POSITIVE FASHION
CIRCULAR FASHION INNOVATION NETWORK

Circular Fashion Innovation Network

CFIN MAY 2025 REPORT

ACCELERATING TOWARDS A CIRCULAR FASHION ECOSYSTEM IN THE UK

BRITISH FASHION COUNCIL

ukft

UKRI Innovate UK

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Executive Summary

KEY HEADLINES AND ACHIEVEMENTS

The Circular Fashion Innovation Network (CFIN) has successfully mobilised the UK fashion and textile industry toward a circular future. By convening more than 250 organisations spanning the entire value chain – from raw material suppliers to end-of-life processors – CFIN has created unprecedented alignment around practical pathways to circularity. This industry-led approach has brought together businesses representing 42% of UK clothing sales by volume, creating sufficient market influence to drive meaningful change.

Our collaborative work has delivered key transformative outputs with significant industry support:

A comprehensive National Textile Recycling Infrastructure Plan which provides a strategic roadmap for developing domestic recycling capabilities to process the 1.3 million tonnes of post-consumer textiles generated annually in the UK. This plan addresses four key areas:

1. Building advanced infrastructure to enable automated textile sorting, pre-processing, and fibre-to-fibre recycling.
2. Investing in technology to drive automation and innovation.
3. Developing workforce skills to support job growth across emerging textile recycling supply chains.
4. Expanding market capacity to establish a strong, economically viable market for recycled textile products.

A practical, industry-supported Extended Producer Responsibility (EPR) framework for textiles built on three core principles:

1. Mandatory participation across all fashion and textile manufacturers and retailers to create a level playing field.
2. Variable eco-modulated fees that reward sustainable practices and penalise environmentally harmful ones.
3. Hypothecated tax revenue dedicated to investing in circular fashion and textiles innovation, and infrastructure.

Through our work across six thematic areas, CFIN has also provided critical insights into industry challenges and opportunities.

Our analysis of circular business models (CBM) has revealed a significant intention-action gap: while 81% of fashion organisations include circularity in their five-year strategies, 63% of customer-facing initiatives remain in pilot phases. Through industry engagement, we've identified specific growth potential across different models:

- Resale shows particular promise for mass market and premium retailers, with 78% of initiatives currently in pilot phases.
- Repair demonstrates strong adoption in premium sectors (57% were premium player led) with the highest customer participation rate (25%).
- Takeback presents significant potential for mid-market retailers (38% of Takeback CBMs from our survey were from this group) due to higher production volumes.

By facilitating work on sustainable manufacturing, CFIN has demonstrated concrete evidence for reshoring opportunities through:

- Reshoring feasibility study with eight market-leading retailers (combined turnover of £26.1 billion) identifying opportunities in knitwear, jersey, printing and Cut-Make-Trim operations.
- Automation and robotics research demonstrating ways to increase efficiency while upskilling the workforce.
- Successful pilot projects showing faster turnaround times, reduced delays, and minimised fabric waste through technologies like AI and onshore finishing.

"CFIN has redefined how our industry approaches sustainability by creating practical pathways rather than theoretical ideals. What makes this network extraordinary is its ability to unite stakeholders from across the entire value chain, breaking down traditional silos and fostering genuine collaboration. As I reflect on my 15 years at the BFC, this industry-wide circular transition stands as a defining achievement—proving that environmental responsibility and commercial success can go hand-in-hand."

Caroline Rush CBE, Former CEO, British Fashion Council

Executive Summary

THE FIRST INDUSTRY-LED NETWORK OF ITS KIND

CFIN represents a fundamentally different approach to driving industry change. Unlike previous initiatives that have approached sustainability leading with social or environmental goals, CFIN brings industry together to develop market-driven solutions.

This distinctive convening structure enables CFIN to:

- Facilitate practical solutions based on commercial realities rather than theoretical ideals.
- Support testing and validation of circular approaches in real commercial settings to measure actual business impacts.
- Bridge traditional industry divides by bringing together stakeholders across the entire value chain.
- Enable the development of tools based on market experience rather than hypothetical scenarios.

THE NEED FOR CONTINUITY

The foundations established over the past two years provide an essential platform for future progress, but implementing systemic change requires sustained effort and resources. Continued funding for CFIN as a convener and facilitator is critical to transform the insights and roadmaps developed into industry-wide action.

Without continued funding and support, the UK risks:

- Fragmentation of efforts across disconnected initiatives.
- Loss of momentum as industry participants revert to siloed approaches.
- Competitive disadvantage versus regions with coordinated circular programmes.
- Missed economic opportunities in manufacturing and technology innovation.
- Insufficient preparation for upcoming regulatory requirements.

It is essential that the government continues to fund this work alongside complementary initiatives to achieve the transition to a circular fashion ecosystem. CFIN has successfully created industry alignment and momentum that must be sustained to deliver on the opportunities identified.

"The transformative power of CFIN lies in its ability to unite the entire fashion ecosystem around practical solutions for circularity. Our work has revealed significant opportunities for reshoring manufacturing and developing domestic recycling infrastructure—turning environmental imperatives into economic advantages for the UK. By addressing everything from advanced sorting technologies to workforce development, we're creating a comprehensive roadmap that benefits the entire value chain. This collaborative approach has transformed how we think about circularity—not just as an environmental necessity, but as a catalyst for innovation, resilience and growth across our industry."

Adam Mansell, CEO, UK Fashion and Textile Association

Executive Summary

OUR AMBITION AND THE CALL FOR ACTION

By continuing to convene key stakeholders and facilitate collaboration, CFIN can help position the UK as a leader in circular fashion. We call on all stakeholders to work together toward this shared vision.

For government and policymakers: Provide continued funding for CFIN's critical convening role and implement the EPR framework developed with industry to create the necessary market incentives and funding for infrastructure investment for circular transition.

For brands and retailers: Build on the collaborative foundations established to scale circular business models from pilots to mainstream operations and integrate circular design principles across product ranges.

For manufacturers and recyclers: Engage in the implementation of the National Textile Recycling Infrastructure Plan to build domestic capabilities for sustainable production and material recovery.

For investors and financial institutions: Utilise the insights developed to inform investment decisions and develop tailored financial instruments that support circular innovation.

With continued support for CFIN's convening role, the industry can work together toward:

- New skilled jobs in textile recycling, remanufacturing and circular services.
- UK-based manufacturing using advanced technologies and circular principles.
- A thriving ecosystem of circular startups and innovations.
- Domestic infrastructure for textile collection, sorting and recycling.
- Competitive advantage for UK brands and retailers through circular business models.

The change that industry can achieve through CFIN's facilitation extends beyond environmental improvements to include business growth, job creation, manufacturing renewal and technology leadership – helping to position the UK as a centre of excellence for circular fashion.

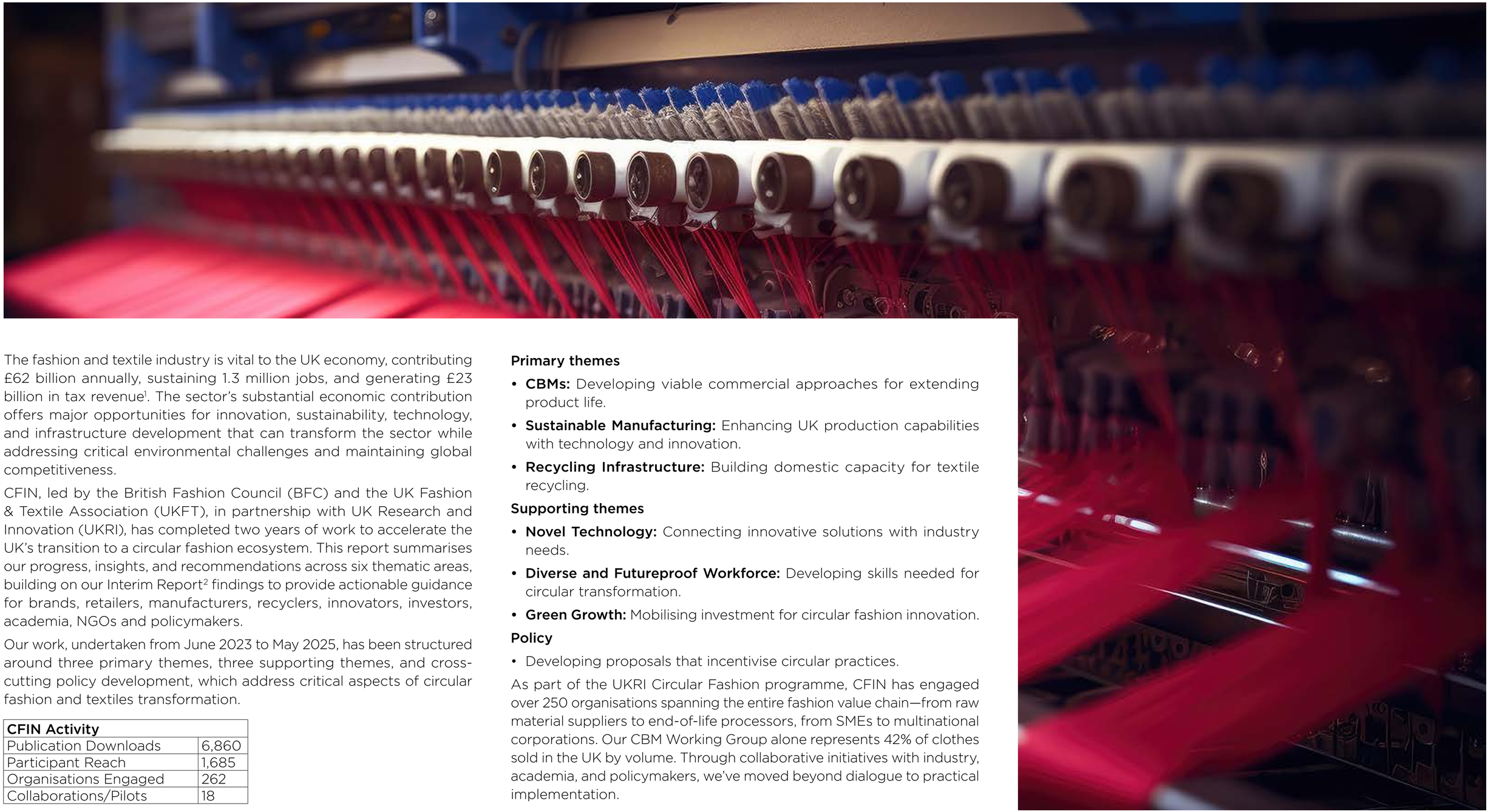
"CFIN exemplifies the power of industry-led innovation to drive meaningful change. By bringing together expertise from across the fashion ecosystem, we've developed practical solutions that address commercial realities while advancing sustainability goals. This work aligns with the UK's Invest 2035 strategy by spanning advanced manufacturing, clean energy, and creative industries. The frameworks and collaborative networks established through CFIN provide an essential foundation for continued progress—helping to position the UK as a leader in circular innovation, while creating new opportunities for growth and economic resilience."

Tom Fiddian, Head of AI & Data Economy Programmes at Innovate UK

Image credit: Siyun Huang

Chapter 1

Introduction



The fashion and textile industry is vital to the UK economy, contributing £62 billion annually, sustaining 1.3 million jobs, and generating £23 billion in tax revenue[1]. The sector's substantial economic contribution offers major opportunities for innovation, sustainability, technology, and infrastructure development that can transform the sector while addressing critical environmental challenges and maintaining global competitiveness.

CFIN, led by the British Fashion Council (BFC) and the UK Fashion & Textile Association (UKFT), in partnership with UK Research and Innovation (UKRI), has completed two years of work to accelerate the UK's transition to a circular fashion ecosystem. This report summarises our progress, insights, and recommendations across six thematic areas, building on our Interim Report[2] findings to provide actionable guidance for brands, retailers, manufacturers, recyclers, innovators, investors, academia, NGOs and policymakers.

Our work, undertaken from June 2023 to May 2025, has been structured around three primary themes, three supporting themes, and cross-cutting policy development, which address critical aspects of circular fashion and textiles transformation.

CFIN Activity	
Publication Downloads	6,860
Participant Reach	1,685
Organisations Engaged	262
Collaborations/Pilots	18

Primary themes

- **CBMs:** Developing viable commercial approaches for extending product life.
- **Sustainable Manufacturing:** Enhancing UK production capabilities with technology and innovation.
- **Recycling Infrastructure:** Building domestic capacity for textile recycling.

Supporting themes

- **Novel Technology:** Connecting innovative solutions with industry needs.
- **Diverse and Futureproof Workforce:** Developing skills needed for circular transformation.
- **Green Growth:** Mobilising investment for circular fashion innovation.

Policy

- Developing proposals that incentivise circular practices.

As part of the UKRI Circular Fashion programme, CFIN has engaged over 250 organisations spanning the entire fashion value chain—from raw material suppliers to end-of-life processors, from SMEs to multinational corporations. Our CBM Working Group alone represents 42% of clothes sold in the UK by volume. Through collaborative initiatives with industry, academia, and policymakers, we've moved beyond dialogue to practical implementation.

Key findings and opportunities

CBMs: While 81% of fashion organisations surveyed include circularity in their five-year strategies, 63% of customer-facing initiatives remain in pilot phases. Our research reveals significant growth opportunities across:

- **Resale:** Attracting mass market and premium retailers with 78% of initiatives in pilot phases.
- **Repair:** Showing strong adoption in premium sectors (57%) with the highest customer participation rate (25%).
- **Takeback:** Presenting potential for mid-market retailers (38% adoption) due to higher production and consumption volumes.
- **Rental and Remake:** Emerging models with growth potential in specific product categories.

Our workshops and guides have delivered practical guidance to help businesses overcome barriers, prepare for upcoming legislation, and plan for circular transition.

Sustainable Manufacturing: The UK's textile and apparel manufacturing sector offers substantial opportunities for economic growth and competitive advantage. Our comprehensive work in this area has delivered:

- Research on automation and robotics demonstrating opportunities to increase efficiency, reduce production costs, and improve quality while upskilling the workforce.
- Reshoring feasibility study with seven market-leading retailers (combined turnover of £26.11 billion) identifying opportunities across knitwear, jersey, printing and Cut-Make-Trim operations.
- Pilot projects with clear commercial benefits:
  - AI pilot showing faster turnaround times, reduced delays, minimised fabric waste, and improved supplier relations.
  - Onshore finishing pilot demonstrating that domestic denim finishing can transform unwashed jeans into trend-responsive products within the UK.
- Sustainability 101 Series delivering practical guides and educational webinars reaching over 1,500 industry professionals.

Our findings demonstrate that UK manufacturing offers enhanced supply chain resilience, faster response times, greater production agility, reduced carbon footprints, and creation of high-value, technology-enhanced manufacturing jobs.

Recycling Infrastructure: With 1.45 million[3] tonnes of post-consumer textiles generated annually in the UK, CFIN's National Textile Recycling Infrastructure Plan outlines a strategic approach to developing domestic textile recycling capabilities across four key areas:

- Building advanced infrastructure to enable automated textile sorting, pre-processing, and fibre-to-fibre recycling.
- Investing in technology to drive automation and innovation, paving the way for the creation of new business sectors.
- Developing workforce skills to support job growth across emerging textile recycling supply chains.
- Expanding market capacity to establish a strong, economically viable market for recycled textile products.

We have conducted a socio-economic impact analysis which demonstrates the significant potential benefits of developing this infrastructure.

Novel Technology: Our Novel Technology theme has connected innovative startups with brands, retailers, and investors to scale commercially viable circular solutions. The work has identified key technology opportunities, implementation barriers, and strategic recommendations to accelerate adoption.

Green Growth: Our commissioned expert research has examined how circular fashion businesses can access funding needed to scale. Analysis has challenged persistent investment myths while providing practical recommendations for mobilising capital across different stakeholder groups.

Diverse and Futureproof Workforce: Our skills research has identified critical capability gaps and tracked progress in education and training. Recommendations provide targeted guidance for industry, education providers, government, and employers to build the workforce needed for circular transformation.

Policy: Through our policy working group and collaboration with experts, we have developed a detailed proposition for implementing EPR legislation for textiles that balances environmental goals with business practicality. Our research and stakeholder engagement demonstrates the need for a mandatory, eco-modulated EPR system with fees ringfenced for reinvestment in circular infrastructure and innovation.

Collaborative next steps

We invite all stakeholders across the fashion and textiles value chain to build on the foundation established by CFIN through the following actions.

- **Brands and retailers:** Implement the circular business models identified in this report, setting ambitious targets for resale, repair, and takeback services while integrating sustainability metrics into core business strategies.
- **Manufacturers:** Explore automation, reshoring, and sustainable production opportunities highlighted in our research, partnering with technology providers to build more resilient and responsive supply chains.
- **Investors and financial institutions:** Address funding gaps for circular innovations by developing specialist knowledge of textile value chains and creating investment vehicles tailored to circular business models.
- **Policymakers:** Advance the detailed EPR framework proposed in this report while creating consistent regulatory incentives that drive circular practices across the industry.
- **Education providers:** Integrate circular economy principles into curricula and develop targeted training to address the skills gaps identified in our research.

For these collaborative actions to succeed, continued and enhanced support for CFIN is essential. The systemic changes required for a circular fashion ecosystem demand long-term, coordinated industry engagement that only an industry-led network like CFIN can facilitate. Longer-term funding mechanisms for CFIN would ensure the continuity of this critical work, enabling the industry to move beyond short-term pilots to sustained implementation at scale.

Together, we can position the UK as a pioneering force in fashion circularity, creating a more resilient, innovative, and sustainable industry that delivers economic growth, environmental benefits, and social value.

Image credit: Regina Pyo

Chapter 2

Circular Business Models

Circular Business Models

INTRODUCTION

This report defines CBMs as business models, such as clothing rental or subscription schemes, that minimise the material used and waste produced while maximising the value of materials and products by keeping them in use for as long as possible, if not permanently. These models promote a focus on the triple bottom line – people, planet and profit. CBMs represent a potential $700 billion (£522.2 billion) global opportunity by 2030, capturing almost a quarter of the fashion market[4].

CFIN research has revealed significant UK industry appetite for CBMs, while consumers express willingness to engage with circular offerings[5]. This chapter delves into critical insights, focusing on five key CBMs shaping the UK fashion landscape - Resale, Repair, Rental, Remake, and Takebacks - as well as Circular Design.

Our industry survey, conducted in partnership with Newton, provides a snapshot of CBM adoption across the UK fashion sector. While we observe promising trends in implementation, significant challenges remain, including the lack of standardised definitions for 'circular products' and the critical gap between intention and scalable implementation. Circular design principles are integral to ensuring the success of CBMs, laying the foundation for product longevity, recyclability, and reduced environmental footprint.

Our work has highlighted the economic and environmental imperatives driving the adoption of CBMs. Extending product lifecycles, addressing the financial challenges of implementing new circular systems, and preparing for evolving regulatory landscapes are essential for long-term sustainability and competitiveness.

SUMMARY OF KEY ACTIVITIES

CFIN has worked with brands, retailers and stakeholders across the fashion supply chain to understand the commercial opportunities and implementation challenges of circular business models. CFIN's CBM Working Group represents stakeholders from organisations that account for 42% of clothes sold in the UK by volume. Through industry surveys, workshops and partnerships, we have examined the intention-action gap, CBM maturity across market segments, and the role of customer communication in driving circular engagement. This section analyses each CBM, highlighting successes and challenges, and provides actionable recommendations for scaling circular operations across the UK fashion industry.

The state of circularity in UK fashion industry survey

CFIN partnered with Newton to conduct a comprehensive industry-wide survey[6] aimed at understanding the adoption, scaling, and implementation of circular business models in the UK fashion retail sector. The survey captured a cross-section of the sector, with 49 responses from brands, retailers, and SMEs. The group represent one-third of the UK fashion market based on annual revenue. Of our group, we received responses from 10 retailers each generating more than £1 billion in annual revenue.

The research provided crucial insights into the current landscape of circular initiatives, capturing data on repair, rental, resale, remake, and takeback schemes, as well as circular design practices. Our research uncovered a persistent challenge in the industry's circular transformation: despite widespread adoption of initial circular initiatives, brands struggle significantly with scaling these models beyond pilot phases. This implementation gap points to a need for developing both technical expertise and strategic capabilities across organisations.

Shaping the future of circular fashion communication workshop and report

Recognising that customer communication represents a major obstacle to scaling circular initiatives, CFIN collaborated with Clarasys and APE Studios to develop guidance on effective circular fashion communication. The workshop and subsequent report[7] identified three key barriers to scaling CBMs: regulatory pressures, customer scepticism, and internal operational challenges.

The research revealed that 40% of UK brands and retailers struggle with communicating circularity effectively, making it a critical obstacle to scaling sustainable business models. The report explored solutions for navigating regulatory uncertainty, building customer trust, aligning internal brand functions, and developing effective storytelling approaches.

This work culminated in a practical roadmap to help brands enhance customer engagement, ensure compliance with regulations such as the EU Green Claims Directive (GCD)[8], and integrate circularity effectively into their brand narratives.

Eco-design workshop

Recognising the need to implement circular design principles as foundational to reach circularity, CFIN conducted a targeted eco-design workshop[9] with 27 guests from 12 brands to explore how brands can integrate circularity at the design stage. The workshop identified eco-design as a business imperative that moves beyond mere compliance to drive long-term resilience.

The session explored implementation challenges including material innovation gaps, supply chain complexities, and consumer engagement barriers. It emphasised strategies for embedding circularity at the design stage, collaborating across the value chain, and developing effective impact measurements to track and improve product circularity performance.

The findings underscored the importance of aligning eco-design strategies with upcoming regulations to Futureproof business models and the potential of innovative approaches such as resale, rental, and product-as-a-service to extend product lifecycles.

CBM playbook

CFIN developed a comprehensive playbook to guide the mid-level market to luxury fashion businesses through adopting and scaling circular business models. The playbook emphasises a shift from siloed operations to interconnected ecosystems across product design, business models, customer engagement, physical systems, and legislative preparedness.

The playbook introduces a dynamic framework through a 'Now-Next-Future' lens, guiding businesses from foundational actions to forward-thinking innovations, with key insights including:

- **Systems Thinking:** Breaking down internal barriers and engaging with cross-industry ecosystems.
- **Financial Viability:** Exploring new value through inventory regeneration, brand value, and integrated circular services.
- **New Business Models:** Introducing untapped revenue streams such as digital fashion, subscriptions, and experiential offerings.
- **Physical Circularity:** Designing for modularity, repair, and transparency through Digital Product Passports.
- **Operational Systems:** Evolving internal integration across departments, KPIs, and data systems.
- **Customer Engagement:** Positioning customers as co-creators through education and emotional engagement.
- **Legislative Preparedness:** Addressing upcoming EU regulations through data readiness and cross-border compliance strategies.

CBM analysis

THE INTENTION-ACTION GAP IN CIRCULAR IMPLEMENTATION

There is a significant disconnect between the fashion industry's circular ambitions and its ability to translate these intentions into scalable business models. While 81% of organisations have integrated circularity into their five-year strategies and 82% have already implemented at least one circular initiative, none of these businesses reported confidence in their ability to scale these models.

This intention-action gap stems from several interconnected factors.

Financial and operational constraints

Approximately 50% of UK brands and retailers identified limited financial margin as a primary barrier to circular initiative success. The current economic climate has intensified pressure on both top and bottom lines, making brands hesitant to allocate resources to models that carry additional costs or perceived risks. Many circular initiatives remain in pilot phases, unable to benefit from economies of scale that would enhance their financial viability.

The operational complexity of managing circular flows - particularly for takeback schemes, repair services, and resale operations - creates significant logistical challenges. These require substantial investment in infrastructure, systems, and expertise that many brands lack. The high dependency on third-party partnerships (with 88% of resale and takeback initiatives accessing third-party support) further complicates integration with core business operations.

