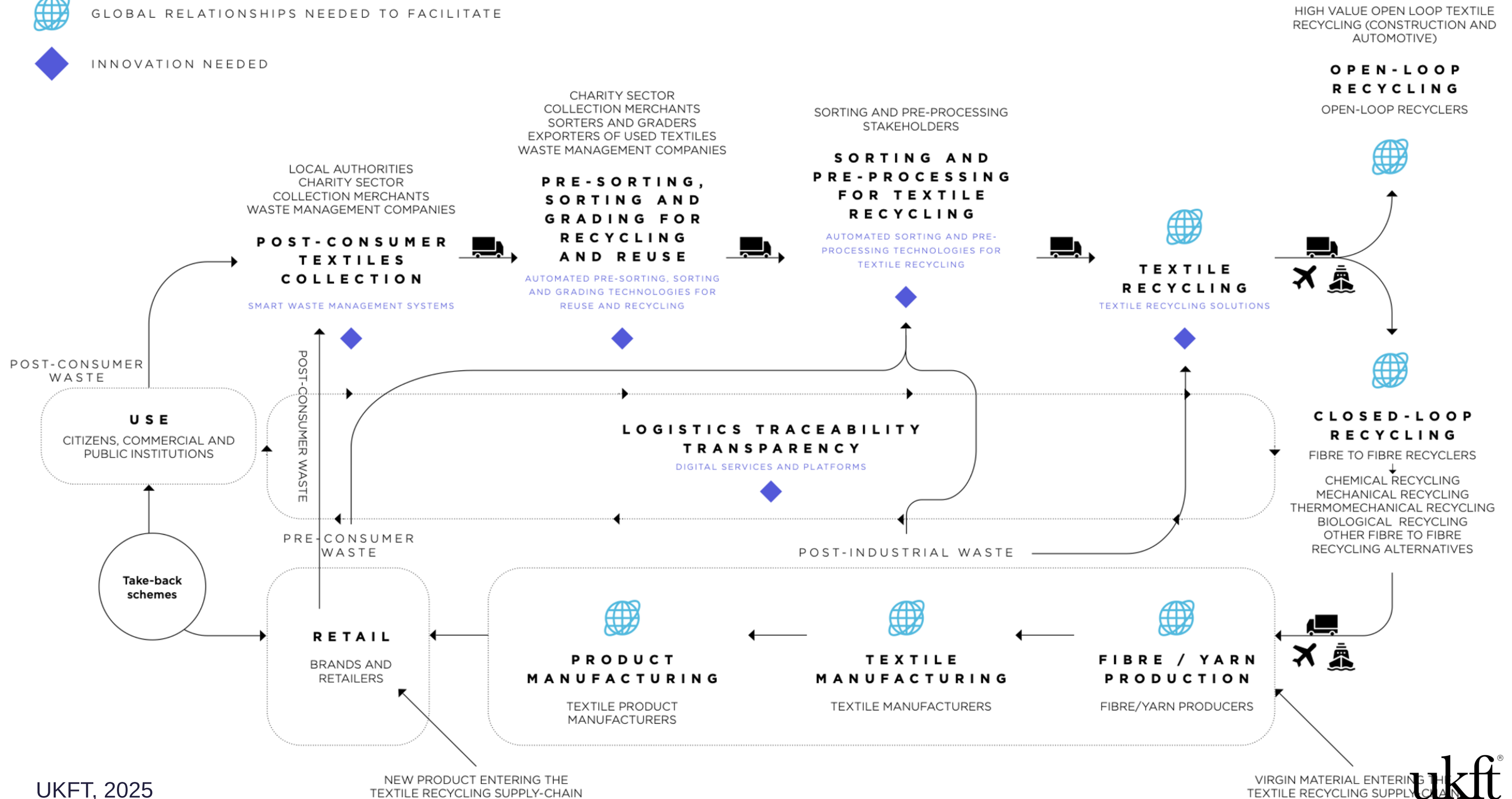
Source: Textile Exchange based on Maia Research and global data compilation.



GLOBAL RELATIONSHIPS NEEDED TO FACILITATE



INNOVATION NEEDED



Innovation spotlight: Matoha

Matoha

Matoha has created affordable and portable plastics and fabrics identifier machines to enable the circular economy.