Market segment variations

There are clear patterns in circular model adoption across different market segments. Premium and luxury brands show stronger implementation of repair services (57% compared to 15% in mid-market and value segments) and remake initiatives (36% versus 23%). These models align naturally with their brand proposition of quality, craftsmanship, and longevity.

Conversely, mid-market and value retailers demonstrate greater adoption of takeback schemes (38% compared to 21% in premium/luxury) and show comparable engagement with resale and rental models (31% each). This reflects higher product volumes and customer frequency, creating opportunities and challenges for circular transformation.

One size does not fit all when it comes to circular business models. Effective strategies must be tailored to each brand's market position, customer expectations, and operational capabilities, rather than applying universal approaches that may not align with business realities.

Communication and customer engagement challenges

40% of UK brands and retailers identified customer communication as a major barrier to circular initiative success. Consumer scepticism, confusion around sustainability terminology, and perceived inconvenience of circular options all contribute to lower-than-expected participation rates.

Our research found that 47% of customers cite limited availability or lack of awareness as factors preventing their engagement with circular business models. This suggests a significant opportunity for brands to strengthen their marketing and education efforts around circular offerings.

Many brands are caught in a "greenhushing" trap—hesitant to communicate their sustainability efforts due to fears of greenwashing accusations, particularly in light of evolving regulations like the GCD. This creates a cycle where limited communication leads to limited customer awareness, which in turn constrains demand for circular options.

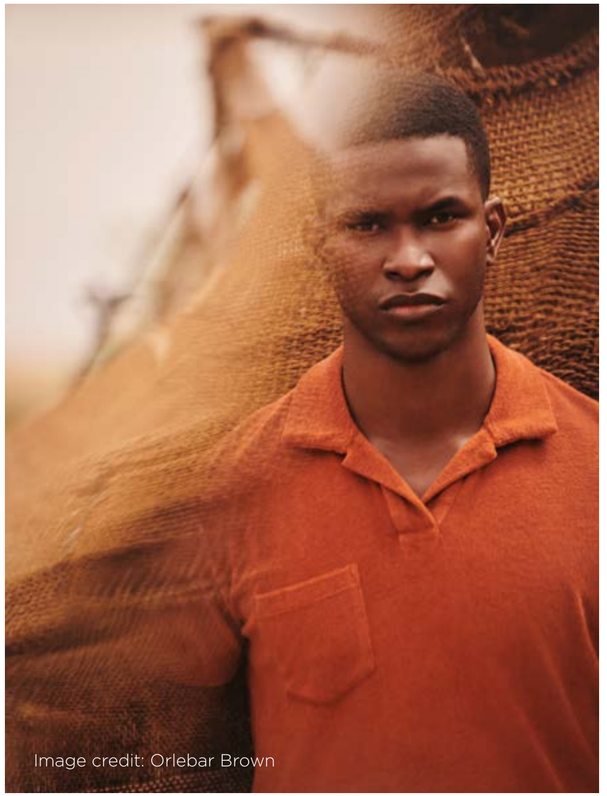


Image credit: Orlebar Brown

ACROSS CBMS, CLEAR PATTERNS OF IMPLEMENTATION EMERGE:

Circular Design

Foundation with room for growth

Circular design represents the most prevalent circular initiative, with 51% of brands embedding circular design principles in their product ranges. However, definitions and approaches vary significantly, creating market fragmentation and customer confusion. The lack of standardisation around circular design principles presents both a challenge for industry alignment and an opportunity for leadership.

Additionally, establishing the connection between emissions reduction through circular design strategies is increasingly part of the industry discourse to reduce overall environmental impacts. Specifically, the role of circular design principles as part of a wider net zero business strategy.

Repair

Strong in premium, struggling in mass market

While repair services align naturally with the premium sector's value proposition, they face significant challenges in mid-market and value segments where lower product price points make repair services less financially viable—with repair costs often approaching the item's value and customers less willing to pay for the service. Despite having the highest customer participation rate (25%) among circular initiatives, repair services remain constrained by skill shortages, operational complexity, and limited revenue potential. Bridging this gap may require innovative business models, scalable logistics solutions, and public-private investment in repair infrastructure to create economically sustainable repair ecosystems across all market segments.

Resale

Promising but complex

Resale attracts interest across premium and mass market but faces substantial implementation challenges. With 78% of resale initiatives still in pilot phases, brands are struggling to overcome operational hurdles including logistics, quality control, and platform development. The heavy reliance on third-party partnerships (88%) indicates that most brands struggle to scale due to operational hurdles such as logistics, quality assurance, and platform infrastructure.

Takeback

Volume opportunity, infrastructure challenge

Takeback schemes present significant potential for mid-market and value retailers due to their higher volumes but are hindered by reverse logistics challenges and limited infrastructure for processing collected items. The research reveals that many takeback initiatives are not revenue-generating, making them vulnerable to budget constraints without clear commercial models.

Rental and Remake

Emerging models with niche applications

Rental and remake represent less mature circular models, with rental initiatives hampered by operational complexity and limited profit margins. Remake initiatives face challenges around sourcing suitable materials and cultivating necessary craftsmanship skills. Both models currently occupy niche positions but show potential for growth through targeted application in specific product categories and market segments.

These variations in implementation underscore the need for differentiated approaches to CBM development, with strategies tailored to each brand's specific market context, operational capabilities, and customer relationships.

The CBM implementation landscape

Image credit: Qasimi

Communicating with the customer

Effective customer communication has emerged as a critical obstacle to scaling CBMs in the UK fashion industry. CFIN research reveals that 40% of UK brands and retailers identify customer communication as a major barrier to the success of circular initiatives, underscoring the need for more strategic, consistent, and compelling engagement with consumers.

This was echoed in the ‘Shaping the Future of Circular Fashion Communication’ Workshop. Marketing leaders from across the sector highlighted communication as a key pain point — citing challenges such as navigating sustainability terminology, overcoming consumer scepticism, and avoiding greenwashing pitfalls.

Regulatory pressures

The evolving regulatory landscape, particularly the EU GCD, is transforming how brands can communicate sustainability efforts. The GCD prohibits vague sustainability claims, requires third-party verification, and bans self-certified labels.

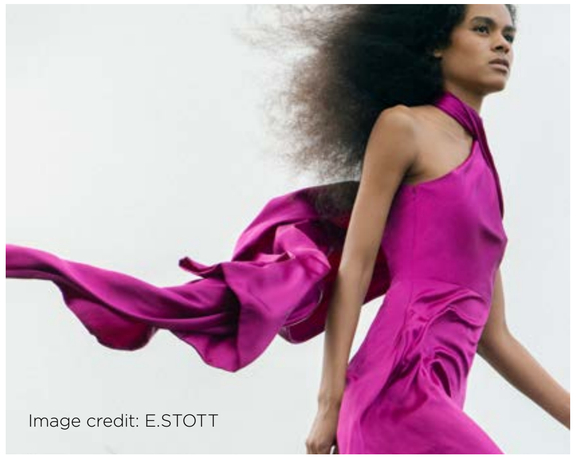


Image credit: E.STOTT

Internal operational challenges

Siloed teams, conflicting priorities, and technological limitations create disconnects between sustainability ambitions and customer-facing communications. Survey data indicates that 41% of fashion brands consider internal organisational barriers and technological challenges as their biggest hurdles to overcome. This highlights the need for more integrated structures, cross-functional collaboration, and investment in enabling systems to deliver on circular ambitions.

The customer engagement triangle

Through CFIN and Clarasys research, we identified three interconnected barriers that fashion brands must navigate when communicating circularity to customers.

Customer barriers

Consumer scepticism, confusion around sustainability terminology, and perceived inconvenience contribute to limited engagement with circular options. Our research found that 47% of customers cite limited availability or lack of awareness as factors preventing their engagement with circular business models. Key challenges include:

- **Trust deficit:** A history of greenwashing has created deep-seated consumer scepticism about brands' circular claims.
- **Complexity and confusion:** Technical sustainability terminology often fails to resonate with consumers.
- **Value perception gap:** Customers frequently perceive circular options as lacking financial appeal or convenience.
- **Limited awareness:** Many customers don't understand circular fashion or see it as aspirational.

Recommendations for effective circular communication

TO ADDRESS THESE CHALLENGES, WE RECOMMEND THE FOLLOWING ACTIONS FOR BRANDS IMPLEMENTING CBMS.

For customer-centric experiences:

- Focus on solving real customer problems rather than simply promoting circularity.
- Simplify complexity by translating technical sustainability efforts into relatable stories.
- Develop persona-specific engagement tactics that meet different customer segments' needs.
- Make measurable impact claims using quantifiable data rather than vague sustainability statements.
- Ensure third-party verification through recognised certifications to validate claims.
- Implement Digital Product Passports[10] to enhance transparency and provide detailed product information.

For implementation and scaling:

- Audit existing circular initiatives and compliance risks in light of GCD and other regulations.
- Design incentive models that resonate with customers and encourage participation.
- Leverage digital tools to enhance circular engagement and track impact.
- Strengthen data infrastructure to measure circularity adoption and customer participation.
- Redesign supply chains to enable seamless circular product flows.
- Adopt impact-driven metrics that measure both customer engagement and sustainability outcomes.

For internal alignment:

- Establish cross-functional taskforces that unite sustainability, marketing, and product teams.
- Embed circularity into business KPIs and leadership incentives.
- Prioritise staff training on circular business models and communication best practices.
- Implement data management systems that enable accurate sustainability messaging.

For policymakers:

- Provide clearer guidance and definitions around circular economy terms.
- Strengthen enforcement of misleading sustainability claims to ensure a level playing field.
- Fund public awareness campaigns to educate consumers on circular models.
- Support innovation through grants and incentives that help brands scale circular practices.

By addressing these interconnected areas, brands and stakeholders can create more effective circular communication strategies that drive customer participation, ensure compliance, and ultimately scale CBMs successfully.

Unlocking the potential of deadstock: The Materialist's showroom success to scale deadstock fabrics

INTRODUCTION

The fashion industry faces a significant challenge with textile waste, generating tens of millions tonnes annually. Deadstock fabrics, surplus materials from overproduction, offer an untapped resource that can reduce environmental impact and provide a cost-effective alternative to traditional fabrics. Deadstock materials are usually significantly cheaper than new fabrics, requiring fewer resources for production. With unsold textile inventory valued at $288 billion annually[11], repurposing deadstock presents a substantial opportunity.

The Materialist, in partnership with CFIN, facilitated the trade of high-quality deadstock fabrics through a showroom pilot in central London from April 2024 to April 2025, where over 5,000 varieties of deadstock fabrics were showcased.

Caroline Rush, Former CEO of the British Fashion Council, describes the showroom as a pioneering platform to educate the fashion industry on embedding deadstock textiles into circular business practices, broadening the CFIN network and contributing to the transition to net zero.

The showroom has demonstrated the business case and need for policy encouraging the increased use of deadstock fabrics. With £75K in sales, £27K in trades, and seven new suppliers (September 2024 - March 2025), the showroom's success is reflected in an 842% turnover increase, from £15,700 in 2023 to £147,920 in 2024. This underscores the growing demand for sustainable fabric solutions and confirms the scalability and economic viability of deadstock fabrics within circular fashion and textiles.

THE FINANCIAL CASE FOR DEADSTOCK

The Materialist offers deadstock fabrics at an average price of £9.78 per metre, which is 70% cheaper than new fabrics, priced at £16.63 per metre. These significant price advantages create a strong financial incentive for brands to adopt deadstock fabrics, reducing their sourcing costs while supporting sustainability.

For UK retailers, fabric procurement is a significant expense. A retailer purchasing 10,000 metres annually can save £68,500 by switching to deadstock fabrics as calculated from the average price per meter from deadstock suppliers like The Materialist, which would cost £97,800, compared to £166,300 for new fabrics. If 100 UK-based retailers adopt deadstock fabrics, the total savings could amount to £6.85 million annually, highlighting the substantial financial benefits of deadstock sourcing.

The Materialist's showroom and digital marketplace also demonstrate value, with an average order value of £1,250.52 for sales and £2,467.50 for trades (September 2024 - March 2025). These numbers, along with a 42% repeat purchase rate (January 2025 - April 2025), confirm the showroom pilot's success in growing traction across various customer segments, reinforcing the scalability and sustainability of the business model.

BUYER BEHAVIOUR

This pilot provided valuable insights into how brands are engaging with deadstock fabrics. Of the 118 total orders during this period, 92 (78%) were for production, while 26 (22%) were for sampling. This indicates that many brands are moving beyond the testing phase and incorporating deadstock fabrics into their production processes as part of their sustainability strategies.

Independent brands contribute to the majority of orders (89 orders from 49 brands) with a repeat purchase rate of 40.82%. Despite a lower repeat purchase rate compared to larger brands, independent brands drive order volume and show a strong commitment to sustainability through frequent, smaller orders.

Large brands, with a 66.67% repeat purchase rate, placed fewer orders (five orders from three brands), but their high repeat rate suggests that once they integrate deadstock fabrics into their sourcing, they are likely to continue using them. This demonstrates the scalability of The Materialist's model, which serves both emerging and established businesses.

Medium brands showed moderate engagement, with a repeat purchase rate of 42.86%. These brands place fewer orders than independent brands but are increasingly recognising the value of deadstock fabrics, signalling growth potential.

Overall, the showroom pilot showed a 42.37% repeat purchase rate across all segments, with 35.2% of showroom appointments converting into sales. Katie Imong from Sirplus highlights the unique advantage of accessing deadstock fabrics within a physical space noting that the Materialist's provision of traceability and care information sets it apart from other deadstock fabric suppliers.

IMPACT

Deadstock fabrics are increasingly seen as a sustainable, cost-effective alternative to traditional sourcing methods. The fashion industry generates approximately 92 million tonnes of textile waste annually[12], with around 15% of each textile production run wasted. This results in the loss of roughly $120 billion worth of unused textiles each year[13]. Much of this waste is sent to landfills or incinerators, even though it could be rescued, marketed, and repurposed into new collections. The potential to repurpose deadstock is substantial, with estimates suggesting that if even a portion of this waste were repurposed, the industry could experience significant environmental and economic benefits.

With the fashion industry consuming approximately 93 billion cubic metres of water annually and requiring 7,500 litres of water to produce just one pair of jeans[13], deadstock represents a critical solution to reduce this environmental burden. By purchasing deadstock, fashion brands can significantly decrease their water reliance. Buying just one yard of fabric from their marketplace saves 700 gallons of water[14].

The data gathered from both the showroom and digital marketplace highlights strong buyer engagement, with a notable repeat purchase rate of 42%, indicating that once brands engage with deadstock fabrics, they are likely to continue using them.

Having a physical showroom has proven crucial in converting appointments into actual sales, with a conversion rate of 35.2%, further validating the importance of tactile engagement in the buying decision process.

CONCLUSION

This pilot demonstrates how deadstock can play a central role in driving industry-wide change. It offers a financially viable and environmentally sustainable option for sourcing materials. With increased adoption, the industry could shift toward more sustainable and cost-efficient practices. The difference of a physical showroom highlights the scalability of deadstock fabrics, contributing to the transition to a more sustainable, circular fashion industry.

Recommendations

Based on CFIN's research and industry engagement, we recommend the following actions to implement and scale CBMs:

RECOMMENDATIONS FOR INDUSTRY

Adopt a tailored, context-specific approach

- Recognise that *"one size does not fit all"* — tailor CBMs to brand position, market segment, customer expectations, and operational capacity.
- Leverage strengths: premium brands for repair/remake (quality & longevity), mid/value segments for takeback/resale (high volume & frequency).

Close the intention-action gap

- Move beyond pilot initiatives through investment in infrastructure (repair networks, takeback logistics, resale platforms).
- Upskill teams and partner with third-party providers strategically.
- Embed circular design as a default, not a niche.
- Develop internal capabilities to scale effectively, not just experiment.

Embed circularity into design

- Prioritise eco-design as foundational — enabling durability, repairability, and recyclability.
- Align design choices with future regulatory requirements (e.g. Digital Product Passports, EU sustainability legislation).
- Innovate with modular, repairable designs, transparent material use, and end-of-life considerations.

Redesign internal operations

- Break silos — align sustainability, product, and marketing teams through cross-functional collaboration.
- Embed circularity into KPIs, data systems, and leadership incentives.
- Strengthen internal data management and impact tracking to support compliance, reporting, and decision-making.

Support infrastructure and ecosystems

- Collaborate across the value chain to create circular ecosystems (e.g., shared repair networks, resale platforms).
- Explore joint investment models and public-private partnerships to build national repair and takeback infrastructure.

Reframe circular models as business opportunities

- Use CBMs to unlock new revenue streams: resale platforms, rental services, subscription models, brand storytelling.
- Highlight financial viability via inventory regeneration, digital fashion, and customer loyalty.
- See circularity as a competitive differentiator and pathway to resilience, not just compliance.

Prepare for regulatory change

- Anticipate and align with upcoming regulations like the EU GCD and EPR[15].
- Build compliance into circular strategies early to Futureproof business models.

RECOMMENDATIONS FOR GOVERNMENT

Leverage policy and public support

- Work with policymakers to clarify definitions and enforcement around circular economy terms.
- Fund awareness campaigns to educate consumers on circular models.
- Offer grants and incentives for circular innovation.
- Support the development of blended finance mechanisms that de-risk private investment in circular business models.
- Review tax incentives to ensure they reward resource efficiency and circularity.
- Consider reforms to accounting standards to better reflect circular value creation.

CASE STUDY

Circular Threads - weaving a circular future for South Asian fashion

When Anoli Mehta attended two family weddings in 2017, she was struck by the volume of South Asian clothing worn just once. Determined to make a difference, she launched Circular Threads in 2021 - the UK's first resale platform dedicated to pre-loved South Asian clothing. Her market research confirmed the opportunity: *"We found 90% of respondents wanted to sell their outfits, but didn't have a platform to do so,"* she explains.

Circular Threads operates an online platform alongside a physical studio in North-West London, which follows an innovative eight-week rotational scheme to keep the shopping experience dynamic. The company has also partnered with boutiques to sell end-of-season sample pieces, ensuring these garments don't go to waste.

Despite having a lean team of four employees, Circular Threads has achieved notable organic growth through word-of-mouth within the tight-knit South Asian community. The company offers two service models: Standard (free listing with 25% commission) and VIP (£25 per item with 35% commission but enhanced visibility in the studio). Quality control is central to the experience, with thorough checks for each item and detailed measurements to ensure perfect fit.

For Anoli, Circular Threads is about more than building a successful business—it's about addressing a significant sustainability gap: *"The spotlight is completely on Western wear and UK high street retailers, but a whole industry is being ignored."*

Image credit: Circular Threads

The Low Carbon Transition Programme

The Low Carbon Transition Programme[16], led by the BFC's Institute of Positive Fashion and funded by the UK government through the UK's Shared Prosperity Fund, has supported 50 London-based fashion SMEs to measure their emissions and develop decarbonisation roadmaps to 2030. Findings from phase one of the IPF's Low Carbon Transition (LCT) programme, materials choice was established as a carbon hotspot and therefore a key decarbonisation lever.

Key circular economy elements included:

- Introduction to circularity: Presenting designers with opportunities that embedding circularity offers, potentially generating new income streams and strengthening customer relationships.
- Recycled materials: Tailored materials masterclasses to help businesses explore sustainable alternatives.
- CBMs: One-to-one workshops on implementing repair, rental and resale models.
- Circular propositions: Support to develop circularity propositions aligned with business objectives and customer needs.
- Customer insights: Tools to understand customer attitudes towards sustainable fashion and specific CBMs.

Participating businesses were taught about decarbonisation opportunities through circular economy principles including durability (making products last longer), utilisation (reusing items), and recycling (recovering materials). The programme highlighted the need to better connect circularity efforts with carbon reduction strategies.

A total of 31,057tCO_2e was measured across the 50 participating businesses, with companies committing to a total of 7,451tCO_2e of emissions reductions—averaging a 25% reduction by 2030. Following the programme's success, the BFC has secured additional funding to extend it until March 2026. Phase One of the LCT programme established materials choice as a carbon hotspot and key decarbonisation lever[17].

CASE STUDY

kitround - giving sports kit a second life

A conversation with her nephew about his unused football boots sparked the idea for Wendy Carter to create kitround, the UK's first dedicated pre-owned sports kit marketplace. *"Everyone has wardrobes full of kit that has nothing wrong with it at all - they just don't know what to do with it,"* says Carter, who launched the platform in June 2024, coinciding with Visa's search for sustainability solutions around sports kit.

What started as a modest goal to collect 1,000 pieces quickly exceeded expectations, collecting nearly 6,000 items through David Lloyd Clubs and Visa offices. kitround enables individuals to sell items while also providing sports clubs and charities with their own shops to raise funds for their causes. The London Irish Foundation has already raised over £6,000 through targeted campaigns.

The platform addresses both environmental challenges (with 711,000 tonnes of used textiles discarded in UK household waste annually) and accessibility issues (as 43% of UK community sports groups face rising participation costs). Strategic partnerships with sports bodies including Volleyball England, Birmingham County FA, and the Lawn Tennis Association have been crucial to kitround's growth.

With plans to expand across the UK and into Europe, kitround is developing new features including a loyalty programme and a donation programme to connect unused kit with those who need it most. By 2026, the company aims to establish itself as a pan-European platform with 150,000+ users and £5 million in revenue.

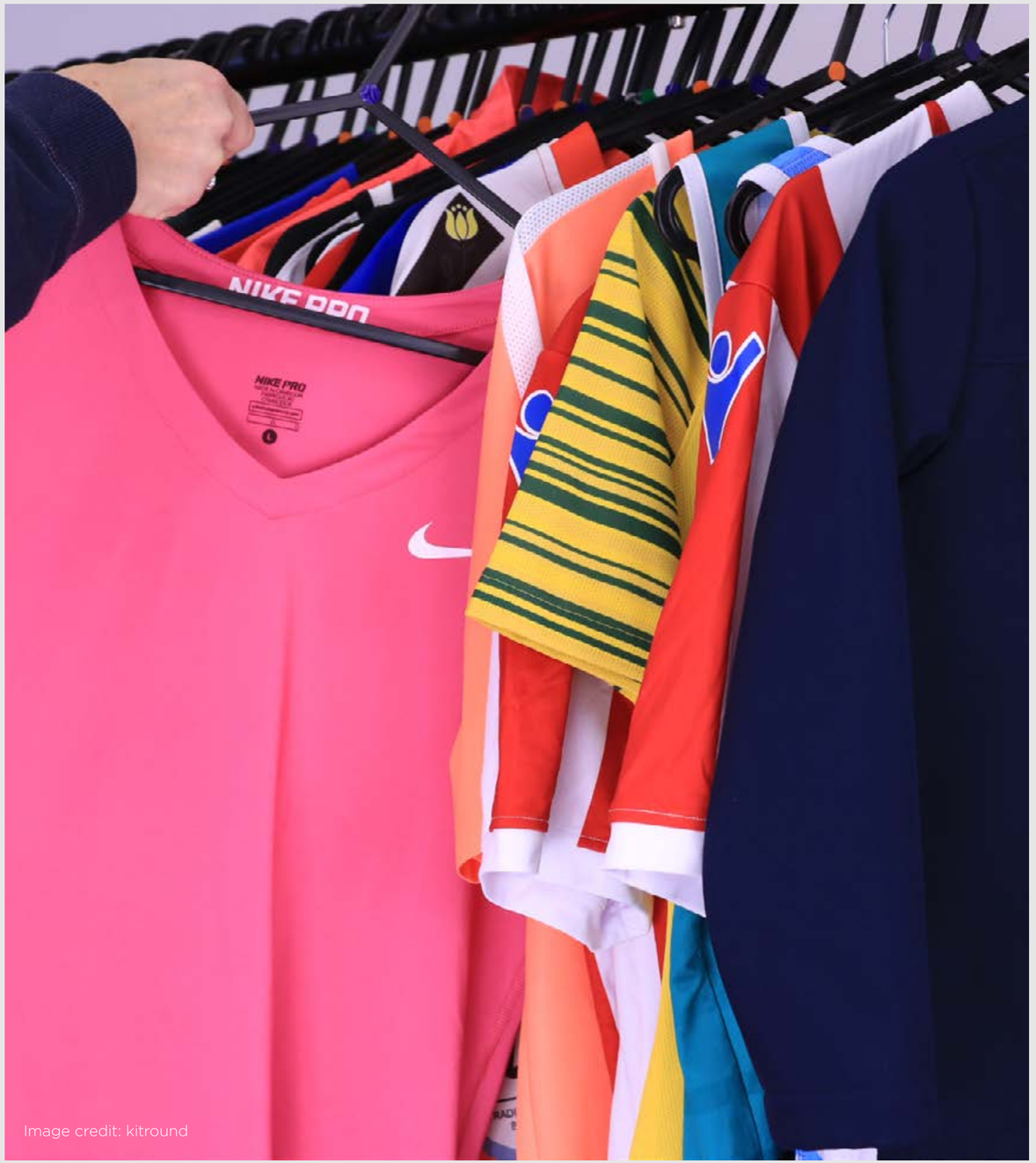


Image credit: kitround

Chapter 3

Sustainable Manufacturing

Sustainable Manufacturing

INTRODUCTION

The UK textile and apparel manufacturing sector, which has a strong socio-economic influence in the UK, has a valuable opportunity to unlock its full potential through sustainable transformation and technological innovation as part of a broader reshoring agenda.