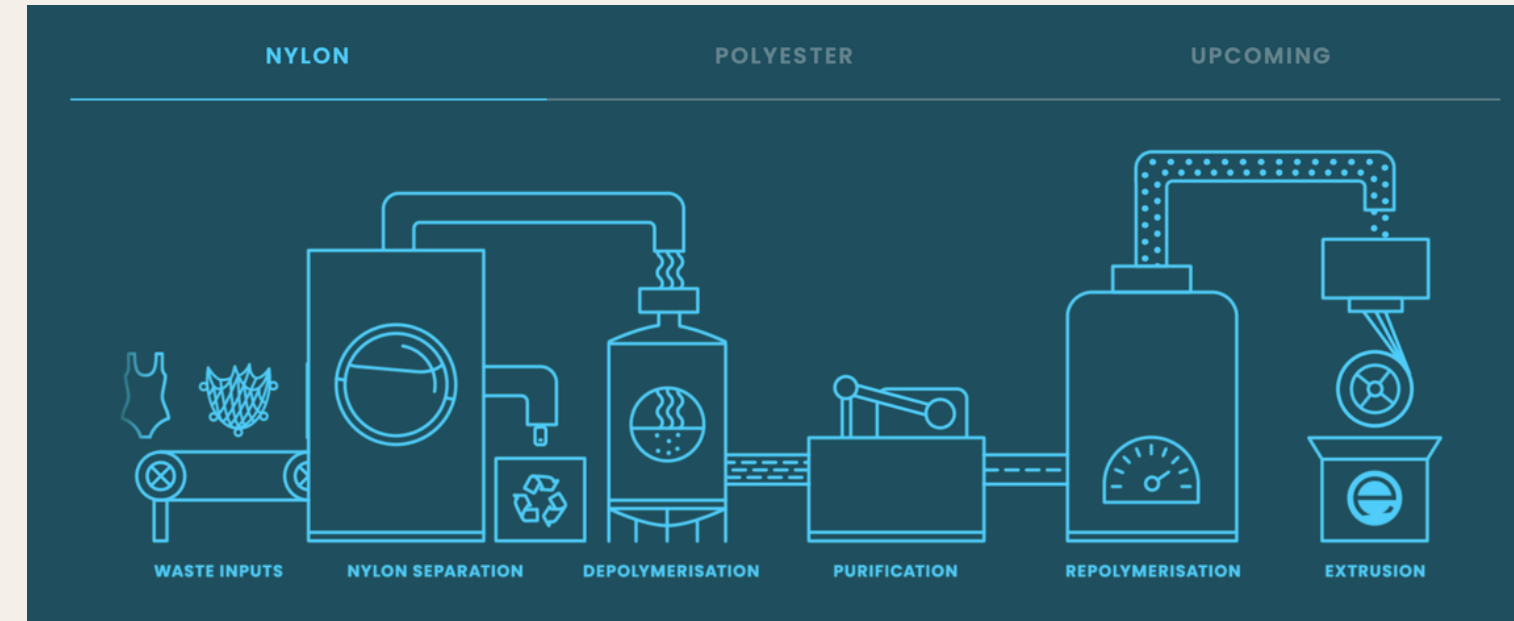


Innovation spotlight: Epoch biodesign



Epoch's biorecycling platform unlocks circularity for the toughest to recycle materials. Their AI-designed enzymes enable infinite recycling for mixed plastics and textiles at low temperatures.

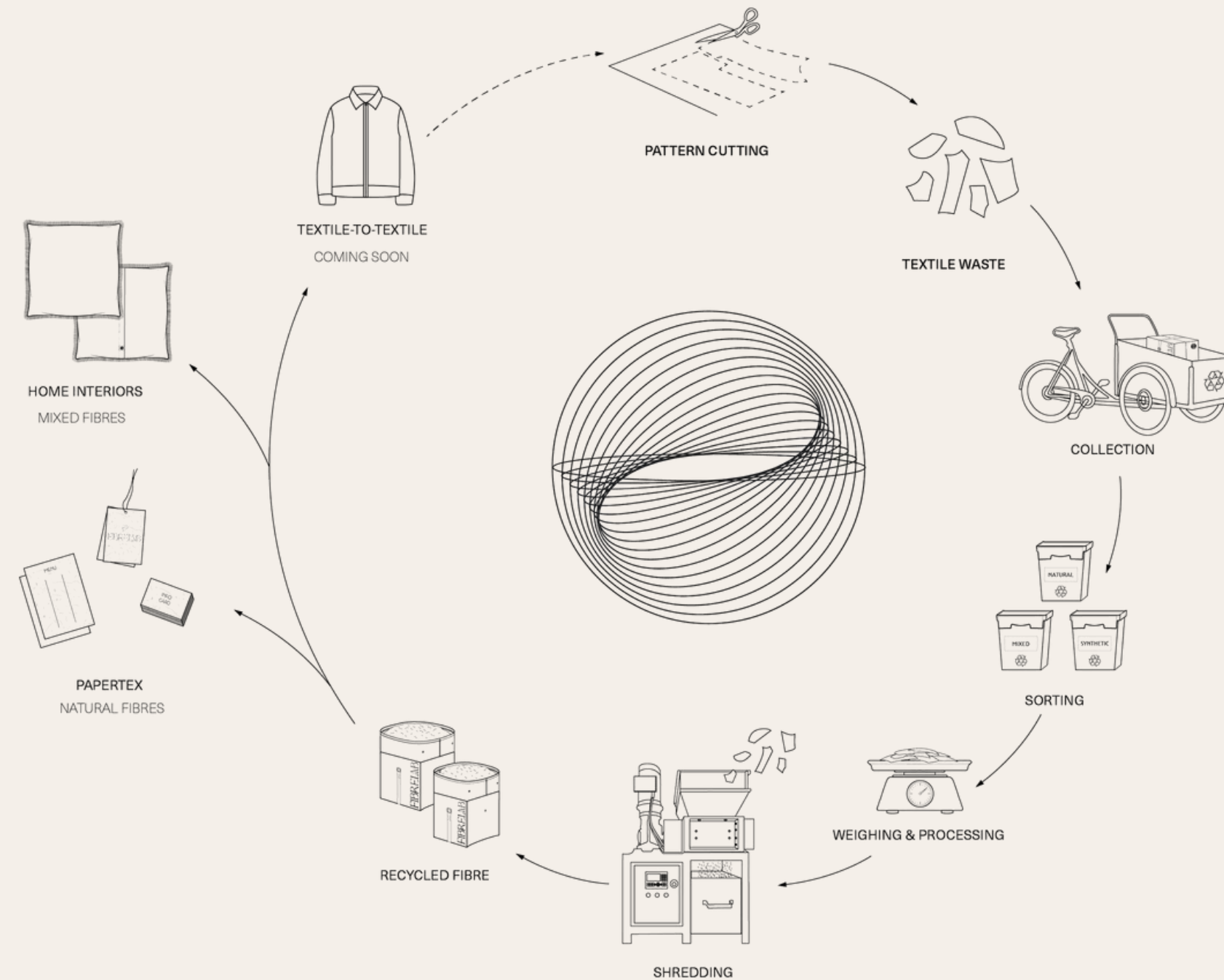
**Transforming
unrecyclable waste
into climate-friendly
products.**



Innovation spotlight: Fibrelab

FIBRELAB

FibreLab operates as a hyper-local textile recycling and shredding service. A custom-built mechanical shredding machine is used to process pre-consumer and post-industrial textile waste into valuable recycled fibres.