The sector has demonstrated resilience, innovation and remarkable agility despite supply chain disruptions caused by Brexit and COVID-19, international competition and skills shortages in the sector. In fact, the opportunity for reshoring textile and apparel manufacturing to the UK has grown in significance as global supply chains face increasing scrutiny and disruption and demand for near shore manufacturing grows. Brands and retailers are seeking to move their production closer to home as part of a blended production strategy, enabling faster market response times, increased agility, reduced carbon footprints, transparency, greater control over manufacturing standards, and responsible supply-chain relationships.

AREAS FOR DEVELOPMENT

CFIN has identified seven key areas that must be addressed to unlock the potential for reshoring manufacturing to the UK.

Modernisation and digitalisation: The UK fashion and textile manufacturing sector must embrace modern manufacturing technologies including AI, automation and robotics, and digital supply-chains to improve competitiveness, efficiency and enable reshoring.

Innovation: The UK has an opportunity to develop and implement innovation as a key driver of growth and sustainable change, from advanced production methods to new manufacturing services.

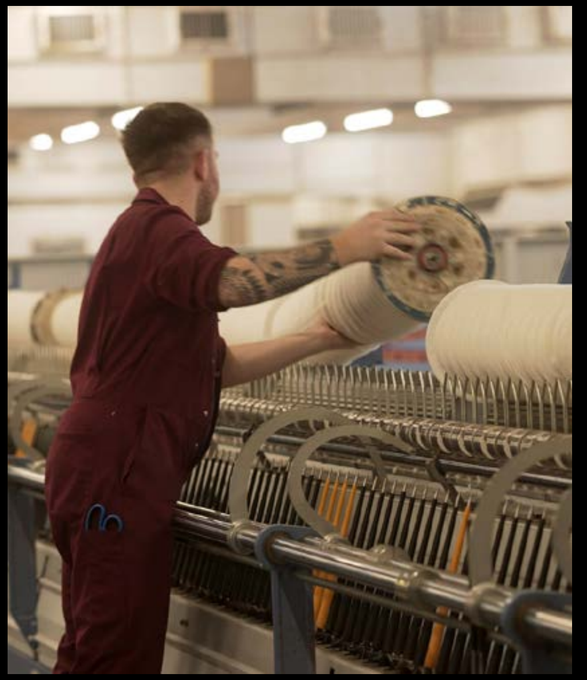
Responsible supply chains: UK manufacturers can differentiate themselves by fostering long-term collaborative relationships with brands, enabling coordinated approaches to sustainability challenges.

Compliance and standards: UK manufacturers must stay ahead of evolving sustainability regulations while implementing monitoring systems that position them as trusted partners for brands with stringent requirements.

Future proof skills and workforce: As research highlights significant skills gaps in the sector there is an opportunity to upskill the existing workforce and attract new talent under a narrative of modern, sustainable manufacturing.

Enabling infrastructure: Restoring UK manufacturing capacity depends on both technological advancement and strong supporting infrastructure, with regional manufacturing hubs playing a central role.

Sustainability education: With a high proportion (30%) of manufacturing businesses having nobody tasked with sustainability responsibilities, and manufacturers indicating as a priority challenge *"access to skilled workforce and specialist knowledge"* there is an opportunity to further develop sustainability education in the sector.



Reshoring for real: The future of UK domestic manufacturing

CFIN, in collaboration with SP & KO consultancy, conducted a survey study into current and future UK sourcing trends and explored the strategic case for developing an Apparel Manufacturing Park within the UK. The research engaged eight leading UK retailers with a combined turnover of £26.1 billion and operations in up to 180 countries. The findings published in 'The Future of UK Domestic Manufacturing' report offer valuable insights that demonstrate significant reshoring potential[18].

Current UK sourcing trends

The research found that although all retailers had previously sourced from the UK, only 75% continue to do so today—mainly to meet niche, agile, or test-and-react demands, and average order volumes remain low. This reinforces the UK's role as a flexible, agility driven sourcing option.

The most common UK-based manufacturing activity used among surveyed brands is garment printing, with 80% of those sourcing in the UK selecting this option. Many brands reported using UK printers primarily for printing and relabelling stock garments, or for applying prints to imported designs produced overseas. Knitwear production is the second most cited used activity, with 60% of retailers indicating they manufacture knitwear within the UK. In addition, several associated processes are currently carried out domestically, including dyeing (60%) and finishing (40%).

Type of buying: *"ad hoc", "test and react"* or *"volume"*

UK garment manufacturing is primarily used for quick turnaround and specialised production, not high-volume output. Key patterns include:

- Test and react: 50% of respondents use UK factories for *"test and react"* orders.
- Unique or personalised products: 38% use factories for one offs or personalisation such as printing.

All brands reported they do not place any volume orders in the UK.

Average order volumes

Both in the current supply status section and when asked about future aspirations, brands reiterate they use the UK for small orders. The average order volumes are generally between 500-1000 units (60%) with 20% being small (between 1-500 units). Agile, small-batch capability could be a major driver for UK sourcing.

Strategic partnerships - commitment planning vs ad-hoc buying

Most relationships with UK suppliers are on a short-term and flexible basis rather than deeply integrated partnerships. 63% described their UK sourcing as ad hoc or responsive ordering, while far fewer (25%) engage in long-term capacity planning with UK manufacturers. This indicates that UK factories are treated as a flexible overflow or quick response option rather than core long-term partners in the supply chain.

Key motivators for UK supplier selection

The top motivators according to surveyed retailers for UK sourcing are:

1. Quality: Consistently rated as the highest priority criterion.
2. Speed to market: Critical advantage of UK manufacturing.
3. Capacity availability: Access to production capacity when needed.
4. Design capabilities: Ability to interpret and execute design concepts.
5. Place small quantities: Flexibility to order in smaller batch sizes.
6. Test and repeat: Supporting iterative production processes.
7. Gain supply chain transparency: Better visibility into production processes.
8. Reduce carbon footprint: Lower emissions from reduced shipping distances.

Ethical concerns as a barrier

95% of brands (by turnover) acknowledged reports of unethical trade limited or eliminated their use of UK manufacturer. This underscores that ethical reputation is a major challenge for UK manufacturing. Brands demand robust, transparent, ethical practices as a precondition to gain trust for future UK engagement.

Domestic and global supply chain challenges

Domestic and global disruptions have placed significant strain on international supply chains, creating both challenges for traditional sourcing models and opportunities for UK manufacturing.

The research revealed several key factors affecting retailer sourcing decisions:

Brexit impacts:

- Two-thirds of respondents experienced Brexit-related challenges in their import supply chains, creating logistics friction and administrative burden.
- 75% reported higher administrative expenses (tariffs, customs paperwork) and delivery delays following Brexit implementation.
- Several companies noted particular complications serving European markets from UK bases post-Brexit.

Global geopolitical disruptions:

- All respondents have felt effects from recent geopolitical shifts and conflicts.
- Shipping delays emerged as the most significant impact, with two-thirds indicating *"high impact"* from global disruptions on transit times.
- Most experienced high impact from price inflation on imports.

These external pressures have increased interest in reshoring certain production.

However, it's notable that no respondent explicitly plans to shift volume production back to the UK yet.

Reshoring for real: The future of UK domestic manufacturing

Future plans and opportunities

When asked which categories they would ideally source from the UK:

- **Knitwear:** 100% of respondents selected knitwear.
- **Jersey:** 80% chose jersey (cut-and-sew knit garments).
- **CMT and Printing:** 60% expressed interest in more garment assembly and printing.
- **Denim and Woven Products:** 40% each showed interest in these categories.
- **Footwear:** 40% expressed interest in UK-made footwear.

These preferences suggest that if UK manufacturing capacity were improved, brands would first expand in categories where the UK already has strengths (knitwear, jersey, printing).

Key motivators for future UK sourcing

In a scenario where the UK supply chain becomes more robust and circular, the factors that would motivate brands to increase UK sourcing include:

- **Quality:** Remains the most important criterion.
- **Supply chain transparency:** Highly valued for risk management and compliance reporting.
- **Price:** Expected to become a more important factor in future UK factory selection. However, given that UK labour costs will remain relatively high, manufacturers and retailers must shift their focus from purely cost-cutting to maximising net margin — balancing competitive pricing with ethical standards, and value-added benefits.
- **Speed to market:** Continues to be a critical advantage of UK manufacturing.
- **Reduced carbon footprint:** Increasingly important for brands' environmental targets.

Strategic Recommendations

- **For brands:** Strengthen relationships with UK factories for agile supply needs, support compliance upgrades, and collaborate on sustainability initiatives to futureproof operations. Recognise the net cost of shipping and markdown both financially and in terms of carbon footprint accounting. Gain transparency and visibility of a level playing field by which to judge UK manufacturing.
- **For UK garment manufacturers:** Focus on strengths—speed, quality, transparency— and invest in cost-reducing technologies, ethical certification, and circular capabilities to win trust and business. High ethical standards and quality are the most important motivators to gain commitment.
- **For policymakers:** Facilitate textile recycling infrastructure at scale, leverage public procurement to help build and sustain UK manufacturing capacity, and support innovation in digital traceability to make the UK a global leader in sustainable fashion.
- **Inward investment opportunity:** Creating the right environment through aligned incentives, infrastructure, and skilled talent will help attract inward investment into UK apparel manufacturing to build regional capabilities, unlock new technologies and accelerate the transition to a circular economy. This includes both domestic and international investors seeking ethical, transparent, and technologically advanced production ecosystems.
- **Future viability:** With the right approach and engagement of all parties - brands, suppliers, government, policy makers and industry network support - alongside, investment and education, the UK can play a huge part in the future of a retailers blended sourcing strategy that will deliver a world leading on shore manufacturing capability. Creating green growth, jobs and investment while reducing carbon and environmental impacts.

In conclusion, the future of sourcing and circularity in the UK holds much promise. Companies are not looking to abandon global supply chains wholesale, but they clearly see the UK as a crucial part of a resilient, sustainable supply network – one that can quickly adapt to trends, reduce waste, and meet new ethical standards. The UK will play an important role in a matrix of Far, Near and Onshore sourcing strategy.

Advancing automation and robotics for sustainable manufacturing

In partnership with Manchester Metropolitan University's Robotics Living Lab (RoLL) and the Manufacturing Technology Centre (MTC), CFIN has conducted extensive research into the role of automation and robotics in the UK textile and apparel manufacturing sector.

From April to September 2024, a comprehensive research initiative employing workshops, follow-up surveys and in-depth interviews with industry stakeholders, explored practical applications of automation and robotics in manufacturing environments, examining both the capabilities of these emerging technologies and the implementation challenges faced by organisations adopting them. This work brought together over 30 representatives from leading textile and apparel manufacturing companies as well as brands and retailers, including Mulberry, John Smedley, Heathcoat Fabrics, Fashion Enter, Stella McCartney, and PANGAIA.

The findings provide strategic insights into how the UK can enhance its manufacturing capabilities through advanced technologies while supporting high quality manufacturing and the reshoring agenda. These insights have been summarised in our comprehensive report 'Advancing Automation and Robotics for Sustainable Manufacturing: Strategic Pathways for the UK Fashion and Textile Industry'[19].

Building on industry perspectives and collaborative discussions, a set of themes emerged, which are explored here.

Uses of automation and robotics within the fashion and textiles sector

Highly automated factories are used by the sector offshore; however, industry stakeholders had not seen this level of automation before in the UK.

- Robots can be used in monotonous and repetitive jobs so that human skills can be brought to the fore and celebrated.
- Collaborative robotics need to be easier to use and more intuitive.
- Firms suggested need for codesign of machine applications, working alongside designers and manufacturing facilities.

Likelihood of the uptake of robotic technologies

There is enthusiasm for the potential of innovative, low-carbon manufacturing techniques; however, many solutions are still emerging and under development before they can be widely implemented in the fashion and textile industry.

Robotics skills levels in manufacturing

Overall, in the UK, perceptions of factory work are still negative and there is a huge skills shortage across textile and apparel manufacturing. These beliefs were supported by the questionnaire results, confirming the idea that skilled worker recruitment was challenging. High level skills are required in many operations, and businesses *"would like to see if that is possible with robotics"*. There is an opportunity for robotics and automation to support skills shortages in the sector.

There are, however, several barriers to overcome, one of which is human perception. There are strong perceptions in environments where there is limited or no automation that the introduction of robotics means the human operator is replaced.

Businesses do not have sufficient knowledge about robotic capabilities to make informed decisions about implementation and would like further training to understand potentials.

Even so, robots can be utilised to enhance worker productivity and increase job security, shifting the narrative from employee replacements to automation and robotics as a tool for workforce enhancement and development.

"Robots and automation could have an immense impact on the textile industry, certainly to close a skills-based gap which a lot of companies are suffering from. The minute you introduce automation to a job; a lot of people seem to think that you are looking to remove them. What you're actually doing is making them more productive, more efficient. And you are also giving them a new skill by using and integrating with that technology." - Group Operations Director of UK manufacturer LLUK

Recommendations

As part of this research activity, CFIN recommendations include:

Unlocking growth through robotics and automation

UK Fashion and Textile companies could increase efficiency, reduce production costs, improve production quality and consistency using robotics with the right financial support (e.g. inward investment). There is an opportunity to recognise that the UK has emerging strengths in a combination of AI technologies, advanced manufacturing, and creative industries as a driver for fashion and textiles sector growth.

Upskilling and new narratives

Upskilling the workforce in the fashion and textiles sector requires developing a new narrative around modern industry and modern industrial practices with the support of UK universities and local, regional, and central government. With long term support from retailers UK fashion and textiles firms have the opportunity to move from prototype to scaled production with the efficient use of collaborative robotics, rather than completely replacing a human workforce, as a celebration of human skills. Upskilling a workforce becomes fundamental to this process.

Industry and academia collaboration

The research highlights the value of strengthening connections between industry and academia to address emerging skills needs. Initiatives such as the Network+ consortia[20], particularly the Leeds University-led Back to Baselines project[21], are creating frameworks to identify and address industry skills requirements across professional, educational and consumer categories. These collaborative approaches enable a more coordinated response to skills gaps by bringing together manufacturers, brands, educators and researchers. Through targeted industry-academic partnerships, the UK can develop more relevant curricula that integrate circularity principles and advanced manufacturing techniques, while breaking down traditional disciplinary silos that have limited innovation in the sector.

Circular manufacturing

In partnership with the Circular Concept Lab, CFIN hosted a workshop with more than 25 industry representatives to explore the role that textile and apparel manufacturers could play in the circular transition. This collaborative session brought together diverse perspectives from across the sector. The research focused particularly on identifying opportunities for manufacturers to support circularity across the supply chain as well as incorporating circularity initiatives in their own operations and business models to maintain competitiveness. The findings were synthesised into the Circular Manufacturing Report[22].

A successful circular textile and apparel system depends on commitment from many different stakeholders in the supply chain and along the product lifecycle, all working together to identify key challenges and to innovate, test and scale new ways of developing, producing, using and recycling textile-based products. UK textile and apparel manufacturers are in a unique position to support designers, brands and retailers to design and (re) manufacture circular products.

The three key circular manufacturing strategies that in collaboration with customers textile and apparel manufacturers can adopt are summarised in the following pillars:

Reduced Material Impact

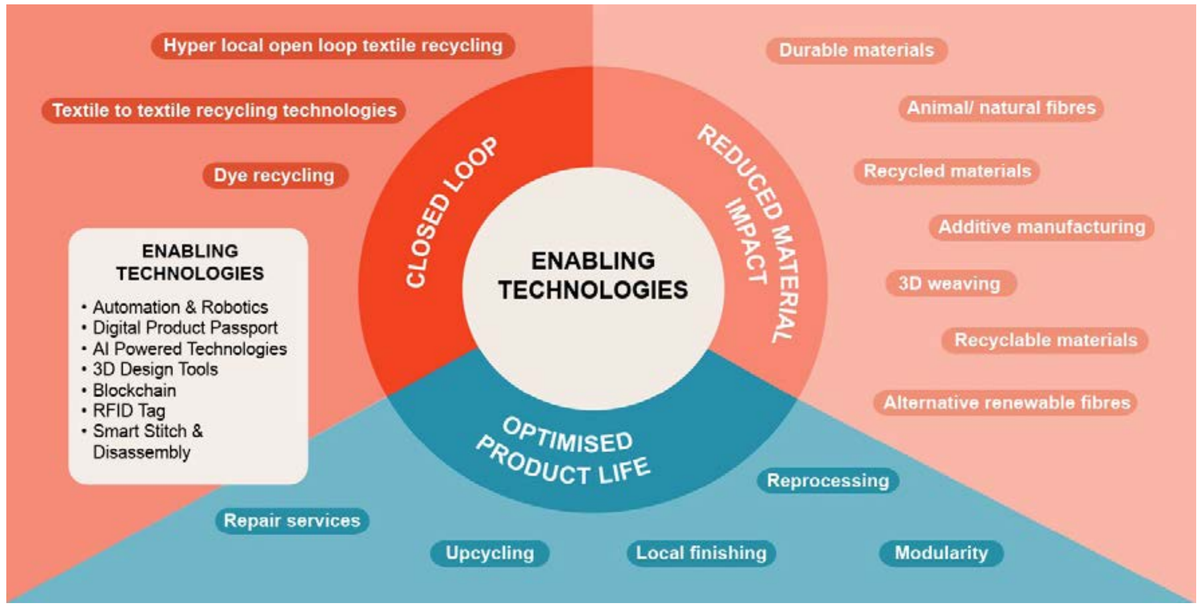
Textile and apparel manufacturers can reduce material impact by using durable, lower-impact materials like renewable, recycled, and recyclable options. They can also leverage 3D design software to minimise physical sampling and reduce waste by using minimal waste patterns, deadstock materials, and AI-driven technologies for material savings.

Optimised Product Life

Apparel manufacturers should focus on extending product lifespan by using durable materials, reinforcing stitching, and exploring repair and recycling options. Offering repair or upcycling services and innovating circular methods, like reprocessing unsold stock, can further support sustainability.

Closed Loop

Textile manufacturers can advance closed-loop products by integrating recycling technologies and partnering with recycling services to convert production waste into new raw materials. Collaboration with designers to create mono-material products or disassemble designs, along with recycling water, energy, and colour, can close the loop and boost circularity in production.



The following infographic provides a comprehensive view of where we are now and where we are heading in circular manufacturing. It highlights all the areas in which textile and apparel manufacturing can integrate strategies to advance circularity across the three key pillars – Reduced Material Impact, Optimised Product Life, Closed Loop – as well as technological innovations that can support the transition.

Circular manufacturing

Key priority areas for textile and apparel manufacturers

Through CFIN, five key actions have been identified for textile and apparel manufacturers to reach circular manufacturing.

Embrace and integrate new technologies and innovations

Manufacturers need to remain open to new circular technologies and innovations and be willing to experiment with them. This readiness will not only enhance their manufacturing capabilities but also drive the market towards sustainability.

Key actions

- Pilot programmes for technology and innovation: Encourage the adoption of new technologies and innovations by running small-scale experimental programmes and research & development (R&D) projects and supporting fit for purpose solutions.
- Investment in digital tools and technologies: Invest in tools and technologies and collaborate with supply chain stakeholders to digitalise supply-chains and improve data availability.
- Traditional skills: Utilise traditional skills (e.g. mechanical recycling of wool) to inform the development of innovative circular solutions for the industry.

Embed transparency for circularity

Transparency from the textile and apparel manufacturing stage is essential for circularity.

Key actions

- Transparency standards: Develop simple protocols for full disclosure of material origin, composition, and chemicals used, among others.
- Traceability solutions: Adopt traceability solutions like blockchain for product transparency, including tracking origin, composition, and chemical use. Alternatively, input data to traceability solutions embedded by clients when asked to do so, to facilitate decision-making in regard to sustainability.

Circular services as additional revenue streams

Textile and apparel manufacturers have the potential to add significant value to their business models by offering circular services that maximise resource efficiency, unlocking new business opportunities and revenue streams.

Key actions

Some examples of circular business models that can be incorporated in textile and apparel manufacturer business offer include:

- Repair and refurbish services: Offer in-house or partnered repair and refurbishment services.
- End-of-life solutions: Create solutions that support recycling operations, both for own and external waste.

However, realising this potential will require increased demand from brands and retailers, alongside workforce capacity and investment in the development and scaling of new solutions.

Upskilling

There is also an opportunity to upskill the current workforce in circularity and digitalisation. This applies to all skill levels, including C-suite.

Key actions

- Invest in internal workforce training.
- Work with academia to inform the development of future- proofing curriculum.
- Work with education and training providers to enhance students work experience in the manufacturing sector.

Proactive approach towards the evolving sustainability and circularity policy landscape

As sustainability regulations continue to evolve in the UK, EU and globally, manufacturers must stay ahead of upcoming policies and requirements.

Key actions

- Research the policy landscape: Stay updated on domestic and international sustainability laws and guidelines.
- **Standards and certifications:** Recognise that many sustainability legislations require third-party verification through credible standards and certifications.

Recommendations for policy makers and wider stakeholders

A successful transition to circularity in the UK textile and apparel sector requires coordinated action across several areas. All of the above initiatives will require targeted financial support. It is therefore essential that the government plays an active role by funding pilot programmes, investing in digitalisation efforts, and supporting the integration of traditional skills into innovative circular solutions. Targeted transition funding is essential to support R&D, technology adoption, and workforce development. Continued funding for industry-led initiatives like CFIN is critical to maintain momentum in workforce development and ensure that skills advancement keeps pace with technological and circularity transitions.

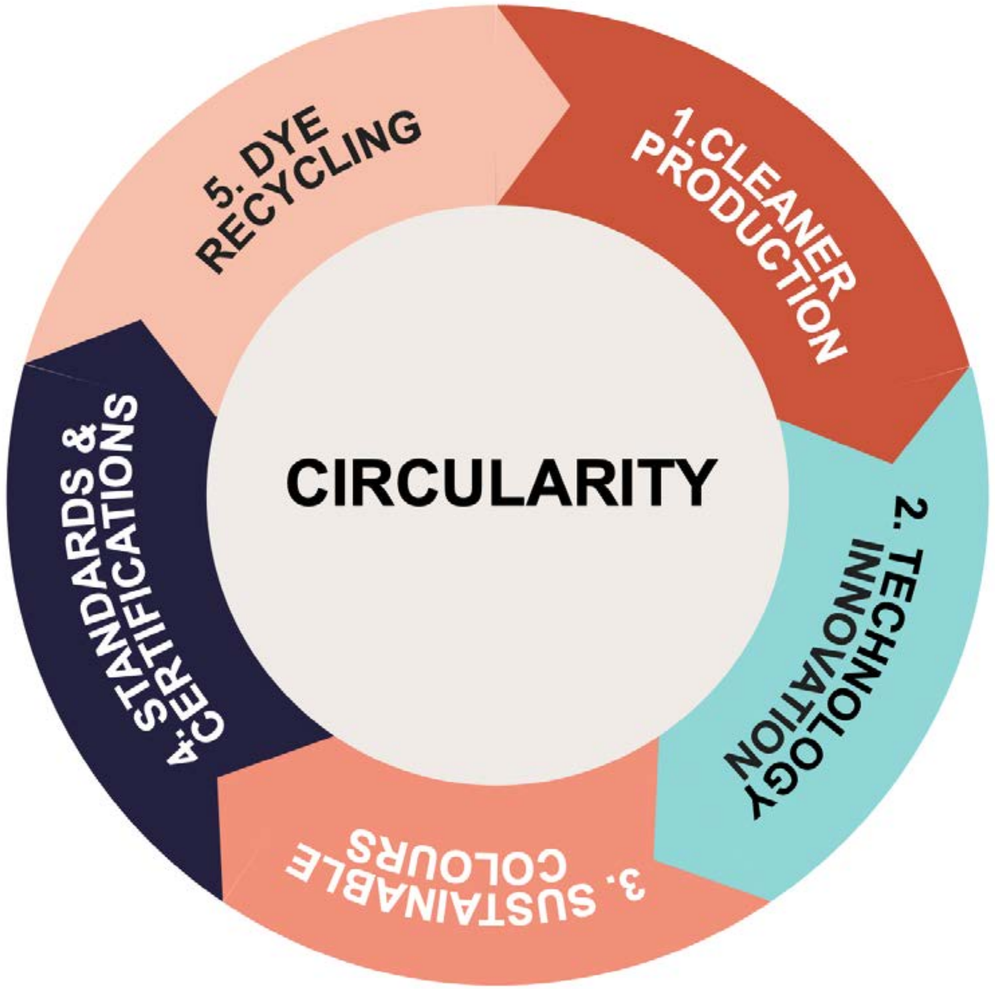
As regulatory pressures increase, businesses need support to stay compliant, particularly in the absence of clear standards and certifications for circular practices. Finally, while innovation is thriving, strategic investment is needed to close technology gaps and accelerate scalable solutions for circular manufacturing.

Innovations in textile and apparel dyeing

CFIN, in collaboration with the Manufacturing Technology Centre (MTC) and leading industry experts, conducted a global review of key innovations in textile and apparel dyeing—one of the most carbon-intensive stages of the fashion and textile supply chain, specifically focusing on wet processing.

The outcome report 'Innovations in Textile and Apparel Dyeing'[23] provides a comprehensive overview of global innovations in textile and apparel dyeing as well as the wholistic approach needed to address sustainability and circularity at this stage of the production process.

The following infographic highlights the journey toward reducing environmental impact in textile and apparel dyeing. It begins with cleaner production—improving efficiency and sustainability in industrial facilities before introducing innovations. Key advancements in dyeing technologies and colouration methods enable more environmentally friendly processes. Industry standards and certifications related to environmental and chemical management play a vital role in guiding best practices and ensuring compliance. Finally, the concept of dye recycling is explored, highlighting the importance of circularity across the entire lifecycle—from dye production through manufacturing, use, and disposal—as a critical strategy for minimising environmental impact.



Innovations in textile and apparel dyeing

TO ADVANCE SUSTAINABILITY IN TEXTILE AND APPAREL DYEING, IT IS ESSENTIAL TO ADDRESS THE FOLLOWING CRITICAL AREAS

Cleaner production

Adopting cleaner production practices consists of taking actions that can minimise the risk towards humans and the environment across supply chains. Reducing environmental impact at this stage can be achieved by integrating pollution management principles, upgrading machinery, using safer chemicals, and improving wastewater recovery and reuse.

Technology innovation

Replacing current technology in industrial facilities to achieve cleaner production is crucial. Consequently, technological innovation in the textile and apparel dyeing sector is emerging.

Sustainable colours

Sustainable colours refer to dyes and pigments used in textile and apparel that are produced and applied in ways that minimise environmental impact. This could mean that these colours use less water and energy usage, are free from harmful chemicals and often come with certifications that ensure the colours meet specific environmental and social criteria.

Standards and certifications

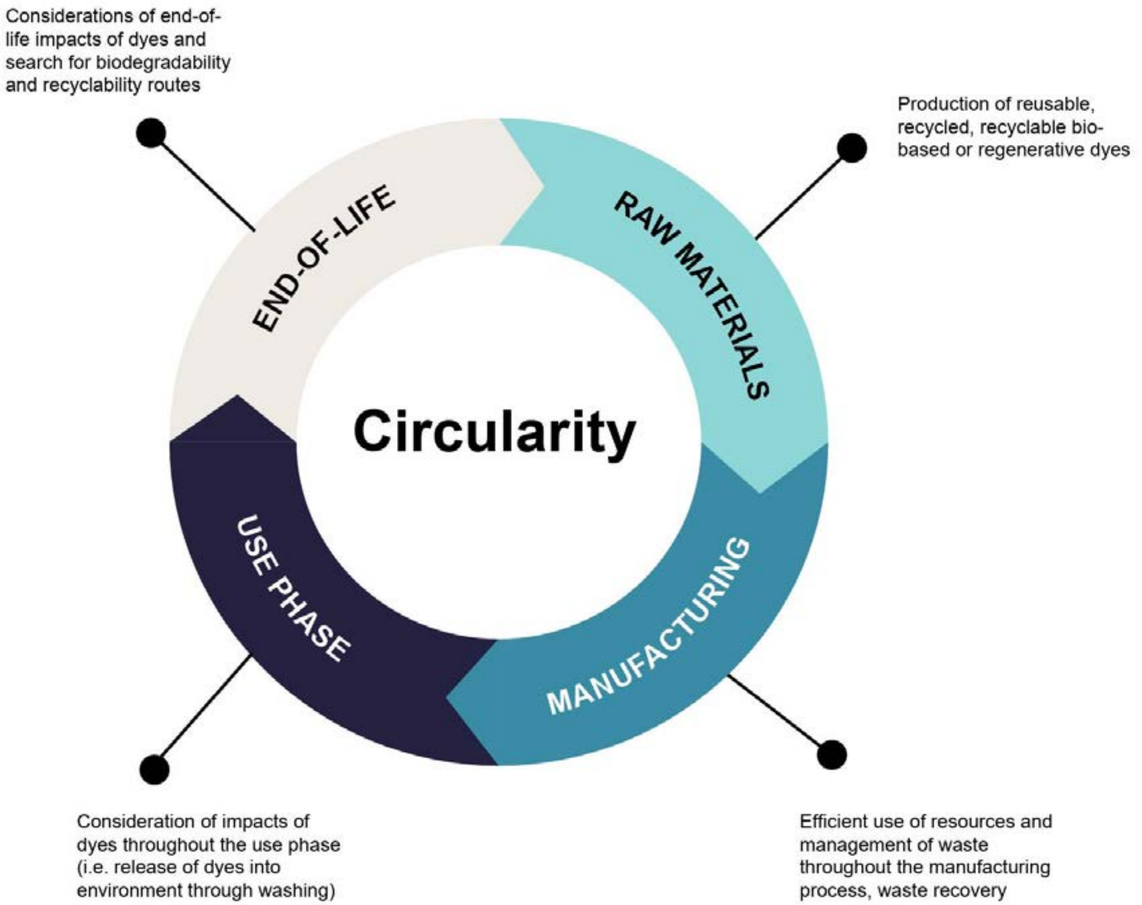
Standards and certifications refer to established guidelines that ensure products and processes meet specific criteria for quality, safety, environmental sustainability and social responsibility. These serve as benchmarks for product and process quality assurance and performance. By adhering to recognised standards, companies can enhance market competitiveness, attract consumers and build credibility in their brand.

Dye recycling

Dye recycling involves the recovery and reuse of dyes from textile waste and wastewater in textile manufacturing and dyeing processes. This practice is important as it reduces environmental impact by preventing the discharge of untreated wastewater containing dyes into water bodies and extending the life cycle of dyes through recycling. Moreover, dye recycling can also facilitate the recycling of textiles.

Circularity

Overall, circularity considerations are essential to reach a sustainable textile and apparel dyeing system.



Sustainability 101 series

In response to identified needs within the industry, CFIN launched the Sustainability 101 series, a set of educational toolkits designed to support UK manufacturers in their journey towards more sustainable operations and processes. Four guides have been published to date.

1. Standards and Certifications Guide

This guide[24] assists manufacturers in identifying which standards are suitable for their business and how to leverage them to improve sustainability performance at both site and product levels. It includes detailed information on the certification requirements for manufacturers working with organic fibres, cotton, wool, and chemical management. By providing this comprehensive overview, the guide enables manufacturers to make informed decisions about which certifications to pursue and effective implementation.

2. Green Claims Guide

This resource[25] supports UK manufacturers in making accurate and reliable statements about their sustainability practices. It explores the Competition and Markets Authority's Green Claims Code and outlines expectations in both UK and global contexts. The guide also provides practical guidance on making compliant green claims through an interactive checklist, helping manufacturers navigate the complex landscape of sustainability communication.

3. Human Rights and Environmental Due Diligence in Supply Chains Guide

This guide[26] focuses on due diligence, its history in business, and information about existing and upcoming due diligence frameworks that could impact UK businesses. It sets out tools and resources for businesses in the industry to implement due diligence in their operations and supply chains, helping manufacturers to proactively address potential human rights and environmental issues.

4. A Guide to Chemical Compliance

The fourth issue[27] of the Sustainability 101 series provides comprehensive guidance on chemical compliance for UK fashion and textile businesses. The guide helps companies navigate key chemical regulations. It offers practical information on applicable standards and certifications, testing guidelines, risk assessment procedures, and includes a glossary of terms. This resource enables businesses to stay informed and compliant with the evolving chemical regulatory landscape in the global fashion and textile industry.

Artificial intelligence in supply chains

Through a CFIN pilot in partnership with ASOS, Manny AI and a UK manufacturer, valuable insights have emerged regarding how AI can enhance the speed, efficiency and sustainability of domestic fashion manufacturing.

The pilot has demonstrated how AI technologies can support key stages of the production process, from a brand and manufacturing perspective, as outlined below:

Enhanced supply chain visibility: Through the creation of a real-time fabric repository, the pilot showed how AI-powered systems can consolidate data from across the supply chain, creating centralised visibility that helps manufacturers and brands track materials, reduce waste and make informed decisions.

Streamlined communication and decision-making: AI tools facilitated seamless collaboration between brand teams and the manufacturer, reducing miscommunication and delays. The critical path collaboration system processed hundreds of comments across pricing negotiations, fit approvals and product discussions, creating a more transparent and efficient decision-making process.

Reduced errors and improved quality: By automating technical specification management and quality requirements through AI-powered tech-pack auto-fill, the pilot demonstrated a 20% reduction in sample remakes due to fit issues, significantly reducing waste and accelerating time to market.

Benefits for UK fashion and textile industry

The application of AI in textile and apparel manufacturing offers benefits that extend across the UK manufacturing ecosystem.

For manufacturers:

- Improved production planning and efficiency through AI-driven scheduling.
- Enhanced capacity utilisation, enabling scaling of operations.
- Ability to handle more complex and varied orders without proportional increases in management overhead.
- Better coordination with material suppliers and logistics partners.

For brands and retailers:

- Faster turnaround times, enabling more agile test-and-repeat manufacturing.
- Improved cost control through better resource allocation and reduced waste.
- Enhanced visibility into factory capabilities and production status.
- More consistent quality through standardised specification management.

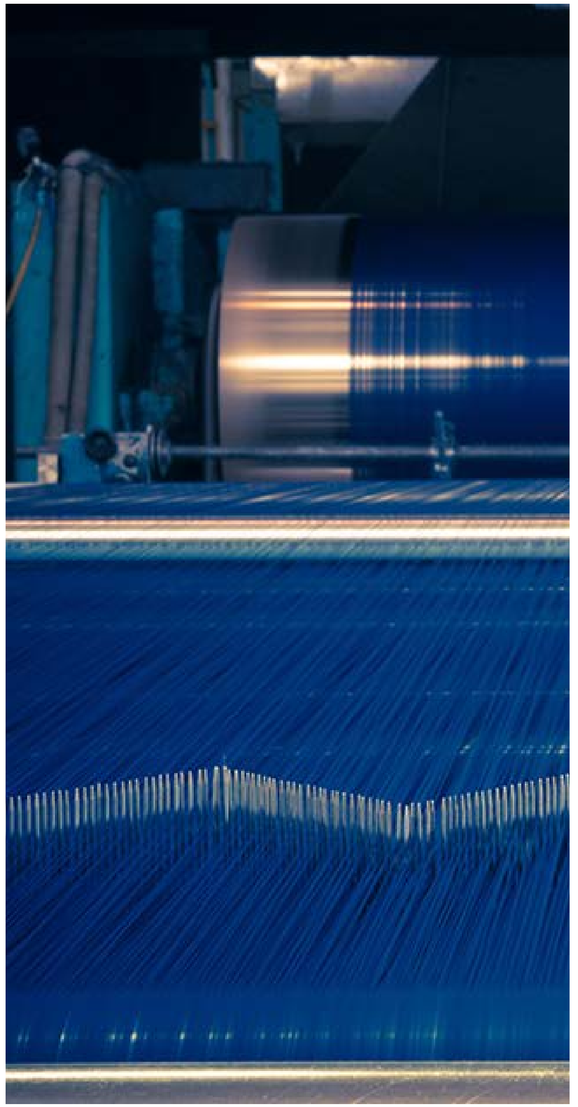
Implementation considerations

While the benefits of AI in manufacturing are clear, successful implementation requires attention to several factors:

Cultural change: Resistance to new technologies can hinder implementation. Manufacturers need to engage employees in the transition, emphasising how AI can enhance their work rather than replace it, creating higher-value roles within the production environment.

Skills development: The successful adoption of AI systems in manufacturing requires upskilling of the existing workforce. This presents challenges, as highlighted in pilot projects where some factory workers initially resisted AI implementation due to concerns about job security. Manufacturers need team members who can operate alongside AI, interpret its outputs and make strategic decisions based on AI-generated insights.

Systems integration: AI tools must be designed to integrate with existing manufacturing systems and processes. Seamless data flow between design, production planning and manufacturing execution systems is essential for realising the full potential of AI.



Responsible supply chains

The complexity of modern supply chains demands rigorous social and ethical standards and transparent practices - particularly as brands, retailers, and consumers place increasing value on responsibly produced goods. CFIN published a report on “Responsible UK Fashion and Textile Supply Chains”[28] based on workshops with brands, retailers, manufacturers, and compliance experts. The research supports UK reshoring efforts by identifying practical solutions to strengthen social and ethical compliance practices within domestic manufacturing.

Based on extensive research, this section examines the current social and ethical compliance landscape in UK manufacturing, key challenges faced by industry stakeholders, and opportunities and recommendations to strengthen ethical practices across the supply chain.

Key findings

The development of this report has resulted in the following findings:

Varying social and ethical compliance expectations

Issues arise around proliferation of varying tools and frameworks for UK fashion and textile manufacturing, with manufacturers currently managing up to 50 different compliance standards and frameworks. Both manufacturers and retailers report challenges navigating multiple frameworks, despite these being fundamentally based on common international standards. This creates significant operational strain and compliance fatigue, with many businesses struggling to resource multiple overlapping systems. In fact, manufacturers require dedicated staff just to manage compliance workload.

Understanding shared responsibilities

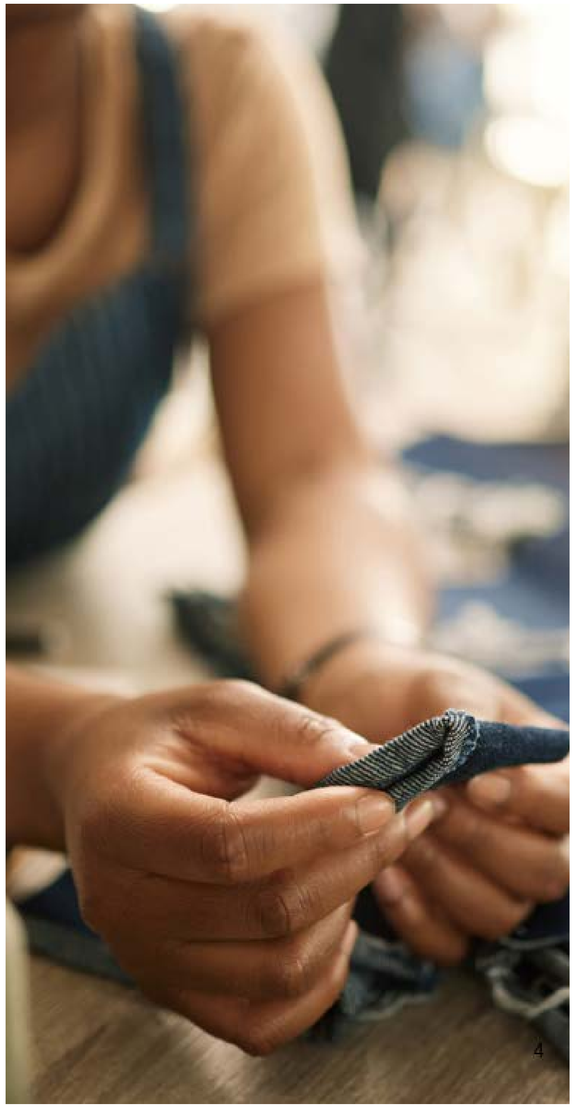
Textile and garment manufacturers agree that a collaborative approach with their clients working towards shared values is essential for success. Retailers typically expect manufacturers to cover their own audit costs, yet success requires investment from both sides. Smaller manufacturers particularly struggle with dedicating sufficient resources to social and ethical compliance management, especially when buyers require specific proprietary verification systems. The sector needs mechanisms that encourage honest dialogue about challenges rather than punitive approaches.

Cost as a critical factor

Hidden social and ethical compliance costs significantly impact overheads and final pricing and pricing pressures can create significant stress that may be a root cause to compromised ethical practices. Buyers show limited understanding of ethical pricing and UK manufacturing cost structures. Many manufacturers have adopted open cost sheet approaches to enable more informed negotiations with their clients. Better understanding is needed of which manufacturing costs must be protected from price negotiations to maintain ethical standards - particularly those directly impacting worker welfare and compliance requirements

Building stronger relationships

Evidence shows relationship-building and ongoing engagement are more effective than audit-heavy approaches. Manufacturers who have adopted transparent approaches report improved relationships with buyers.



Reshoring denim finishing

CFIN is supporting an ongoing collaborative pilot between River Island and LaundRe to demonstrate a circular, onshore production model for denim finishing.

Traditional overseas manufacturing locks brands into 10-month lead times, large minimum order quantities, and reduced visibility. In contrast, LaundRe offers a local, responsive approach where unwashed jeans are finished in the UK with laser-designed patterns and sustainable processing techniques, allowing brands to create trend-led products without committing to high-risk inventory. The pilot demonstrates significant benefits:

- **Rapid design:** Designers and buyers can view, tweak and approve designs in real-time, eliminating multiple rounds of physical samples.
- **Responsiveness:** Moving from concept to shelf in weeks rather than months, reducing markdown risk.
- **Low-volume flexibility:** Applying finishes to small batches (10-500 pieces) for strategic testing.
- **Sustainability:** Reducing carbon footprint through local production and waterless, low-chemical laser finishing technology.
- **Complete transparency:** Enabling oversight of the entire process with ethical production and full traceability.
- **Inventory management:** Transforming existing stock into new seasonal products (e.g., turning palazzos into crops or winter stock into summer shorts).

This proof-of-concept for UK nearshoring presents a future-ready production model that meets the fashion industry's urgent needs for speed, sustainability, and circularity in a post-Brexit environment.

Image credit: LaundRe

Chapter 4

Recycling Infrastructure

Recycling Infrastructure

INTRODUCTION

The following chapter provides an overview of the National Textile Recycling Infrastructure Plan work. The plan is designed to support the UK's transition to a circular textile economy by providing a comprehensive framework for developing a textile recycling infrastructure from 2025 to 2035. It outlines concrete recommendations to drive socio-economic opportunity, foster technological innovation and cultivate skills and workforce capacity, all while promoting environmental sustainability.

PLAN DEVELOPMENT

The development of the National Textile Recycling Infrastructure Plan is based on a comprehensive industry research approach over the programme's two-year period. CFIN has examined challenges and opportunities within the key stages of the textile recycling supply chain, from collection to retail, involving more than 50 businesses and organisations across stakeholder groups: Local authorities, waste management companies, the charity sector, collection merchants, sorters and graders, textile exporters, automated sorting and pre-processing players, textile recyclers, innovators, brands and retailers, industry associations, and government.

The methodology has encompassed a wide range of activities, including industry-wide engagement, stakeholder workshops, direct interviews, field visits, desktop research and a comprehensive literature review. This multi-faceted approach has ensured that the recommendations within the plan are grounded in practical industry insights.

Veolia has served as the theme lead, guiding and directing the work undertaken by CFIN.

As part of the wider Circular Fashion Programme, insights from ACT UK[29] have fed into the development of the National Textile Recycling Infrastructure Plan. UKFT has also taken part in two Network+ projects[30] to develop knowledge for the plan: 'Non-material clothing flows' with University of Leeds as part of Back to Baselines, and 'Unlocking the potential of post-consumer textiles to drive textile reuse and recycling in the UK: assessing post-consumer sorting, grading and feedstock requirements among textile reuse and recycling stakeholders' with University of Leeds and ReLondon as part of the Future Fibres Network. Moreover, UKFT has been working to support the Leeds University-led Back to Baselines Network skills thematic area, with a particular focus on the reuse and recycling sector.

Image credit: Robyn Lynch

Objectives and key pillars

OBJECTIVES

The objectives of the National Textile Recycling Infrastructure Plan are:

1. To present the current status of the textile recycling supply chain across key stages of the post-consumer textile supply chain and stakeholder groups, critically examining current challenges hindering circular progress. It also focuses on opportunities in the four crucial areas of infrastructure, technology, skills and workforce, market capacity and commercial viability, and the role and readiness of government support.
2. To outline a vision with key recommendations for the industry and government for the timeframe 2025-2035, prioritising actions into short-term (1-5 years) and long-term (5-10 years) as implementation phases to inform a strategic roadmap for the development of a robust textile recycling infrastructure in the UK.

KEY PILLARS

The plan is structured around four key pillars that form the foundation of a successful textile recycling ecosystem. These pillars represent the essential elements required to develop a robust infrastructure capable of supporting the UK's transition to a circular textile economy.