Innovation area

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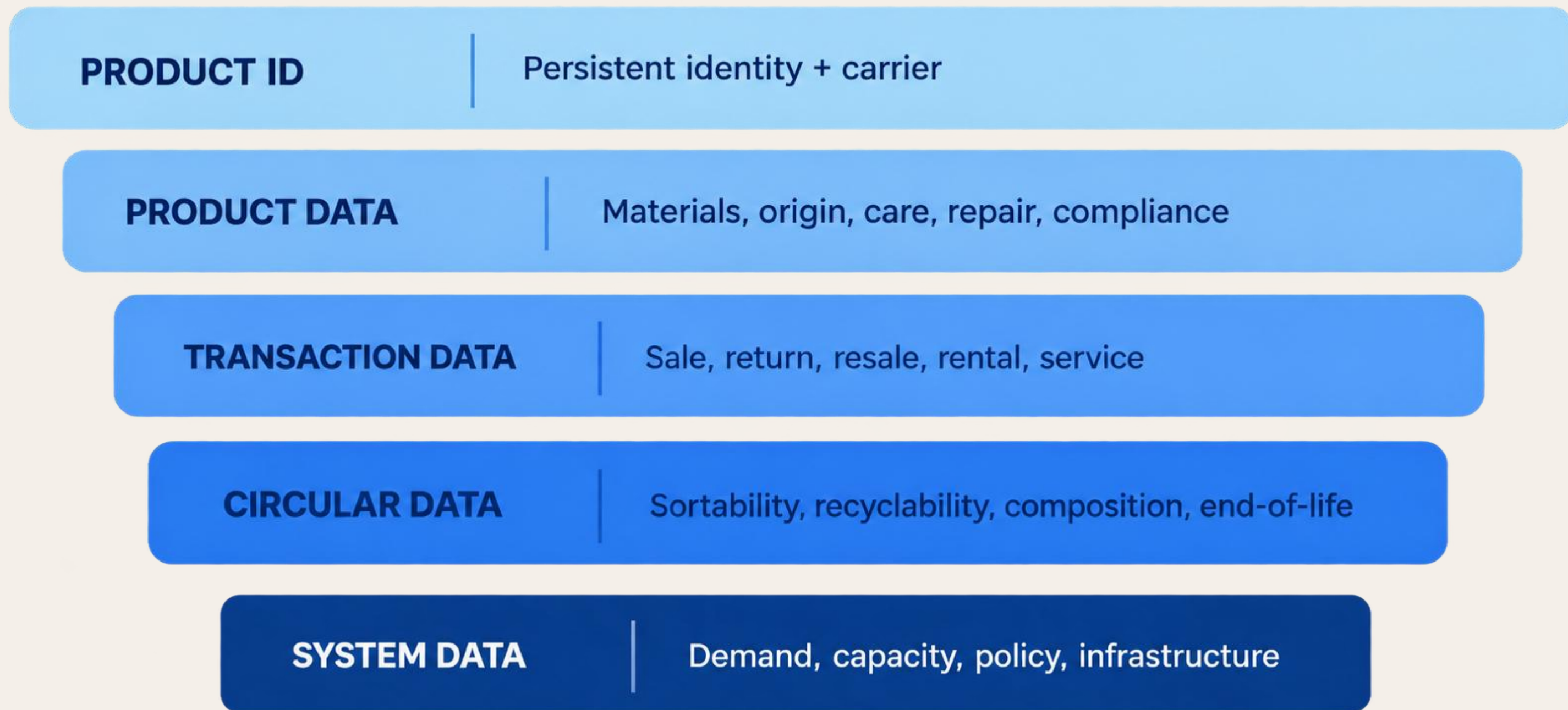
Digital transformation

In today's fast-paced, technology-driven world, **digital transformation has become a vital aspect.**

Digital transformation: the impact of digital technologies and **data** and their use on existing and new activities – is accelerating worldwide, affecting all sectors.

Fashion & Textile Industry Digital Transformation is critical for fostering a more informed, adaptive, technologically advanced and sustainable industry.

The DT plays a foundational role in ensuring resilience.



Successful implementation of circular strategies depends on the availability of robust digital infrastructures.

The test is interoperability. Digital circularity is successful when the physical system gets better because the data is connected.

Open

Trusted

Actionable

Useful

Key Digital Technologies

for a Smarter, More Sustainable Fashion & Textile Industry

TRANSPARENCY / EFFICIENCY / CIRCULARITY / INNOVATION



Digital Product Passports (DPPs)

Provide comprehensive, digital information about a product's origin, materials, lifecycle and environmental impact.



QR Codes and NFC Tags

Enable quick access to product information, authentication and interactive experiences via smartphones or scanners.



Blockchain Technology

Creates secure, transparent and tamper-proof records for traceability, provenance and trusted data sharing.