Infrastructure

Refers to the underlying physical and organisational structures and facilities that support and enable economic activities related to textile recycling. This includes collection systems, sorting, grading and pre-sorting facilities, pre-processing and automated sorting plants, textile recycling facilities, and logistics networks. These form the foundation of the textile recycling value chain. Infrastructure development requires significant investment and strategic planning to ensure appropriate geographical coverage and capacity across the UK. For optimal efficiency, developing a connected infrastructure where supply-chain stages collaborate and are strategically interlinked is essential, creating an efficient network that facilitates domestic post-consumer textile material flows throughout the UK's textile recycling ecosystem.

Skills and workforce

Refers to the abilities, knowledge, and expertise that individuals possess, allowing them to perform specific tasks or jobs effectively within the textile recycling value chain. Workforce encompasses the people undertaking those jobs throughout the supply chain. Training is particularly important to develop skills and competencies among the workforce, ensuring the sector has sufficient talent to support growth and innovation. As the transition to a domestic textile recycling outlook evolves, the skills and workforce requirements will continue to change. The UK must prioritise skills and workforce development by ensuring individuals within the sector are equipped with the appropriate technical, operational, and analytical skills necessary to meet the emerging demands of a circular textile economy and prepare for future workforce requirements.

Technology

Technology enablers for recycling refer to the technological tools, systems, and tech innovations that facilitate an efficient textile recycling ecosystem. This includes automated pre-sorting technologies, automated sorting and pre-processing technologies, textile recycling technologies or digital platforms that support textile recycling, among others. Technological development is crucial for improving the efficiency, agility, scale and economic viability of a textile recycling infrastructure in the UK.

Market capacity and commercial viability

Refers to the total sales volume or economic value that the textile recycling market can potentially generate over a specific period. Commercial viability refers to the ability of the different stages of a textile recycling supply chain (from collection to incorporation of recycled content in brand and retail offer) to generate profits and sustain themselves in the marketplace over the long term. This pillar addresses the economic aspects of textile recycling, including factors such as collection costs, demand for recycled materials, price competition with virgin materials, and financial models that can create value from textile waste, to name a few.

Government

While not a standalone pillar, government recommendations are considered an essential driver for developing a National Textile Recycling Infrastructure. They hold the potential to create the enabling conditions needed across all four pillars, from supporting infrastructure investment to incentivising market demand for recycled content. Throughout this plan, government recommendations are integrated as a cross-cutting theme that influences the development of all aspects of the textile recycling ecosystem.

Innovation

While not a standalone pillar, innovation is recognised as a critical enabler in the development of a National Textile Recycling Infrastructure. It drives progress across all four pillars, from alternative collection models to advancing infrastructure technologies or new business models that stimulate demand for recycled materials. Throughout this plan, innovation is woven in as a cross-cutting theme.

Background and landscape of UK textile recycling

The UK holds a long tradition as a leading country in the fashion and textile industry. It now stands at a pivotal moment, alongside global supply chains, to redefine its future outlook and reshape how supply chains will operate within a circular economy. The world is transitioning from a linear to a circular model, presenting an opportunity for socio-economic growth beyond the manufacturing and retail of fashion and textiles. This shift expands supply chain capabilities to include end-of-life, where textiles are captured and brought back into circulation, recovering economic and resource value and generating new circular markets that can drive growth in both the UK and global economies.

As a country with one of the highest rates of fashion and textile consumption globally, generating significant volumes of textile waste that serve as valuable raw material for circular systems. While reuse presents the preferable waste management strategy in accordance with the waste hierarchy, a third of the current textile waste stream consists of non-rewearable textiles (NRTs) that cannot be reused due to quality, damage, or lack of market demand, among others. Finding effective solutions for these non-rewearable textiles is an essential step to achieving a truly circular system.

Currently, the UK primarily exports post-consumer textiles for sorting and grading elsewhere, failing to maximise the value of processing non-rewearable textiles domestically. By keeping more of these materials within the UK, there is significant opportunity to capture their resource value, shorten supply chains, and secure a domestic resource base.

Developing circular systems would increase the UK's competitiveness, generate socio-economic opportunities, reduce dependence on global markets, and support climate and net zero carbon ambitions.

While Europe, the US, and Asia advance powerfully in the textile circularity transition, the UK risks falling behind. This moment presents a crucial opportunity for the UK to position itself as a leader in textile recycling and stay competitive.

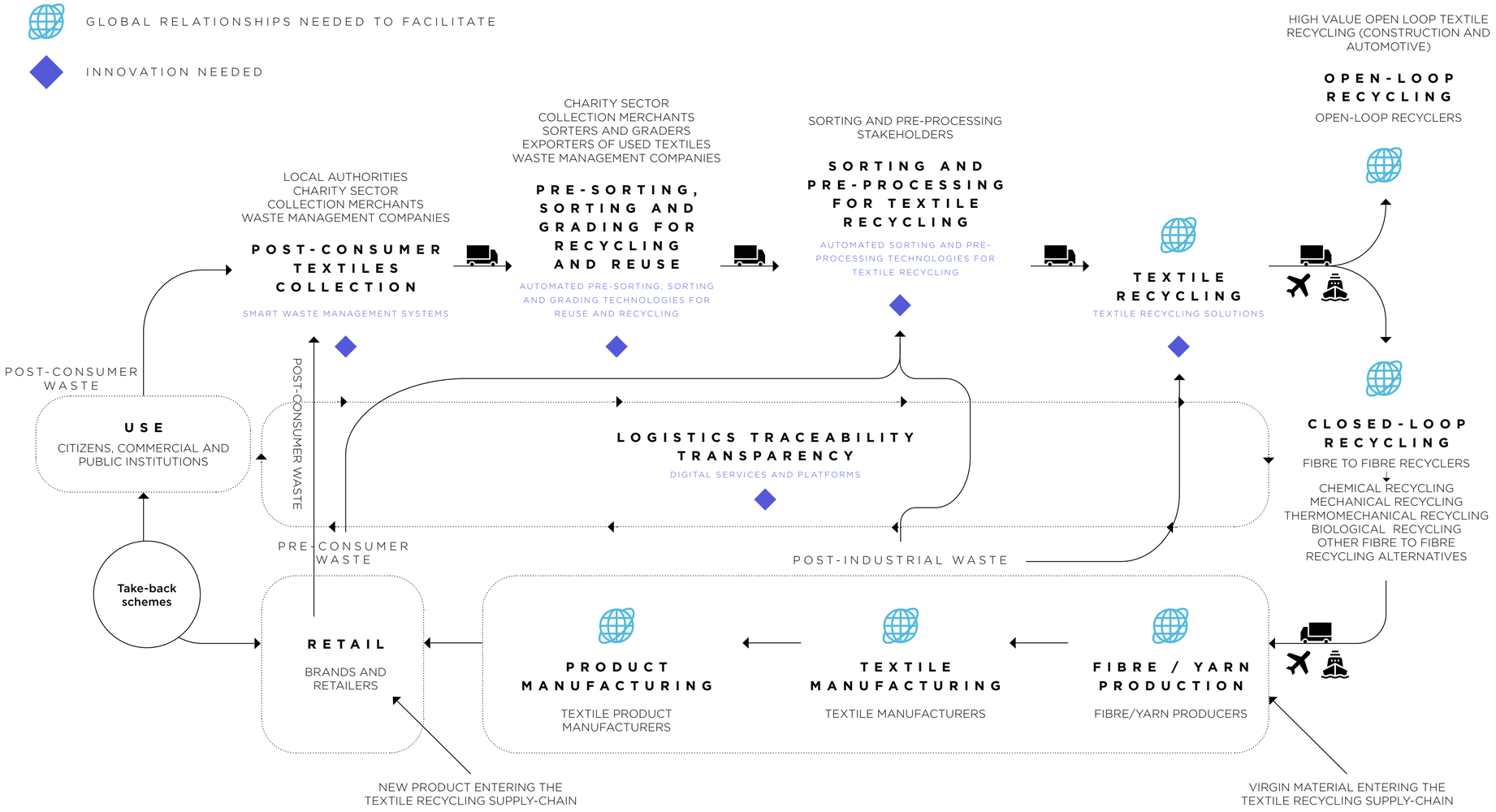
Meanwhile, the legislative landscape is changing. The European Union is rolling out eco-design, EPR, and separate collection of textile waste requirements. As of January 2025, all EU member states must implement separate textile waste collection systems. This initiative aims to reduce textiles in general waste, minimise contamination, improve sorting infrastructure, and increase recycling rates while securing more consistent feedstock. The EU has further strengthened its commitment through the Ecodesign for Sustainable Products Regulation (ESPR)[31], which came into force in July 2024. Additionally, European governments are implementing EPR schemes to incentivise industry stakeholders to create more durable products that are easier to recycle and reuse. Hence, developing a robust textile recycling infrastructure also implies staying ahead of upcoming legislative requirements.

Importantly, achieving textiles circularity cannot rely solely on traditional methods, skills, and technologies, nor traditional supply-chain reconfigurations. New systems thinking, business model innovation and technological innovation must play a central role across the entire textile recycling supply chain. The UK has a significant opportunity to implement innovations developed globally and foster innovation domestically.

The vision: UK textile recycling landscape

CFIN has developed a vision of the UK Textile Recycling Infrastructure Landscape in the next decade, focusing on NRTs. A unified and integrated supply chain with collaboration across stages is required to build an economically viable circular system for NRTs. The visual below showcases the outlined vision of CFIN for the next decade.

Every stakeholder has a role in building domestic capabilities for textile recycling. While the UK already has, to some extent, established infrastructure for collection, sorting, grading and pre-sorting, there is a pressing need to expand capacity in automated sorting, pre-processing, and recycling. Acknowledging the global interdependencies and collaboration required to make this supply chain effective and economically viable is equally important. Efficient logistics and robust traceability systems will be central to its success. Innovation will be a driving force throughout the system, from smart waste management solutions to advancements in pre-sorting technologies, to automated sorting and pre-processing technologies, fibre-to-fibre recycling, as well as the development of enabling platforms and services for all stakeholders.



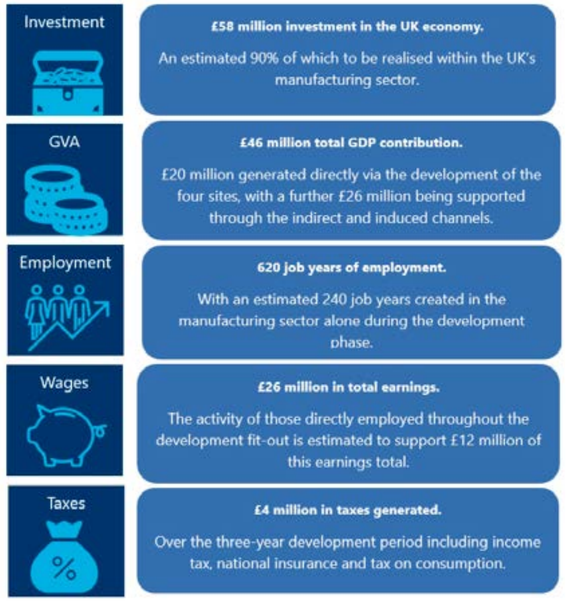
Socio-economic impact

Together with Oxford Economics and key textile recycling stakeholders, CFIN has undertaken a modelled socio-economic impact study titled 'A Vision for a National Textile Recycling Hub in the UK' as part of the plan development. Whilst the socio-economic impact study considers only a fraction of the textile recycling supply chain, it demonstrates the potential significant socio-economic benefits that textile recycling could bring to the UK.

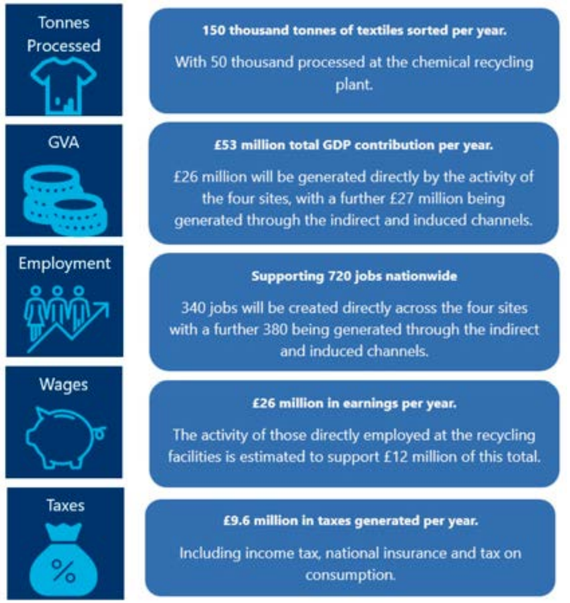
The proposed model of a National Textile Recycling Hub was built on the development of three automated sorting and pre-processing plants (ATSPs), alongside an upstream textile chemical recycling plant in the UK. The ATSPs would be spread throughout the UK—with the East Midlands, North West and South West regions being selected as potential site locations. The accompanying chemical recycling facility would then be developed in the East Midlands.

The development phase of the proposed model for a National Textile Recycling Hub would commence in 2025, spanning three years to 2028. The chemical recycling plant would then come on-stream in line with phased capacity rollout across the ATSP sites, with all plants reaching full operational levels by 2031. Once fully operational, the proposed three sorting sites are envisaged to have the capacity to pre-process nearly 150 thousand tonnes of textile waste, with 50 thousand tonnes being subsequently recycled for new clothing fibres via the chemical recycling plant. The remaining 100 thousand tonnes would be channelled into other textile recycling that, whilst not included in the scope of this socio-economic impact analysis, would generate additional socio-economic impact for the UK. The modelling shows that the National Textile Recycling Hub is expected to amount to a £277 million investment—with £58 million of this total realised within the UK. Key findings on a national level of both the development and operational phases are outlined in the figures below:

Development phase related benefits, UK, 2025-2028



Operational phase related benefits (fully phased), UK, 2031



In addition to the economic benefits highlighted, it is also important to consider the wider catalytic and environmental benefits. While these can be more difficult to quantify, they will likely significantly impact the UK economy and green policy objectives.

The proposed textile recycling hub analysis results demonstrate that this development could support significant socio-economic benefits throughout the UK during both the development and operational phases.

Key stages, opportunities and recommendations

The following section summarises opportunities and recommendations throughout each stage of the textile recycling supply chain. These will be further expanded in the National Textile Recycling Infrastructure Plan, which CFIN will publish in June 2025.

POST-CONSUMER TEXTILE COLLECTION

This stage refers to collecting the textiles donated or disposed of by the general public (GP), industrial, commercial and public institutions, to effectively manage these textiles. This includes both rewearable textiles (RT) and NRTs textile waste which, later in the chain, is redistributed to key stakeholders that decide upon waste management strategies or end markets for these textiles.

In the UK, the key stakeholders in the textile waste collection stage are local authorities, the charity sector, textile collection merchants, waste management companies, brands and retailers, the GP, industrial, commercial and public institutions.

Key opportunities include the following:

- There is a need to build a dedicated textile waste management ecosystem focused on diverting post-consumer textiles from residual waste and increasing domestic processing of NRTs and recycling rates. This includes enhancing collection infrastructure by leveraging existing systems, ensuring convenient, segregated textile collection that reduces contamination and damage of textiles, and reconsidering the flows of NRTs across the current system.
- Educating the GP, industry, and institutions—starting from schools and extending to local authorities—on the topic is essential to improve textile recovery and recycling rates.
- Technology plays a key role, with opportunities to implement smart waste management systems to optimise reverse logistics and digital platforms that guide end-of-life decision-making and unlock the hidden value in NRTs. Improved collection, tracking, monitoring and reporting on post-consumer textile flows will also enhance decision-making.

Government recommendations

- **Prioritising textiles as a key waste stream among residual waste:** Incorporating KPIs beyond volume (e.g. ETS mechanism for waste management). This suggests a shift is needed from weight-based targets towards climate-based and net zero targets.
- **Revisit current local authority strategies for textile waste management:** This review should aim to manage textile waste for reuse and recycling purposes more effectively. It's essential to ensure stakeholders have access to appropriate infrastructure that encourages disposal beyond residual waste in ways that promote textile reuse and recycling. This presents an opportunity to develop Action Plans (frameworks for local policy/regulation infrastructure) for local authorities on effective post-consumer textile waste management, and revisit existing partnerships and contracts with the relevant collection and textile waste management stakeholders to ensure they meet reuse and recycling criteria.
- **Improved licensing and environmental permissions for waste management:** Revisit the UK's licensing process for textile waste management and strengthen the required environmental compliance standards.
- **Training for local authorities:** Provide targeted training for local authorities regarding textile waste management, reuse and recycling strategies.
- **Consumer awareness campaigns:** Funding national campaigns to promote proper textile disposal/donation and increase reuse and recycling rates.
- **School education programmes:** Funding and promoting school education programmes on textile reuse and recycling across the UK.
- Provide financial support for local authorities to enhance education programmes. This could mean transition funding until an EPR system is in place that can partially fund this.
- Revisit current data collection and reporting requirements of post-consumer textile management and develop a standardised and stringent reporting method to increase accuracy and transparency of textile waste collected and EoL management to better support evidence-based decisions.
- Consider mandatory separate waste collection for local authorities in harmonisation with current EU regulations implemented in 2025.
- Establish an obligation for commercial and public institutions to collect textile waste.
- To implement an EPR scheme to generate consistent funding streams to support reuse and recycling ambitions at the collection stage (e.g. funding of nationwide education campaigns to increase reuse and recycling rates).

Key stages, opportunities and recommendations

POST-CONSUMER TEXTILE MANAGEMENT

This stage refers to textile collection before reuse, recycling, incineration or landfill. This includes both RT and NRT post-consumer textiles and textile waste. At this point, the relevant stakeholders separate, sort, grade, pre-sort, and pre-process the post-consumer textiles with the intent for domestic reuse, international reuse, domestic recycling, international recycling or domestic or international end-of-life (EoL) in response to end-market demand and economically viable options. The sorting and grading of post-consumer textiles particularly characterises this stage.

In the UK, the key stakeholders in the textile waste management stage are collection merchants who separate, sort and grade; sorters and graders; exporters of used textiles, the charity sector, and sorting and pre-processing stakeholders.

Key opportunities include:

- Leverage existing domestic infrastructure for sorting, grading and pre-sorting of post-consumer textiles.
- Build new capacity for automated sorting and pre-processing for textile recycling.
- Encourage traditional stakeholders to overcome resistance and collaborate with new solutions.
- Secure consistent feedstock for scaling automated sorting and pre-processing.
- Foster global collaboration with textile recycling and production hubs.
- Rethink inefficient flows of non-rewearable textiles (NRTs) to improve system efficiency.
- Support the UK's growing SME textile recycling network to absorb more NRTs.
- Invest in workforce development through apprenticeships and standardised training.
- Embrace hybrid sorting systems that merge manual skills with technological development.
- Implement automated pre-processing sorting systems to scale textile recycling.
- Improve accuracy in material composition recognition and separation.
- Prepare feedstock for a scaled textile recycling system.

Government recommendations

- Government needs to focus on supporting the UK Sorting and Grading sector, as it plays a critical role in enabling circular supply chains by keeping post-consumer textiles (particularly NRTs) in the UK.
- Funding could reinvigorate the manual sorting and grading industry, particularly by supporting operational costs and labour. Since textile sorting and grading is cost and labour-intensive, this would help bring more of the sorting and grading process back to the UK, improving quality control and job creation.
- Revisit current NRTs export rules. Make the process of non-rewearable textile export more stringent, to ensure NRTs are kept and processed in the UK.
- Transition funding for the development of automated sorting and pre-processing infrastructure. This could mean transition funding until an EPR system is in place that can partially fund this.
- To implement an EPR scheme to generate consistent funding streams to support recycling ambitions at the textile management stage, focusing on developing automated sorting and pre-processing infrastructure.
- Incentivisation of better design through eco-design requirements to stimulate increase in demand for recycled content which includes NRTs with UK origin.

Key stages, opportunities and recommendations

TEXTILE RECYCLING

Textile recycling refers to the process of converting textile waste into new materials or products and can be either closed-loop or open-loop. Closed-loop recycling refers to the recycling of materials from one industry to create outputs for use in the same industry, and more concretely, fibre-to-fibre recycling is a recycling process in which collected textile waste is processed into recycled textile fibres. Open-loop recycling refers to the recycling of materials where inputs from one industry are recycled into outputs for another industry.

The key stakeholders in textile recycling are closed-loop fibre-to-fibre recyclers, including mechanical recyclers, chemical recyclers, thermomechanical recyclers, biological recyclers, and others, as well as open-loop recyclers (e.g. wiper merchants or shredding services).

Key opportunities include:

- Support technologies capable of recycling complex material blends.
- Develop automated sorting and pre-processing infrastructure.
- Ensure consistent, high-volume feedstock for scaling recycling operations.
- Maintain quality standards in recycling processes.
- Transition from low-value to high-value open-loop recycling.
- Reintroduce recycled fibres into premium industrial, automotive, or consumer applications.
- Collaborate with global textile recycling hubs.
- Ensure access to market pathways for sorted NRTs.
- Embed traceability mechanisms within the system.
- Track and verify the origin of recycled content.
- Enhance credibility and transparency of recycled materials.
- Collaborate with end markets, textile producers and brands to drive demand.

Government recommendations

- Incentivisation of better design through eco-design requirements that promotes the use of UK-made recycled content and consequently stimulates demand for recycled content.
- To implement an EPR scheme to generate consistent funding streams to support recycling ambitions at the textile recycling stage, focusing on developing textile recycling infrastructure. The use of eco-modulated fees will be essential to incentivise the production and use of recycled content in the UK.
- Fund and support R&D initiatives aimed at advancing fibre-to-fibre textile recycling technologies and solutions within the UK.
- Fund and support R&D initiatives aimed at advancing open-loop textile recycling solutions within the UK.
- Support investment to scale textile recycling in the UK, building on the foundation of established automated sorting and pre-processing capabilities to create a fully integrated recycling ecosystem.

Key stages, opportunities and recommendations

MANUFACTURING OF RECYCLED CONTENT

Manufacturing of recycled content refers to using recycled fibre for spinning yarn, weaving and knitting of fabric, and apparel manufacture. The manufacturing of recycled yarn can become a crucial link in a supply chain that works with the unified purpose of collecting textile waste, sorting and pre-processing it, recycling it, and manufacturing it for closed-loop and open-loop applications.

The key stakeholders and their main responsibilities in manufacturing recycled content are yarn manufacturers, fabric producers and apparel manufacturers.

The UK has historically been a global leader in manufacturing fibres, textiles, and leather. However, today, the manufacturing of fibres, textiles, and leather is more limited than manufacturing fashion and textile goods. While manufacturers of fashion and textile goods created an estimated 3.6 billion gross value-added contribution to UK GDP in 2021, manufacturers of fibres, textiles, and tanners generated a combined £980 million. Very few yarn spinners are left in the UK, with no commercial-scale cotton spinning, which poses a significant challenge. This difference highlights the disparity between the UK's current capacity to manufacture fibres and textiles and its capacity to produce finished fashion and textile goods. While the gap is considerable, these figures also show that the manufacturing of fibres and textiles already contributes to the growth of the UK economy.

Key opportunities include:

- Recognise the limited but valuable foundation of current UK manufacturing capacity.
- Build upon this foundation for future growth in the domestic textile recycling ecosystem.
- Position the UK's textile manufacturing sector to lead in circular and sustainable production.
- Pursue reshoring of recycled content manufacturing with careful socio-economic consideration.
- Establish manufacturing as the final link in a fully circular domestic supply chain.
- Foster international partnerships with global production hubs in the interim.
- Explore immediate open-loop applications for recycled fibres within the UK.
- Leverage existing shredding services and redirect feedstock to alternative industries.
- Expand R&D to improve quality and consistency of recycled content outputs.
- Develop a skilled workforce with expertise in recycled content production.
- Build a strong business case for commercial viability.
- Compare costs with virgin materials and overseas manufacturing.
- Explore new market opportunities and assess export potential.

Government recommendations

- Incentivisation of better design through eco-design requirements that promotes the use of UK-made recycled content.
- Fund and support R&D initiatives aimed at assessing the feasibility of closed-loop manufacturing using recycled materials in the UK.
- Fund and support R&D initiatives aimed at exploring the viability of producing high-value products through open-loop recycling in the UK.
- Support investment to scale manufacturing of recycled content in the UK, following the development of automated sorting, pre-processing, and textile recycling facilities.

Key stages, opportunities and recommendations

RECYCLABLE AND RECYCLED CONTENT END MARKETS

In a brand and retail context, recyclable and recycled content refer to two key aspects of a company's circular strategy. Recyclable content means the products a brand sells are designed to be recyclable at the end of their life. Recycled content means the products are made with materials that have already been recycled. The use of recyclable and recycled content in the UK is essential to create domestic circular markets.

The key stakeholders and their main responsibilities in the incorporation of recyclable and recycled content are fashion and textiles brands and retailers, as well as other industry markets (e.g. automotive, construction).

Key opportunities include:

- Support brands navigating the transition to circular material choices.
- Provide clear direction, training, and guidance for brands.
- Train design and product development teams in textile recycling.
- Ensure new products are both recyclable and contain recycled content.
- Drive research and development to meet consumer quality expectations.
- Make recycled materials cost-competitive with virgin alternatives.
- Encourage brands and retailers to make commercial commitments to recycled content.
- Educate consumers to build demand for recycled products.
- Explore alternative open-loop end markets while closed-loop materials scale.

Government recommendations

- Encourage better product design by introducing eco-design requirements that promote the use of UK-made recycled content as well as recyclability of products.
- Fund and support R&D initiatives aimed at assessing the feasibility of incorporating recycled content into brand and retail offer.
- Fund and support R&D initiatives aimed at exploring the viability of producing high-value products through open-loop recycling.
- To implement an eco-modulated EPR scheme to incentivise the use of recyclable and recycled content in the product offer.

Image credit: Robyn Lynch

Innovation review

In recent years, the UK's innovation landscape in post-consumer textile supply chains has seen steady growth, especially in the management and processing of NRTs. At the same time, similar innovation trends have emerged globally, with momentum around automated sorting and fibre-to-fibre recycling technologies. While technological advancements remain the primary drivers of progress in textile recycling, our review of the innovation landscape also highlights the importance of exploring new processes, systems, and ways of working—extending beyond technology alone. Despite the increase in innovation in the sector, there remains significant opportunities for further innovation, which need to be addressed to develop a circular textiles ecosystem in the UK.

SOME KEY AREAS OF INNOVATION INCLUDE:

1. NRTs post-consumer textiles collection

Innovations in the stage of post-consumer textile collections are focused on increasing the amount of post-consumer textiles diverted from residual waste (with a particular focus on NRTs) and making it available for utilisation as recycling feedstock, as well as making textile waste management collection more efficient and optimised. This includes innovation in: smart waste management, NRTs take-back solutions, new pre-sorting methods (into RTs and NRTs), digital platforms that connect textile waste collectors with end-of-life solutions or peer-to-peer platforms to exchange low quality post-consumer textiles.

2. Automated sorting and pre-processing

Innovations at this stage are focused on technologies that enable automated sorting in order to streamline the sorting process, both sorting for reuse and sorting for recycling. This includes innovations in pre-sorting and identification of RTs and NRTs, fibre identification technologies, as well as innovative automated sorting and pre-processing business models. Innovations in pre-processing include removal of disruptors (buttons, zips etc.), removal of dyes or design for disassembly.ed sorting and pre-processing business models.

3. Fibre-to-fibre recycling

Innovations at this stage are focused on the ways that NRTs can be processed back into new fibres. The type of fibre-to-fibre recycling used is dependent on the type of fibre. Various methods can be used, including mechanical, thermomechanical, chemical and biological recycling, to name a few. Although some of these methods have been used for many years in the textile industry, there are innovations emerging that seek to find novel and efficient solutions, including for different types of fibres and blends.

4. Traceability

Traceability within the textiles supply chain means that brands and textile producers can oversee the origins of materials and processes carried out to manufacture a recycled product. There are innovations within the area of traceability which can be used to support a circular textiles ecosystem. Tools such as Radio-Frequency Identification (RFID) and DNA markers are used to trace garments from manufacture to disposal.

Chapter 5

Novel Technology

Novel Technology

INTRODUCTION

Novel technologies are critical enablers of the UK's transition to a circular fashion ecosystem. Innovations in materials, automation, traceability and recycling address challenges throughout the textile value chain—from design and production to end-of-life management.

The development and adoption of novel technologies for circularity is particularly timely in the UK context. With growing regulatory pressures, increasing consumer demand for sustainable products, and the need to strengthen domestic manufacturing capabilities, technological innovation is essential to maintain competitiveness in a rapidly evolving industry landscape.

This chapter explores the role of emerging technologies in enabling circular fashion at scale, drawing on insights from CFIN's Novel Technology Showcase[9], which brought together innovators, investors and industry stakeholders to accelerate the adoption of game-changing circular solutions.

SUMMARY OF KEY ACTIVITIES

CFIN has worked with innovators, investors and industry partners to identify, evaluate and showcase promising technologies that can accelerate the transition to circular fashion.

CFIN Novel Tech Showcase: Circular Fashion

In March 2025, CFIN hosted the *"CFIN Novel Tech Showcase: Circular Fashion"* in partnership with Climate Connection. This event connected innovative circular fashion startups with leading investors and corporate partners, providing a platform for selected companies to present their groundbreaking solutions to key decision-makers.

The showcase featured innovations across four critical areas.

- **End-of-life solutions:** Technologies addressing the recovery, recycling and repurposing of textile waste.
- **Repair solutions:** Innovations that extend product lifespans through novel repair approaches.
- **Technology for circularity:** Digital and physical tools that enable circular business models.
- **Re-commerce:** Platforms and technologies that facilitate second-hand trading and product recirculation.

CFIN carefully selected eight innovators (two per category) based on their commitment to sustainable innovation and clear potential for scaling their solutions. The event facilitated meaningful connections between innovators and potential partners, investors and customers, helping to bridge the gap between promising technologies and practical implementation.

The role of emerging technology in circular fashion

Stakeholders from across the fashion ecosystem—including brands, manufacturers, innovators, and investors—identified several key technology areas during the CFIN Novel Technology Showcase. These innovations are now approaching the maturity needed to support circular fashion at scale:

Automation and AI

Robotics, machine learning and image recognition are streamlining some of the most manual and costly processes in circular systems, including resale, rental, sorting and disassembly. These technologies are addressing operational barriers that have historically limited the financial viability of circular business models by reducing labour costs and increasing processing efficiency.

Digital Product Passports (DPPs)

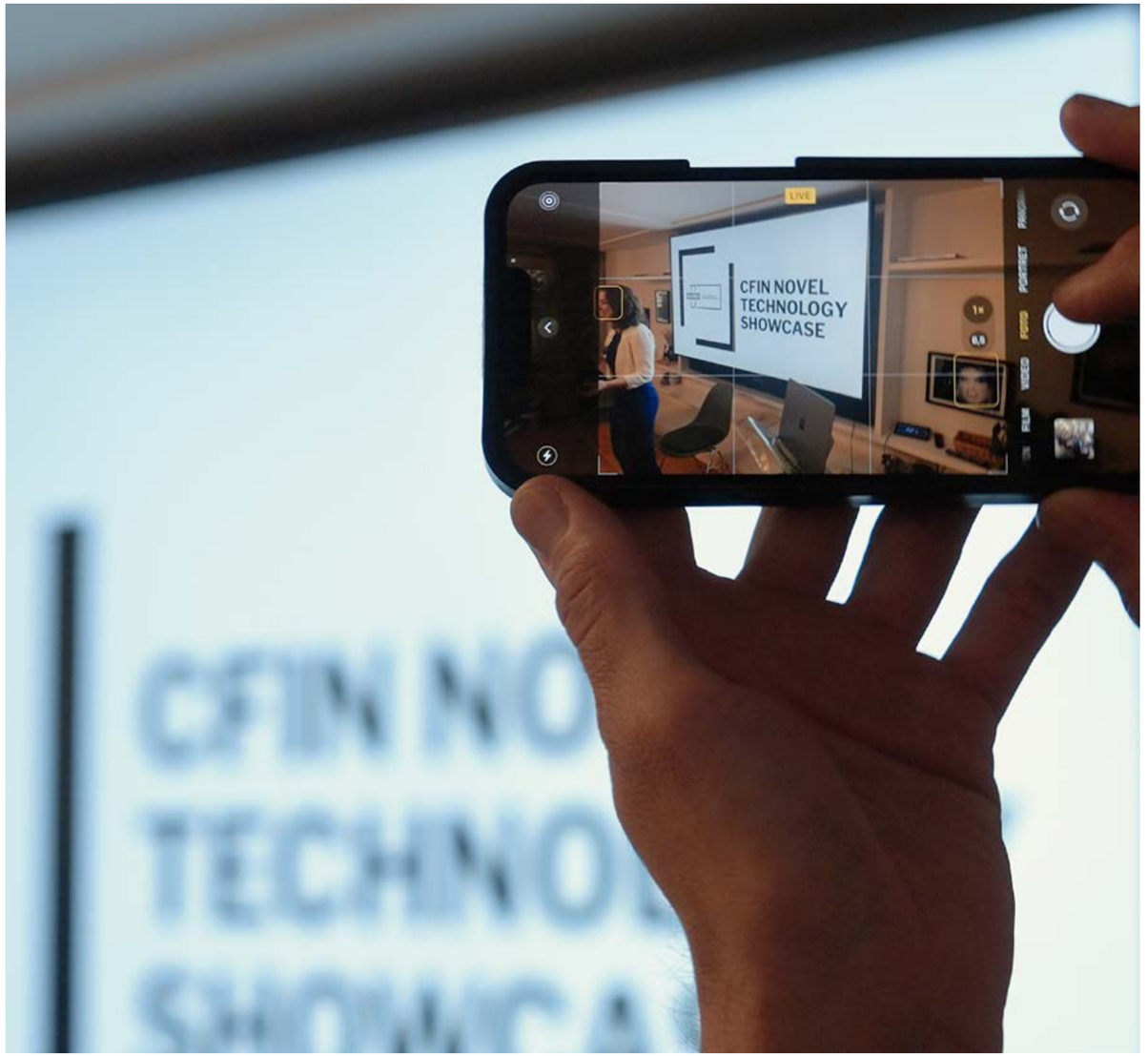
DPPs offer transparency into product provenance, enabling consumers and brands to trace ownership, materials and lifecycle events. These digital tools create the foundation for informed circular decision-making by providing accessible information about a product's composition, history and potential future pathways.

Forensic and geospatial tools

Technologies such as fibre tracing and satellite monitoring are being used to authenticate supply chains, flag unethical practices and support smarter material recovery and sorting. These tools are enhancing transparency and accountability throughout textile value chains, creating the trust necessary for circular models to flourish.

Advanced recycling and regenerative systems

Fibre-to-fibre recycling, chemical recycling and regenerative agriculture were highlighted as transformative technologies for reducing virgin resource use and closing material loops. These innovations are addressing fundamental challenges in resource efficiency and waste management that are essential for true circularity.



Barriers to scaling circular innovation

Despite the promise of these technologies, several practical challenges hinder their widespread adoption.

OPERATIONAL COMPLEXITY

Reverse logistics, lack of automation and expensive manual processes make many circular services financially challenging:

- Collection costs: The expense of gathering used textiles from consumers.
- Sorting inefficiencies: Lack of automated systems for identifying materials.
- Fragmented systems: Disconnected technologies that don't share data effectively.
- Infrastructure gaps: Insufficient recycling facilities in proximity to retail centres.

Participants noted that these challenges are particularly acute for mid-market and value retailers, where product margins are tighter.

INTERNAL CAPABILITIES AND INVESTMENT CONSTRAINTS

Many brands face internal barriers to implementing circular technology:

- Limited expertise in circular business models.
- Pressure on profit and loss statements discouraging long-term investment.
- Overreliance on third-party providers rather than developing in-house capabilities.
- Difficulty making the business case when benefits are distributed across departments.
- As one participant noted, *"Many innovations are available but lack internal investment—brands face P&L pressure that makes circular initiatives difficult to justify."*

COST VS. VALUE PERCEPTION

The economics of repair and recycling remain challenging in some market segments:

- For lower-priced garments, repair often costs more than replacement.
- Small-scale recycling struggles to compete with virgin material prices.
- Brands hesitate to pay premiums for circular processes.
- Traditional accounting methods don't capture full benefits of circularity.

The breakout sessions revealed a clear divide between luxury and mass-market approaches, with participants noting that *"lower-value garments have tighter margins, making circularity harder than with high-ticket items."*

COMMUNICATION AND REGULATORY UNCERTAINTY

Brands face challenges in communicating their circular initiatives:

- Fear of greenwashing accusations leading to *"greenhushing"*.
- Uncertainty about evolving regulations.
- Disconnect between technical sustainability terms and consumer understanding.
- Difficulty measuring and verifying circular claims.

This has created a communication gap where "brands know circularity matters but struggle to communicate due to greenwashing fears."

Conclusion and recommendations

Novel technologies offer transformative potential for circular fashion, but unlocking their impact requires more than innovation alone. While the tools for transformation already exist, their widespread adoption depends on creating supportive conditions across multiple areas. Based on the showcase findings, we recommend strategic action in four key areas:

POLICY FRAMEWORKS

EPR should be implemented to shift accountability for product end-of-life back to brands and stimulate investment in takeback and recycling infrastructure. Government-backed incentives, integration into smart city infrastructure, and clearer regulations would accelerate adoption and provide the certainty needed for long-term investment in circular systems.

FINANCIAL ECOSYSTEM

To address the funding gap where many circular innovations stall after early-stage investment, the sector needs more long-term, growth-focused capital. Financial institutions should develop specialist knowledge of circular business models and their unique timelines, while brands should allocate dedicated innovation budgets for circular technology implementation. Investor education about the distinctive value and timeline of circular business models is essential for bridging this gap.

MEASUREMENT AND EVALUATION

A more robust framework for evaluating circular innovations would help attract mainstream investment. Beyond traditional financial metrics, this should incorporate:

- Environmental impact metrics (waste diverted from landfill, carbon reduction).
- Business performance indicators (resale margins, consumer loyalty).
- Brand value assessments (reputation, risk reduction, market differentiation).
- Circularity scores that evaluate material flows and lifecycle extension.

COMMUNICATION STRATEGIES

To bridge the gap between sustainability commitments and consumer engagement, brands should develop:

- Clear, transparent messaging that translates technical sustainability concepts into relatable consumer benefits.
- Confident storytelling that moves beyond defensive communication.
- Marketing approaches that integrate sustainability with core product attributes of style, quality and value.
- Communication frameworks that align with evolving regulations like the EU GCD.

Strategic alignment between finance, policy, operations and communication is critical to mainstream adoption. As technology matures and consumer demand evolves, coordinated action across these areas will build the infrastructure, partnerships and narratives needed for a circular fashion future.

CASE STUDY

Amphico - Challenges in scaling next-gen material innovations


Image credit: Amphico

Amphico, a London-based material innovation startup that spun out of the Royal College of Art, exemplifies both the challenges and opportunities facing next-generation sustainable material developers in today's fashion industry. The company, now a team of 14 spanning design and science disciplines, has developed two key innovations: an Amphitex PFAS-free waterproof, breathable membrane for performance textiles, and Amphicolor, a waterless textile dyeing solution that addresses water consumption and chemical usage.

Key challenges

Despite significant interest from outdoor, luxury, and mid-market fashion brands, Amphico faces several barriers to scaling their innovations:

- The gap between brand interest and actual commitment.
- Capacity constraints as a small team.
- Extensive technical documentation demands from corporates.
- Mismatched expectations regarding development timelines.
- Inconsistent regulatory pressure across environmental issues.

"We're used to being agile and experimental, while brands often have a checklist of requirements—like LCAs or certifications—that take time and money to develop," explains Claire Miller, Principal Textile Designer at Amphico. This creates a fundamental tension where startups need commercial uptake to fund certification, yet brands require certification before adoption.

Collaboration opportunities

When asked what support would make corporate collaborations more effective, Claire says: *"Financial support is huge—but also clear strategic direction. Knowing what product line a brand wants to use the material for, or what volumes they're thinking about, would help us align our R&D."*

Amphico's experience highlights clear paths for more effective cooperation:

- Brands providing strategic clarity about product applications and volume expectations.
- Early pilot projects—even at small scale—to build credibility.
- Direct financial support to accelerate technology readiness.
- Transparent communication facilitating co-creation and faster commercialisation.

"Take the leap"

Claire's advice to brands is straightforward, "*Take the leap. Move from conversation to action. Integrate these materials into actual products, even if it's a small run.*"

As regulations like PFAS restrictions increasingly drive brand interest in sustainable alternatives, the potential for material innovations like Amphico's grows. However, realising this potential requires brands to evolve from observers to active participants—investing early, sharing expertise, and championing innovation within their organisations.

Image credit: Labrum

Chapter 6

Diverse and Futureproof Workforce

Diverse and Futureproof Workforce

INTRODUCTION

Individuals with highly specialist and technical skills are vital assets in the fashion and textile industry. A workforce equipped to embrace developments in innovation and technology is essential to supporting the UK's position as a global leader in quality, creativity and sustainability.

As the industry transitions to more circular business models, the skills landscape must evolve to equip current and future talent with the education, qualifications and knowledge needed to drive this transformation. This evolution requires coordination across education, industry and government to address emerging skills gaps while building on the UK's traditional manufacturing strengths.

Image credit: Nensi Dojaka

Current skills landscape and challenges

The transformation of UK fashion and textile manufacturing through technological innovation and sustainability practices requires a parallel evolution in skills and workforce capabilities. The industry faces challenges due to an ageing workforce with traditional manufacturing skills but limited exposure to newer technologies. There is also a shortage of young, skilled workers entering the industry, driven by negative perceptions of factory work that hinder recruitment efforts. Additionally, a significant skills gap exists between the current workforce's capabilities and the digital and sustainability competencies required for the future of manufacturing.

The UK fashion and textile sector faces several workforce challenges that impact its transition to circularity, with specific gaps identified across CFIN's workstreams:

Design and product development

- Limited knowledge of circular design principles and material selection.
- Insufficient understanding of design for disassembly and recyclability.
- Gaps in lifecycle assessment capabilities and impact measurement.

Manufacturing and production

- An ageing workforce in traditional manufacturing with limited exposure to newer technologies.
- Shortages in technical skills for operating advanced manufacturing equipment.
- Limited expertise in working alongside automated systems and robotics.

Circular operations

- Limited expertise in reverse logistics and circular supply chain management.
- Gaps in data analytics skills for tracking product lifecycles and impact.
- Insufficient knowledge of low-impact production methods and resource efficiency.

Management and leadership

- UKFT's Sustainability Survey revealed 30% of businesses have nobody specifically tasked with sustainability responsibilities, while only 23% have dedicated sustainability teams[32].
- Insufficient understanding of circular business models and their financial implications.
- Limited capabilities in measuring and reporting on sustainability performance.
- 50% of brands surveyed identified staff knowledge gaps as a barrier to implementing circular initiatives.
- 40% of UK brands struggle with communicating circularity effectively to consumers.
- Research with the RoLL highlighted the need for training that addresses both technical capabilities and cultural resistance to new technologies. The AI pilot with ASOS revealed initial resistance to new technologies, highlighting the need for change management alongside technical training.

TECHNOLOGY SKILLS REQUIREMENTS IN MANUFACTURING

Each area of manufacturing innovation introduces distinct skill requirements, and CFIN has identified two key areas in the context of technology skills:

- Automation and Robotics: To facilitate the shift from manual operations to automated systems, the industry requires upskilling initiatives that enable workers to programme, operate, and maintain robotic systems. Additionally, these programmes must address concerns around job displacement and demonstrate how automation can enhance rather than eliminate jobs.
- Artificial Intelligence: Effective AI implementation demands a combination of technical data literacy and change management. Workers need to understand how AI can augment their roles, improving efficiency and decision-making, rather than replace them. Training should focus on empowering employees to use AI tools to enhance their productivity and overall work performance.

Current initiatives and progress

Fostering a diverse and Futureproof workforce is one of the six pillars of UKRI's Circular Fashion Programme. Several initiatives are already underway to address identified skills gaps.

Education and curriculum development

- UKFT has worked to ensure sustainability is a core subject in the new textile and fashion T-level.
- Sustainability is now covered in the National Occupational Standards underpinning many industry vocational qualifications.
- New specialised education programmes include a BSc in Textile Innovation and Sustainability at Leeds University[33] and an MA in Fashion Manufacturing at the University of Westminster[34].

Industry training and knowledge exchange

- CFIN's Sustainability 101 guides have helped educate the UK manufacturing sector to better understand and navigate complex demands from retailers and brands.
- Continuing professional development offerings like the University of Huddersfield course on 'Sustainable Practices in the Textile and Fashion Industry'[35] provide practical training pathways.
- The Leeds University-led Back 2 Baseline Network includes skills as one of its five themes, addressing industry requirements across professional, educational and consumer categories.

Technology adoption support

- RoLL is a new fashion research facility helping micro-scale and SME fashion businesses develop high-value, low-volume garment production using agile collaborative robotic technologies.
- Post-doctoral research posts funded through the Circular Fashion Programme are dedicated to finding solutions to challenges in transitioning to circular systems.

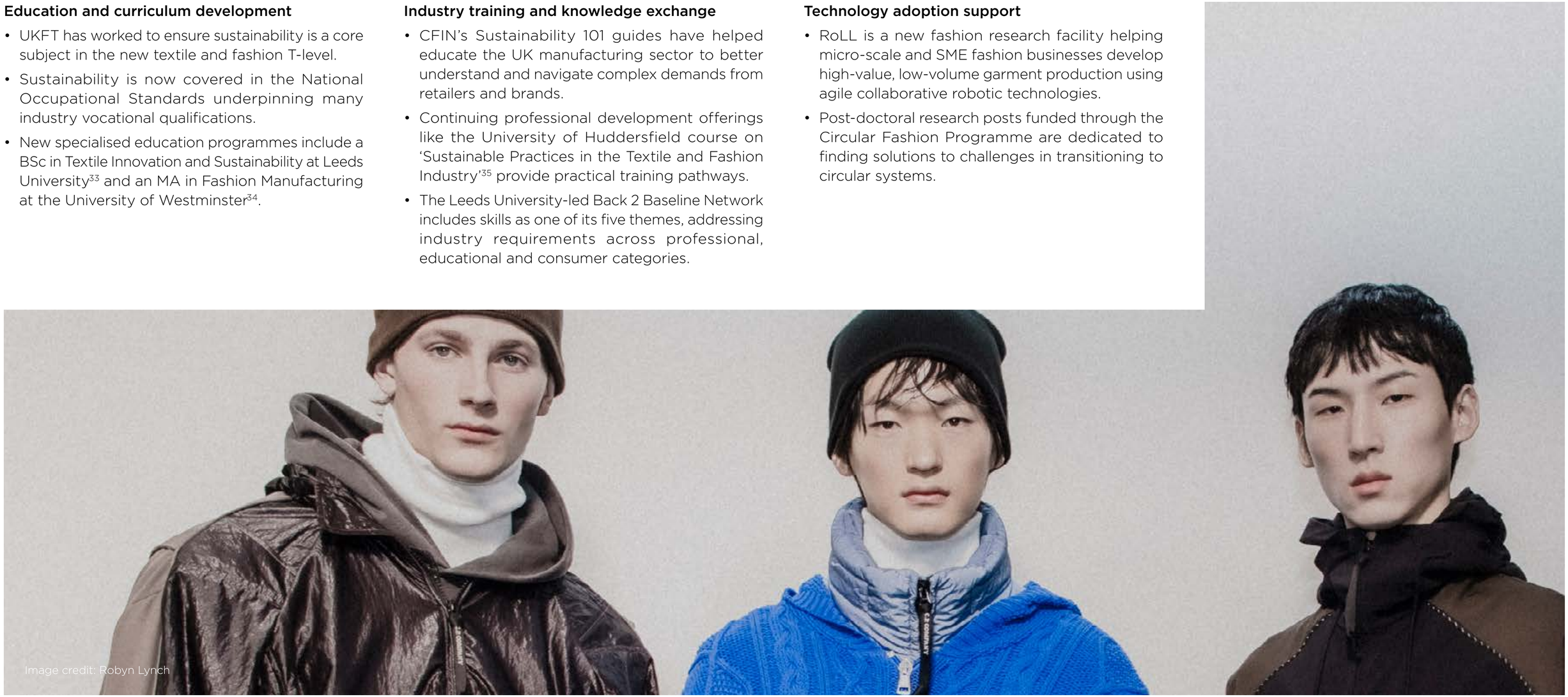


Image credit: Robyn Lynch

Recommendations

To accelerate workforce development for circular fashion, we recommend the following actions based on our research findings.