3D Design and Virtual Prototyping

Accelerates product development, reduces physical samples and enables virtual testing and collaboration.



Artificial Intelligence (AI) and Machine Learning

Analyzes data, predicts trends, optimizes processes and improves quality, fit and demand forecasting.



Automated Fiber-to-Fiber Sorting and Optical Recognition

Uses computer vision and automation to identify and separate fibers for high-quality recycling and reuse.



On-Demand and Zero-Waste Manufacturing Software

Optimizes production, matches demand in real time and minimizes waste through smart planning and digital workflows.



Internet of Things (IoT) Connected Apparel

Tracks usage, care and performance in real time, enabling better customer experiences and circular lifecycle management.



RFID Tracking Systems

Monitors products across the supply chain, improves inventory accuracy and enhances traceability and security.



Digital Twin Technology

Creates a virtual replica of physical products, processes or systems to simulate performance, optimize decisions and extend product life cycles.

Innovation spotlight: Solena



Through AI based deep learning models they design new proteins, enabling the development of fibres that are high performance, non-oil derived and biodegradable.

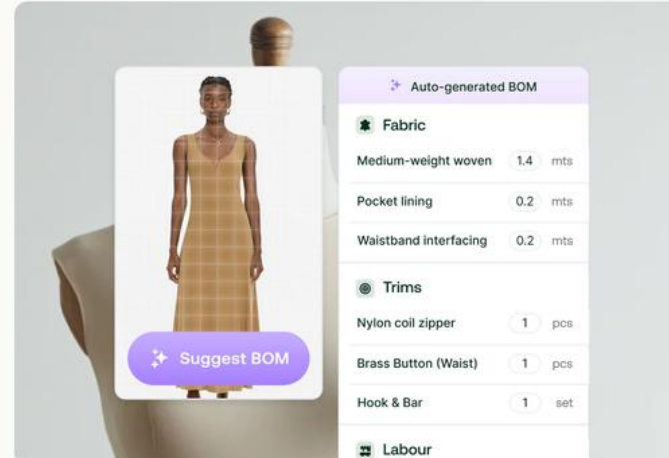


Innovation spotlight: MannyAI



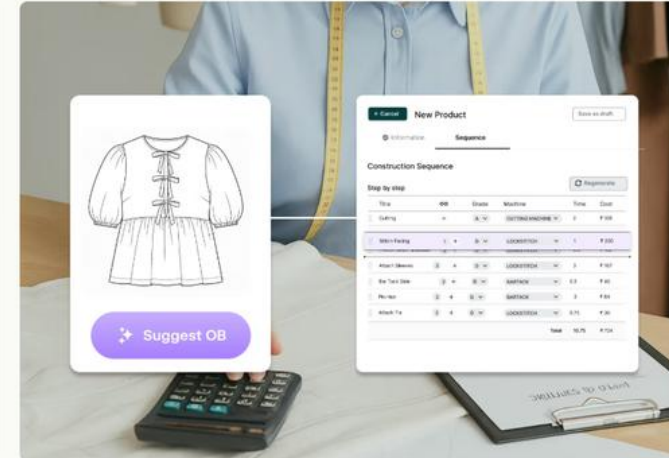
The AI Stack for Agile Fashion Supply Chains.

Role-specific tools to accelerate sourcing, costing, and production planning — without adding complexity.