FOR INDUSTRY

- Develop a modern narrative around fashion and textile manufacturing that highlights technology integration and sustainable practices to attract new talent.
- Implement targeted upskilling programmes for existing workforce, focusing on digital literacy, sustainability principles, and technology operation.
- Establish knowledge transfer mechanisms between experienced workers and new entrants to preserve valuable traditional skills.
- Create cross-functional teams that unite sustainability, technical, and commercial expertise to drive circular innovation.

FOR EDUCATION PROVIDERS

- Collaborate with industry to develop curriculum content that addresses identified skills gaps in circularity and digital technologies.
- Integrate sustainability and circular economy principles across fashion and textile educational programmes rather than treating them as separate specialisations.
- Establish continuous knowledge exchange programmes that showcase emerging technologies and best practices.
- Design practical learning experiences that prepare students for technology-enhanced manufacturing environments.

FOR GOVERNMENT AND POLICYMAKERS

- Support development of national occupational standards and qualifications that include circular economy competencies.
- Fund targeted training programmes to address critical skills shortages in technical areas like automated sorting, chemical recycling, and digital product tracking.
- Create incentives for employers investing in workforce development for circularity.
- Coordinate regional skills initiatives that align with infrastructure development in textile recycling and sustainable manufacturing.

FOR MANUFACTURERS AND EMPLOYERS

- Invest in internal workforce training on sustainable practices and technologies.
- Frame technology adoption as skill enhancement rather than replacement, highlighting how automation and AI can augment human capabilities.
- Partner with education providers to offer work placements that expose students to modern manufacturing environments.
- Develop clear career pathways that highlight opportunities in technical and sustainability-focused roles.

Skills development strategies

To build the workforce needed for circular fashion manufacturing, our research suggests several practical approaches that complement the broader recommendations above. These manufacturing-specific strategies address both immediate skills gaps and longer-term workforce development needs:

Industry-education collaboration

Closer partnerships between manufacturers and educational institutions are essential for developing relevant curricula.

Upskilling programmes

Manufacturers can leverage training programmes to help upskill the current workforce at all levels, including management, in areas such as circularity and digitalisation.

New industry narratives

Developing a new narrative around modern industrial practices can help attract younger workers to the sector. By highlighting the technology-enhanced, sustainability-focused nature of contemporary manufacturing, the industry can challenge outdated perceptions and appeal to digitally native generations.

By investing in skills development alongside technological innovation, the UK textile and apparel manufacturing sector can build a workforce capable of driving its sustainable transformation and strengthening its global competitiveness.

Image credit: Tolu Coker

Conclusion

Building a diverse and Futureproof workforce is essential for the UK's transition to a circular fashion ecosystem. Addressing specific skills gaps will enable sustainable growth while delivering economic, environmental and social benefits. The initiatives outlined demonstrate promising foundations but require sustained commitment from all stakeholders. Workforce development must be integrated with other aspects of circular transformation rather than treated as a separate consideration. Investing in people alongside processes and technologies will give the UK fashion and textile industry the capabilities needed to lead in circular innovation, creating practical, rewarding careers that attract and retain talented individuals across the sector.

Image credit: Ahluwahlia

Chapter

7

Green Growth

Green Growth

INTRODUCTION

As the fashion and textile industry navigates substantial economic, environmental and social challenges, investment in circular innovation offers a powerful opportunity to create sustainable prosperity that aligns business performance with positive environmental outcomes.

Green Growth explores how the UK can mobilise investment for circular fashion while addressing persistent misconceptions that have limited capital flows into the sector. Our analysis draws on two complementary research initiatives:

- **Institutional Investor Perception Analysis:** CFIN commissioned *Sustainable Times* to conduct qualitative research with financial professionals across sustainable finance, asset management, and institutional investment, examining barriers to capital flows and pathways to increase investment confidence.
- **Investment Myths and Market Opportunities Research:** CFIN commissioned *Fashion Reimagined* to develop comprehensive analysis examining five persistent myths that have limited investment in circular fashion, supported by market data, case studies, and expert interviews.

Despite compelling growth projections with sustainable fashion segments expected to expand from 3.5% of the global fashion market today to 23% by 2030, representing a £700 billion opportunity, institutional investors remain cautious due to perceived risks, lack of standardised metrics, and concerns about scalability.

Institutional investor perceptions

KEY INVESTOR INSIGHTS

Our research, in partnership with Sustainable Times, reveals that while 100% of financial professionals see circular fashion as aligned with future Environmental, Social and Governence (ESG) and impact investing trends, significant barriers continue to limit capital flows into the sector.

Understanding and awareness: Financial professionals demonstrate varying levels of understanding of circular fashion, with many conflating it solely with clothing recycling or charitable donations rather than recognising the full spectrum of circular business models and innovations.

"I thought that meant recycling clothes, taking them to charity recycling bins and then them coming back again. Is that what we're talking about here?" **Hedge Fund Manager, Global Investment Bank**

Despite this knowledge gap, most respondents acknowledged the importance of fashion circularity to broader sustainability efforts:

"Circular fashion plays a very central role as the fashion industry sits at the intersection between climate (GHG emissions) and nature (biodiversity and land use)."

Investment priorities and vehicles: Investors consistently prioritise revenue generation and commercial viability above environmental impact:

"For us to support and scale the companies who will provide the materials of the future, they need to have revenue generating business models. Without business models that can generate sustainable income, they will never raise the financing needed.", **Sustainable Finance Professional, Global Bank**

Strong consensus emerged that venture capital (VC) and private equity (PE) are currently the most appropriate financial vehicles for circular fashion initiatives, particularly for early-stage innovations:

"I think venture capital or private equity, but probably especially venture capital because I think sustainable fashion is in very early stages." **Sustainable Finance Professional, Sustainable Finance Specialist, Global Bank**

Many respondents expressed caution about ESG investment in the current climate, citing reduced performance and investor appetite:

"People bought too much into this two years ago and paid too high a price. There's been lots of sort of underperformance in those types of funds and then fund flows haven't gone there because they're underperforming." **Equity Fund Manager.**

Key metrics for investment confidence: Respondents consistently identified metrics that would build investor confidence in circular fashion opportunities, with a strong emphasis on financial indicators first, followed by impact measurements:

"Financial metrics are crucial, especially around recurring revenues - can the business generate sustainable income? From the venture capital perspective though, we're often more focused on the potential for growth."

"Product reuse/recirculation rates... lifecycle impact data... jobs created or preserved." **Local Authority Consultant/Investor**

An overwhelming 90% of respondents believed that current reporting and transparency standards in circular fashion are insufficient for investment confidence:

"It's too ambiguous and not transparent. Greenwashing especially is a very big concern." **Sustainable Finance Professional, Global Bank**

BARRIERS TO INSTITUTIONAL INVESTMENT

Several persistent barriers that limit institutional investment in circular fashion were identified:

Lack of proven returns and track record: The most consistently cited barrier was the limited evidence of commercial success within circular fashion ventures:

"By a long way, the unproven returns are the barrier." **Senior Fund Manager, Pensions**

The challenge is compounded by the perception that many circular fashion businesses operate at pilot scale rather than demonstrating commercial viability at scale:

Insufficient standardisation in reporting: Nine out of ten respondents said that current reporting and transparency standards in circular fashion are insufficient for investment confidence:

"Current reporting and transparency standards in circular fashion are not yet sufficient to build full investor confidence. There is a lack of standardised, verifiable metrics to measure impact, scalability, and financial performance across the value chain."

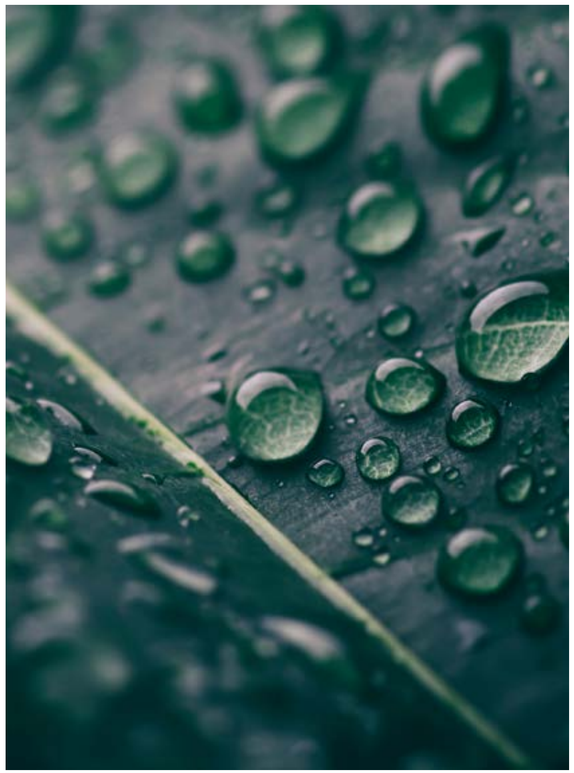
Limited visibility and categorisation: Several interviewees noted that institutional investors often lack a clear understanding of the circular fashion landscape:

"People just don't even know what this is... it is just so outside of cultural norms... Decision-making body in the hedge fund world is overwhelmingly male... recycling clothes isn't really a thing [to them]."

"Lack of visibility of the opportunities... and how not being sustainable has a negative impact on investor returns." **Governance Committee Member, Leading Pension Fund**

Regulatory uncertainty: Regulatory uncertainty emerged as a significant barrier to institutional investment in circular fashion:

"Regulatory absence or ambiguity around end of waste definitions, recycled content rules and historic absence of regulatory drivers (carrots or sticks) underpinning markets." **Local Authority Consultant/ Investor**



Institutional investor perceptions

PROMISING INVESTMENT AREAS

The research identified several specific aspects of the circular fashion ecosystem as particularly promising for investment:

"The most promising areas for investment within circular fashion include resale platforms, textile recycling technologies, and circular supply chain innovations." **CEO, Sustainable Investment Group**

"Nature-based materials such as cotton... needs investing to shift to regenerative farming practices. New bio-based and biodegradable materials." Sustainable Finance Professional

Several respondents noted that investment success would require leadership from established fashion companies:

"It's quite a cottage type industry. The big companies to be focused on this. Next, Primark, and Marks and Spencer; these big companies must become the flywheel of circularity cost reduction." **UK Equity Fund Manager**

PATHWAYS TO INCREASE INVESTMENT

Research identified several strategies to increase capital flows into circular fashion:

Policy and market incentives: Respondents consistently called for policy and market interventions to help de-risk investment and catalyse capital:

"Maybe EIS for tax relief? Maybe some green version of it?" **Hedge Fund Manager, Global Investment Firm**

"Tax incentives for utilising certified recycled products... procurement policies in the public sector." **Partner, Leading Pensions Firm**

Standardised metrics and reporting: Developing clear, consistent metrics was regularly identified as crucial for building investor confidence:

"Standardised reporting frameworks would enable more accurate benchmarking across investments."

"For institutional and sophisticated investors to commit capital, we need more consistent ESG reporting frameworks, greater supply chain traceability, and independent third-party validation."

Learning from other sectors: While half of respondents couldn't identify strong parallels from other industries, those who did pointed to renewable energy, packaging, and mining as sectors offering valuable insights:

"We need to see self-sustaining and revenue-generating businesses... Renewable energy generates money, it receives policy support."

"Packaging, plastics and glass have shown real progress in reduced waste to landfill."

Investment myths and market opportunities

Our research with Fashion Reimagined identified and systematically challenged five persistent myths that have limited investment in circular fashion innovation. Each myth was examined alongside market evidence and relevant case studies that demonstrate the sector's commercial viability and growth trajectory.

MYTH 1

"Circular fashion is just a niche market"

THE MYTH

Many investors continue to view circular fashion as a fringe movement rather than recognising it as a fundamental industry shift, questioning market size and exit opportunities.

THE REALITY

The global apparel and textile industry is valued at nearly £2 trillion[36], with Europe contributing 25-30% of sales. Consumer behaviour is shifting fundamentally, with circular fashion segments growing three to four times faster than the conventional apparel market[37].

- Second-hand apparel reached £100-120 billion in 2022[38], projected to grow to £367 billion by 2028-2029 (10% CAGR)[39].
- Rental fashion: Valued at £6.3 billion in 2023, expected to reach £7-8 billion by 2026 (11% CAGR)[40].
- Repair & alteration: Valued at £1.5 billion in 2023, projected to reach £2.6 billion by 2032 (11% CAGR)[41].
- Textile recycling: Valued $4.6–7.1 billion in 2022–2023, projected to reach $7–11 billion by 2030 (3-7% CAGR)[42].
- Innovative materials: Worth $18-26 billion in 2022-2023[43], projected to reach $28-92 billion by 2029-2032 (8-13% CAGR)[44].

"There's a lack of acknowledgment of how important fashion is. This thinking that fashion is not a scalable or large market opportunity is kind of crazy because textiles drive economies and are foundational to the wealth of nations." **Edward Brial, Founder and CEO, Materra**

CASE STUDY: DEPOP

Depop, a London-based second-hand fashion marketplace founded in 2011, grew to 30 million users across 150 countries, with particular strength among Gen Z consumers. Ten years later, the company was acquired by Etsy for £1.63 billion[45].

Relevance? Depop provided a landmark exit that validated the enormous financial value in circular fashion. This unicorn exit delivered substantial returns to early investors, including prominent UK VCs Balderton Capital and Octopus Ventures, challenging the perception that circular fashion is merely a niche market.

LEARNING FROM CLEAN BEAUTY AND FOOD

The clean beauty and organic food sectors demonstrate how consumer preferences can fundamentally shift toward sustainability. Notable exits through acquisitions by incumbents include: The Ordinary ($1.7 billion by Estée Lauder[46]), Paula's Choice ($2 billion by Unilever[47]), Drunk Elephant ($845 million by Shiseido[48]), and Whole Foods ($13.7 billion by Amazon[49]). These sectors provide a roadmap for how circular fashion can scale from niche to mainstream, representing a projected £700 billion opportunity by 2030.

"The fashion industry is benchmarking the beauty industry and how it is evolving" **Yoobin Jung, Investor at Plug and Play**

MYTH 2

“Fashion is about design, not technology”

THE MYTH

The fashion industry is rarely framed as a technology sector, despite being fundamentally materials and chemicals based, leading to technological innovations being undervalued by traditional tech investors.

THE REALITY

Fashion is fundamentally a materials industry: 67% of textiles are made from synthetic fibres derived from fossil fuels, 20% grown from cotton[50], and 90% of dyes are petroleum-based[51]. Research indicates that 80% of a product’s environmental footprint is established during the initial design phase, where materials and colours play a key part[52].

Over 650 innovations exist in the material innovation space (up from 130 in 2017)[53], with next-generation (*“next-gen”*) materials raising over £3 billion since 2014. In 2023 alone, startups developing next-gen materials raised over $500 million from 88 unique investors[54].

“I definitely think that fashion is almost certainly not about design. I do think a lot of it is actually about technology and I think we’re seeing more and more of the general consumer understanding about it […] The importance of technology within the fabrics world is much easier to communicate to the end consumer… you can actually tell them, if I have a fabric which has better performance… it’s going to last you longer or it’s going to look nice for many years.” **Eva Tarasova, Investment Director, Wharton Asset Management**

CASE STUDY: COLORIFIX

Colorifix, founded by scientists from Cambridge University, has developed a revolutionary bio-based dyeing technology using engineered microorganisms to produce and transfer pigments onto textiles. The company has secured approximately £41 million in investment, including from H&M Group Ventures. Its process cuts out hazardous chemicals and can reduce water use by up to 77% compared to conventional dyeing.

Relevance? Colorifix directly challenges the myth by addressing wet processing, responsible for 50% of the industry’s emissions and extreme water consumption, with dyeing being the largest component of that. What sets it apart is a focus on supply chain integration and achieving strong unit economics from the beginning, making its solution more economically viable than many biotech competitors and attracting significant VC funding.

“There is a massive opportunity to move forward a highly environmentally damaging industry but look for evidence of genuine scaling potential when making your assessment.” **Chris Hunter, Colorifix COO**

CASE STUDY: PACT

Founded by Yudi Ding and based in Cambridge’s Science Park, PACT has raised approximately £10 million seed funding and recently closed a very successful [undisclosed] Series A round. PACT develops novel protein-based materials for applications similar to coated textiles, canvas treatments, and fabric finishes. It doesn’t position itself as a direct leather replacement. PACT began with supply chain integration as their foundation and has cultivated deep relationships with luxury brands and manufacturers, focusing on long-term development rather than small capsule collections.

Relevance? PACT directly challenges the myth by showing that fashion innovation is fundamentally about materials science, as well as design. By integrating with supply chains from day one and focusing on high-performance materials that meet industry standards, PACT demonstrates that technical substance trumps sustainability marketing. Its success in attracting significant investment proves that investors value deep technological expertise and commercial traction when it is paired with practical manufacturing knowledge and realistic commercialisation pathways.

“Most VC investors lack fashion knowledge. They can’t tell what’s good enough for the brand… They see some materials, and they get excited. But that’s far from being a commercialisable product.” **Yudi Ding, PACT’s founder**

MYTH 3

“Sustainable materials can’t scale and circular models are too complex”

THE MYTH

Critics argue that eco-friendly materials will always be more expensive and niche, while circular business models are too logistically complex to be profitable.

THE REALITY

Market data shows sustainable raw materials in fashion collections jumped from 15.8% in 2020 to 57% in 2023[55]. Major brands including H&M, Zara, and Uniqlo have set targets to use nearly 100% sustainable or recycled materials within this decade[56].

Circular business models are gaining significant commercial traction:

- 163 brands now operate their own resale programmes, up 31% from 2022[57].
- Nearly two-thirds of retail executives offering resale expect it to generate more than 10% of revenue within five years[57].
- 87% of these executives say resale has advanced their sustainability goals[57].

“Real impact comes with scale! We are at the beginning of this journey, that’s how I feel” **Mary McCarthy, Partner, Sofinnova Partners**

CASE STUDY: EPOCH BIODESIGN

Who? Epoch Biodesign, a UK-based circular economy innovator founded by Jacob Nathan, designs enzymes that transform plastic waste into valuable chemicals, offering an industrial-scale solution for textile-to-textile recycling. The company has been focusing on economic viability first, integration with textile supply chains, and leveraging strategic brand partnerships. Epoch has attracted significant investment from Inditex and leading climatech VCs, raising over $34 million to-date. The company is building a 150-tonne/year demonstration plant in the UK with plans for a commercial facility targeting tens of thousands of tons by 2028.

Relevance? Epoch directly challenges the myth that circular models are too complex to scale by developing technology with compelling economics that doesn’t rely solely on sustainability regulations. Its approach proves that circular business models can succeed through strong economic fundamentals rather than just environmental benefits. By focusing on selling to supply chains rather than brands directly, Epoch demonstrates how circular technologies can integrate with existing industry infrastructure and attract major investment even in challenging market conditions.

“Our business model does not rely solely on heavy legislation being in place [...] For investors that dug far enough to understand this fundamental step change in unit economics of how things can be made, that was really exciting for them, because this is a business that survives irrespective of who is in the White House.” **Jacob Nathan, Epoch’s Founder**

CASE STUDY: INDITEX

Who? Inditex, one of the world’s largest fashion retailers and parent company of brands like Zara and Massimo Dutti, has created a comprehensive platform to discover, develop, and scale better materials and processes through its dedicated Sustainability Innovation Hub. Their approach combines offtake commitments for innovative recycled fibres with direct investments in promising material technology startups including: CIRC (industrial-scale recycling for poly-cotton blends), Infinited Fiber (cellulose fibre recycling), Galy (lab-grown cotton using plant stem cells), and Epoch Biodesign (AI-powered enzyme development). In 2024, 73% of textile fibres used in Inditex products were lower impact, with recycled fibres reaching 39%. Their commitment is that by 2030, 100% of their textile products will only use materials with lower environmental impact.

Relevance? Inditex directly challenges the myth that sustainable materials can’t scale by demonstrating how one of fashion’s largest players can systematically transform its material sourcing. Its strategy proves that sustainable materials can serve mass-market demand when backed by strategic innovation processes, financial commitments through offtake agreements, and direct investments in technology startups. By establishing measurable targets and showing consistent progress, Inditex creates the market certainty needed for new technologies to develop and scale across global supply chains.

MYTH 4

“There are no clear exit pathways for circular fashion innovators”

THE MYTH

Critics argue established fashion companies have little interest in acquiring sustainable startups and exit pathways for innovators are not established yet.

THE REALITY

The exit landscape is far more diverse than commonly perceived, with multiple successful exits demonstrating viable pathways across different channels:

“We don’t see a lack of exit opportunities. What we see is a longer ‘valley of death’ that the startups have to get across to be able to scale to a certain point, to be able to be considered as being a technology that is acquirable.” **Mary McCarthy, Partner, Sofinnova Partners**

Mergers and Acquisitions (M&A)

- Depop’s £1.6 billion acquisition by Etsy (2021)[58]
- Poshmark’s $1.2 billion acquisition by Naver (2022)[59]
- Textile Genesis’s trade sale to Lectra[60]
- Global Blue Group acquisition of Zig Zag[61]
- Quantis trade sale to Boston Consulting Group[62]

Initial Public Offerings (IPO)

- The RealReal[63], ThredUp[64], Vestiaire Collective[65], and Rent the Runway[66] all achieved successful IPOs with unicorn valuations.
- Allbirds reached $4 billion valuation in 2021[67].
- Spinnova, a Finnish sustainable fibre technology company, and HeiQ AeoniQ, a Swiss company commercialising biobased polymers, went public on the stock exchange[68] [69]

Chemical and Industrial Partnerships

- Sulzer Chemtech invested in UK-startup Worn Again[70]
- Evonik invested in Modern Meadow[71]
- Fortum invested in Infinited Fiber Company[72]
- Marubeni invested in Circ[73]

Private Equity (PE) Investments

- Carlyle Group acquired 40% stake in Jeanologia[74] and a minority stake in Spiber[75]
- TPG led a secondary investment in Vinted at a valuation of €5 billion[76]

CASE STUDY: JEANOLOGIA

Who? Jeanologia, a producer of innovative textile finishing solutions focused on reducing water, energy, and chemical usage in denim production, saw the Carlyle Europe fund acquire a 40% minority stake for £135 million in 2017. The company has since validated that over 35% of global denim production is made with their technology[77].