Auto-Generate BOMs

Product Development



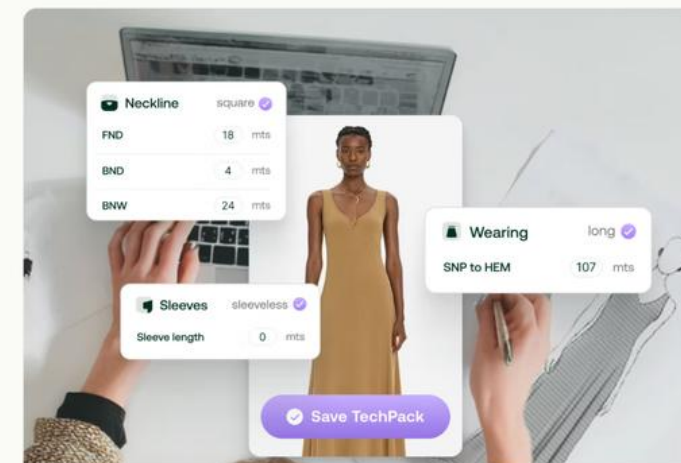
Seamstream

Industrial Engineers



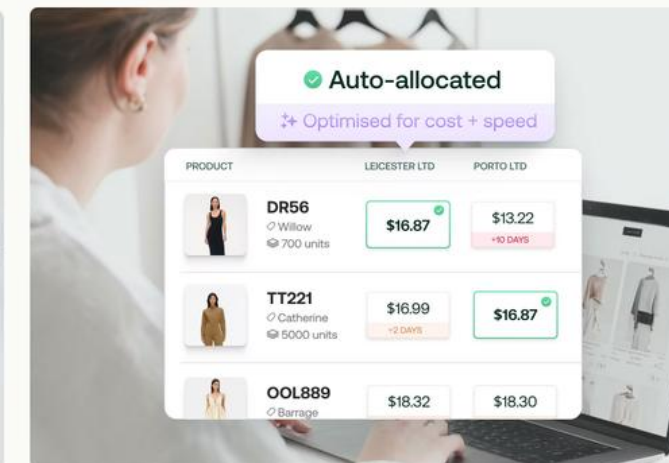
Capacity Planning

Factory Managers



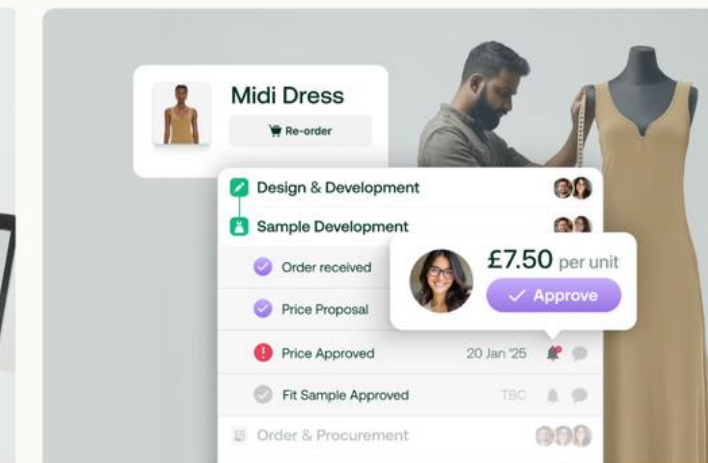
Tech Pack Enhancer

Product Development



AI Supplier Matching

Buyers



Real-Time Critical Path

All Teams

Innovation spotlight: Eslando

The Eslando logo is displayed in a stylized, lowercase font. The letters are black and set against a light purple rectangular background. The font is modern and slightly rounded.

Eslando is a marketplace platform for sourcing and selling recyclable waste textiles. Recyclers can find the type of feedstock they need for their process (chemical, mechanical or other recycling) while manufacturers can maximise their revenues whilst reducing their environmental impact.



A photograph of a group of people at a networking event. In the foreground, a man in a dark blue t-shirt and light-colored trousers is talking to a woman in a purple coat. They are both wearing lanyards. Other people are visible in the background, some looking at a display on the left. The setting is a modern interior with large windows and indoor plants.

Our role in innovation

A network built for a whole-sector transition

**INNOVATION
COMMUNITY**

INNOVATION EVENTS

**INNOVATION
PARTNERSHIPS**

ACADEMIC R&D

INDUSTRY R&D

UKFT connects the ecosystem - not just part of the value chain.

Key takeaways and conclusion



A background image of three scientists in a laboratory. A woman on the left is looking up. A man in the center, wearing safety glasses, is also looking up. A woman on the right is smiling and looking up at a petri dish being held up by a gloved hand. The scene is dimly lit with a blue tint.

The challenge isn't a shortage of ideas. It's the journey from invention to innovation, from innovation to adoption, and **from adoption to system change.**

System conditions for innovation to scale

TECHNOLOGY

ECONOMICS

INFRASTRUCTURE

BEHAVIOUR

POLICY



**Innovation is the catalyst.
Systems are the change
mechanism.**

End

Lauren Junestrand

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