Relevance? Jeanologia directly challenges the myth about limited exit pathways by demonstrating that sustainable technology companies in fashion can attract major private equity investors and command substantial valuations.

“Today’s consumer is focused on the environmental footprint of fashion choices, and demands brands and retailers produce clothes that reflect this concern – this approach has always been part of Jeanologia’s mission.” **Carlos Robles, Director on the Carlyle Europe Partners team and part of the CEP team**[78]

MYTH 5

“Traditional VCs always spot the next big thing”

THE MYTH

If circular fashion were truly promising, mainstream VCs would already be heavily invested.

THE REALITY

While mainstream venture capital has been slow to recognise the potential, a diverse ecosystem of forward-thinking investors is emerging, including:

- Strategic Brand Investors: H&M Group Ventures, Adidas Ventures, Inditex, Kering Ventures, LVMH, Patagonia, Asics Ventures, Decathlon Pulse, Hermes Ventures, Chanel Ventures
- Supply Chain Partners: PDS Ventures, MAS Holding, Lenzing, Indorama, Volta Circle, Marubeni, Sulzer Chemtech
- Specialised Textile Funds: Fashion for Good, Alante Capital, Bombyx Capital, Collateral Good Fashion Fund
- Family Offices & Impact Investors: Novel Fashion Holding, The Conduit, Laudes, Canopy
- Specialised Sector-Focused VCs: Regeneration VC, Safer Made, Astanor Ventures, Sofinnova Partners, Main Sequence, Extantia, At One Ventures, Prelude Ventures
- Traditional Tech VCs: Plug and Play, SOSV, TechStars
- Private Equity: Carlyle Group, TPG, Permira

Several factors contribute to traditional VCs missing the opportunity, including misapplication of software investment timelines to circular fashion innovation, lack of specialised expertise, overemphasis on asset-light business models and wider gender issues in the VC ecosystem.

“The problem number one tends to be: it is not software... you’re often dealing with material science and or hardware or things that are going into supply chains.” **Jamie Rowles, Partner, Regeneration.VC**

“I think lots of VCs - the people in them - have historically come from finance or engineering or tech - and they have also quite often been male. So first, those functions aren’t often close to fashion and textiles. And on the second, there’s a gender issue.” **Climatech Investor**

“Fashion is seen as, to be honest, not a big impact category by climatech investors relative to energy or transport.” **Jamie Rowles, Partner, Regeneration VC**

CASE STUDY: MATERRA

Materra - a London-based technology company founded by Edward Brial and two co-founders - provides a one-stop nature-based solution for the fashion industry to source fully traceable, regenerative cotton at scale. Rather than pursuing traditional VCs, Materra successfully targeted and secured funding from strategic investors, raising approximately £3.8 million from strategic investors such as H&M Group Ventures, Bestseller, and PDS Ventures. The company has successfully moved from concept to commercial implementation in record time, with regenerative cotton products now available in Mango and Ecoalf stores and hydroponic products available in COS (H&M) shops.

Relevance? Materra directly challenges the myth that traditional VCs always spot promising opportunities by showing how strategic fashion brand investors can better recognise and support industry innovation. By progressing from concept to commercial stores in just three years, Materra demonstrates that sustainable materials can scale rapidly with the right partners. Its approach shows that early-stage traction in fashion B2B shouldn’t be measured by revenue alone, but by contractual commitments from brands and scaling potential.

“On our seed round, we had to get investors that were the strategic arms of fashion brands. Once we had a fashion brand leading the round, then it was easy for us to get follow-on funds.” **Edward Brial, Co-founder and CEO Materra**

CASE STUDY: H&M GROUP VENTURES

H&M Group Ventures is the corporate venture capital arm of H&M Group, one of the world’s largest fashion retailers. With 17 investments to date in companies tackling key industry challenges, H&M takes a strategic approach to investment that differs from traditional VCs. Rather than being primarily exit-driven, it focuses on enabling long-term scale for technologies that can transform the fashion industry. It de-risks through demand with commercial validation through LOIs or formal offtake agreements, build collaborative investment syndicates with other strategic fashion brands to create broader offtake potential, and employ diverse engagement models including joint ventures and strategic acquisitions to accelerate impact.

Relevance? H&M Group Ventures demonstrates how strategic investors fill the gap left by traditional VCs who have been slow to recognising circular fashion’s potential. Its approach addresses key barriers that have prevented capital from flowing into sustainable fashion: it provides crucial market validation through commercial commitments, coordinate with other fashion brands as co-investors to create powerful market signals that reduce perceived risk, and evaluate startups’ ability to integrate with complex fashion supply chains—a critical assessment that generalist investors struggle to perform.

“The most recent barrier is brand demand... Investors want to de-risk as much as possible and want to see demand from major players.” **Laura Coppen, H&M Group Ventures**

Recommendations

To accelerate capital flows into circular fashion, our research suggests several key actions.

FOR POLICYMAKERS AND GOVERNMENT

- Develop targeted grant programmes and tax incentives for circular fashion innovation.
- Implement EPR schemes.
- Establish clear standards for circular fashion claims.
- Create public procurement policies prioritising circular textiles and apparel.
- Invest in enabling infrastructure for textile collection, sorting, and recycling.

FOR FINANCIAL INSTITUTIONS

- Develop specialised investment thesis and vehicles for circular fashion businesses.
- Create blended finance partnerships leveraging public, philanthropic, and private capital.
- Build expertise in textile supply chains, materials science and sustainability metrics.
- Establish standardised due diligence frameworks for evaluating circular fashion investments.

FOR BRANDS AND INDUSTRY

- Move beyond pilot projects to commercial-scale implementation of circular models.
- Form strategic partnerships with investors and innovators.
- Commit to multi-year purchase orders and offtake agreements with supply chain partners.
- Create industry-wide standards for circular fashion terms and practices.
- Develop consistent metrics for measuring circularity performance.

FOR INNOVATORS AND STARTUPS

- Develop deep relationships with brands and their strategic supply chain partners.
- Prioritise supply chain integration from inception.
- Focus on demonstrating clear revenue models and unit economics (at scale) alongside environmental benefits.

CREATING A UK LEADERSHIP POSITION

The UK has a unique opportunity to establish itself as a global centre for circular fashion investment:

- **Innovation finance initiative:** Establish a dedicated sustainable fashion investment fund addressing the critical funding gap between laboratory success and commercial scale.
- **Industry-investor connection platform:** Create a structured programme connecting innovators with specialised investors.
- **Standardised metrics programme:** Develop a UK framework for measuring and reporting circular fashion performance.
- **Cross-sector knowledge transfer:** Facilitate learning exchanges with successful adjacent sectors, like renewable energy and clean beauty, applying proven models for scaling sustainability innovations.
- **Regulatory coordination initiative:** Align UK regulations with emerging international standards.

By implementing these recommendations, the UK can accelerate capital flows into circular fashion innovation, creating both economic value and environmental benefits while positioning the country as a leader in the growing global market for sustainable fashion solutions.

Image credit: Roksanda

Chapter 8

Policy Recommendations

Policy Recommendations

POLICY DEVELOPMENT PROCESS

Over the past two years, CFIN has engaged with industry leaders, government representatives and sustainability experts to develop targeted policy recommendations for advancing circularity in the UK fashion and textile sector.

In 2024, CFIN established a Policy Working Group to identify priority areas for policy recommendations for government. The group identified several priority areas and evaluated each against comprehensive criteria for implementation feasibility and potential impact.

- The group scored each area from one to four across implementation and impact criteria.

Implementation criteria included:

- How quickly the policy could be implemented
- Financial implications for businesses and government
- Specialist/additional support needs
- Alignment with current EU policy

Impact criteria included:

- Clarity of guidance for businesses/consumers
- Strength of long-term business case
- Path towards carbon emissions reduction
- Alignment with UK Government's Just Transition Goals
- Magnitude/scale of change facilitated

Following a comprehensive scoring system, one policy emerged as the highest priority: EPR for fashion and textiles in the UK.

Image credit: JWA

EPR for textiles

CFIN recommends introducing mandatory, variable EPR for textiles in the UK. Our research indicates that EPR represents the most effective policy mechanism to drive systemic change in how textile products are designed, produced, used and managed at end-of-life.

The case for EPR

The UK fashion and textile industry contributed £62 billion to the economy in 2023, but also generates significant environmental impacts. Currently, millions of garments end up in landfill annually, while recycling infrastructure remains underdeveloped.

EPR places financial responsibility on producers for the entire lifecycle of their products, creating economic incentives for sustainable design and circular business models. By implementing a well-designed EPR scheme, the UK can reduce textile waste, drive innovation in sustainable design, create demand for recycled materials, generate funding for collection systems and support net-zero goals.

Key principles

CFIN recommends building the UK's textiles EPR scheme on three core policy principles:

1. **Variable 'eco-modulated' fees:** Variable fees are essential for incentivising eco-design and sustainable business models. The fee structure should reward sustainable practices and penalise environmentally harmful ones.
2. **Mandatory participation:** EPR must apply to all textile producers, including SMEs, to create a level playing field and prevent loopholes.
3. **Ring-fenced funding:** Income generated from EPR fees must be dedicated to investing in the continued research, innovation and scaling of the circular fashion and textiles.

Image credit: Emilia Wickstead

Recommended implementation pathway

Based on consultation with industry bodies including the British Retail Consortium, WEFT and WRAP, CFIN proposes a phased pathway to bring forward secondary legislation within this Parliament under the Environment Act 2021[79] to introduce EPR for textiles in the UK.

Phase 1: Explore

- Government consultation with stakeholders across devolved nations and industry to inform Green Paper.
- Government and industry collaborate to identify and establish Producer Responsibility Organisations (PROs) and define its scope and responsibilities.
- Government works with industry to scale up further intelligence gathering to inform the design of an effective UK EPR system.

Phase 2: Test

- Test the scheme with voluntary eco-modulated fees and incentives with industry participants.
- Pilot data reporting standards, supporting international data harmonisation and information transparency.

Phase 3: Commit

- Progress to White Paper and pass secondary legislation for mandatory, variable EPR for textiles in the UK.
- Consult and work closely with devolved nations to ensure legislation and operational support for a joined-up UK-wide EPR scheme.
- Provide industry with certainty and confidence by setting out a clear timeline for implementation with appropriate notice.

Phase 4: Implement

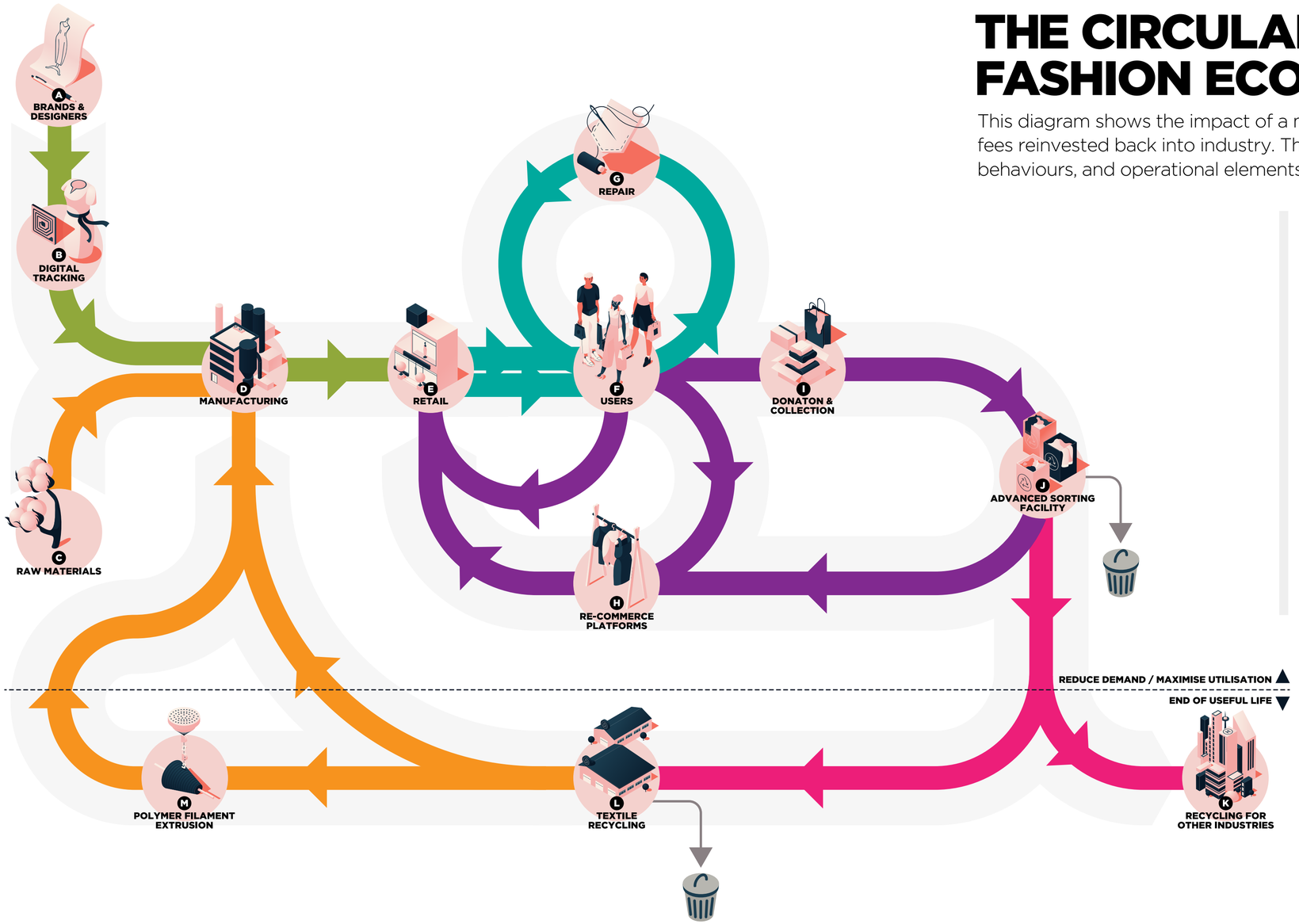
- Begin phased rollout of mandatory requirements across the UK.
- Set up PROs nationally with inclusive governance.
- Monitor and evaluate and regularly update fees to optimise incentives for eco-design and waste reduction across the supply chains.

International context

Several countries have already implemented or announced EPR schemes for textiles, including France, Sweden and the Netherlands. The EU is also developing harmonised EPR requirements and related policy, including digital product passports and minimum recycled content standards. By implementing a well-designed scheme, the UK can maintain competitiveness while setting new standards for sustainability.

THE CIRCULAR FASHION ECOSYSTEM

This diagram shows the impact of a mandatory variable EPR system with fees reinvested back into industry. This maps the future flows, consumer behaviours, and operational elements needed to achieve circularity.



MATERIAL FLOWS

- Raw materials
- Producing new garment
- Reused garment/product circularity
- Maintain garment
- Reused material/raw materials circularity

FLOW IMPACT

- Impact fully realised
- Impact limited
- Impact restricted
- landfill/incineration

To build a Circular Fashion Ecosystem, it is essential to implement robust and targeted EPR legislation in support of the CFE target state diagram[80]. Systemic change within the industry depends on EPR policies that incorporate variable fees, mandatory participation, and ring-fenced funding—ensuring that monies generated is reinvested directly back into circular infrastructure and innovation.

With these mechanisms in place, the right incentives are created to unlock material flows across the entire sector. This enables the scaling of circular business models, promotes the repeated use of materials, and leads to a substantial reduction in waste—potentially eliminating it altogether in some areas.

Next steps

CFIN recommends continued collaboration between industry and government bodies, including Department for Environment Food and Rural Affairs, Department for Business and Trade and Department for Digital, Culture, Media & Sport, to finalise the research, test models, and ensure both policy schemes are effective and inclusive. For EPR specifically, next steps include research to refine fee structures, agreeing and standardising data reporting, and committing to a legislative timeline.

The UK government has an immediate opportunity to commit to implementing EPR for textiles. With industry-driven research, the right legislative framework, and a collaborative approach, these policy recommendations can set a clear path for a transition towards a circular economy, support net-zero goals, and create opportunities for sustainable growth in the fashion and textile industry.

Image credit: Regina Pyo

Image credit: Orlebar Brown

Chapter 9

Conclusion and Key Next Steps

Conclusion and Key Next Steps

CFIN has successfully mobilised key players across the UK fashion and textile sector, engaging stakeholders from raw material suppliers to end-of-life processors. This collective effort has delivered tangible results: practical implementation guides for circular business models, evidence-based research on reshoring opportunities, a comprehensive National Textile Recycling Infrastructure Plan, and pathways to unlock investment for innovation.

Our work has moved the sector beyond dialogue to practical action, creating the tools and frameworks needed for a circular transition. The detailed research, industry pilots and strategic roadmaps in this report provide a solid foundation for the next phase of transformation, though challenges remain in scaling these solutions across the industry.

Image credit: Qasimi

THE CRITICAL NEED FOR CONTINUED MOMENTUM

The past two years have demonstrated the power of industry-led collaboration. By bringing together brands, manufacturers, recyclers, investors, academia and policymakers in a coordinated effort, CFIN has fostered a shared vision and practical roadmaps for circular transformation that would not have emerged through individual company initiatives.

However, the transition to circularity is a long-term journey that requires sustained effort and resources. Without continued support for collaborative initiatives like CFIN, the UK fashion and texrile sector risks losing the momentum built, with promising pilot projects failing to scale and innovative solutions remaining confined to niche applications rather than transforming mainstream industry practice.

As international competitors develop coordinated national strategies for textile circularity, continued government support for industry-led initiatives becomes increasingly critical. The unique convening function that CFIN provides cannot be replicated by individual companies or existing industry bodies and is essential for maintaining the coordinated approach needed for system-wide change.

Key Next Steps

From the work CFIN has done, the following areas have been identified as priority next steps for industry.

CBMs

- **CBM Accelerator:** Take cohorts of 8-10 mid-sized brands and retailers through a 6–8 week programme where each select one CBM with CEO-backing, and receive expert support to design, implement, and scale their chosen circular business model.
- **Circular Design:** Develop an industry-standard circular design course that organisations can implement for employee training and that educational institutions can incorporate into existing curricula.
- **Business Transformation:** Create a sophisticated maturity assessment tool to help organisations evaluate their circularity journey, benchmark their current position, and chart a clear path toward enhanced maturity.

Sustainable Manufacturing

- **Automation and Robotics:** Test the solutions discussed in this report to evaluate their practical application and effectiveness in manufacturing environments.
- **AI:** Continue exploring AI applications in manufacturing settings to enhance the efficiency, quality, and sustainability of domestic fashion production.
- **Apparel Manufacturing Park:** Conduct comprehensive industry demand assessments to determine the need, viability, and capacity requirements for an apparel manufacturing park in the UK.

Recycling Infrastructure

- **National Textile Recycling Infrastructure Plan:** Model costs associated with the proposed infrastructure, conduct environmental impact analyses, and define a strategic 5-10 year roadmap for implementation.
- **Supply Chain Integration & Traceability:** Undertake a pilot programme to trace post-consumer textiles, gathering critical data needed to understand the scale, flows, and complexities of the post-consumer waste journey.

Novel Technology

- **Novel Technology Showcase:** Continue the showcase initiative, connecting innovative start-ups, established corporations, and investors to accelerate partnerships that advance circular fashion solutions.

Diverse & Futureproof Workforce

- **Textile Recycling Infrastructure Skills:** Determine specific textile-to-textile recycling skills and training requirements and integrate these into existing vocational qualifications and university programmes.

Green Growth

- **Investment and growth:** Assess current and potential circular fashion investment opportunities to secure funding for the priority initiatives outlined by the CFIN programme.

Policy

- **EPR:** Work with government to advance legislation on the target-state EPR system. Continue collaborative efforts to model this system with real industry data to determine optimal operational parametres.

Seizing the opportunity

The circular transition presents a significant opportunity to build a more resilient, innovative and sustainable UK fashion sector. The industry now stands at a crucial juncture where the foundations for change have been established but require continued commitment to deliver tangible outcomes.

To capitalise on the work accomplished through CFIN, we urge the following stakeholders to take the following actions.

For government and policymakers: Sustained investment in industry-led initiatives is essential to maintain momentum and coordinate action across the sector. Implementing the proposed EPR framework would create the necessary financial mechanisms to support infrastructure development while incentivising sustainable design and business practices.

For brands and retailers: Convert pilot initiatives into core business operations by integrating circular principles into corporate strategy, product development processes, and supply chain management. Make clear commitments to increasing the proportion of products designed for circularity year-on-year.

For manufacturers: Embrace the reshoring opportunities identified through our research, investing in the technologies and skills needed to create a competitive UK production sector built on principles of resource efficiency and circularity.

For investors and financial institutions: Recognise the commercial potential of circular innovations by developing investment vehicles that account for their unique characteristics and timelines. The transition requires patient capital aligned with the realities of physical product cycles rather than digital-sector growth expectations.

For skills providers: Develop programmes that address the specific capability gaps identified in our research, ensuring the UK workforce is equipped with both the technical and commercial skills needed for circular operations.

Realising the benefits of circular fashion requires immediate, coordinated action across these stakeholder groups. The commercial, environmental and social value is clear, but can only be unlocked through continued collaboration and investment.

The case for continued CFIN funding is compelling. No individual organisation can coordinate the system-wide changes needed for circular transformation. It is critical that the government continues to fund CFIN and similar programmes to maintain the industry alignment and collaborative momentum created. Without this targeted investment, the progress achieved will stall, and the UK will miss a significant opportunity to build competitive advantage.

With the right support, the UK can build a fashion sector that combines economic resilience with positive environmental impact – creating quality employment, driving technological innovation, and establishing a strong foundation for the next generation of fashion businesses.

Image credit: Raeburn

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Wendy Carter, Founder, kitround

Anoli Mehta, Founder, Circular Threads

CFIN Activities and Resources

Reports

1. CFIN Interim Report
2. Measuring the State of Circularity in the UK Fashion Industry
3. Scaling Circular Business Models Playbook
4. Shaping the Future of Sustainable Fashion Communication: Overcoming Barriers, Driving Engagement, and Ensuring Compliance
5. Circular Manufacturing Report
6. Advancing Automation and Robotics for Sustainable Manufacturing - Strategic Pathways for the UK Textile Industry
7. Innovations in Apparel and Textile Dyeing (Technology and Colour)
8. Responsible UK Fashion and Textile Supply Chains: Building a Sustainable Future
9. Reshoring for Real: The future of UK Domestic Manufacturing

Programme Campaigns

1. CFIN: One Year On Film
2. Workshop: Exploring Automation and Robotics for UK Fashion and Textile Manufacturing
3. Workshop: Ecodesign
4. Workshop: Shaping the Future of Sustainable Fashion Communication with Clarasys and APE Studios
5. Novel Tech Showcase

Events

1. Materialist Pilot Showroom Launch
2. CFIN: One Year On

Webinars

1. CFIN: Putting Humans at the Heart of Circularity with Accenture
2. Driving Textile Recycling Through Policy in the UK
3. From Concept to Concession: How to Implement Successful Repair Services in Fashion
4. 'Innovation & Unlocking Value in Fashion Resale' webinar with eBay, Reskinned and Certilogo
5. Navigating Green Claims & Avoiding Greenwashing: Guidance from the Competition & Markets Authority
6. Advancing Automation and Robotics for Sustainable Manufacturing
7. How Novel Tech is Enabling Circular Fashion

Sustainability 101 Series: Webinars

1. Taking responsibility through standardisation: Deep dive into Oeko tex certification
2. Unlocking the business value of certification with Textile Exchange's tools
3. The Sustainable Fashion Communication Playbook Masterclass: Shifting the Narrative around Green Claims
4. How to avoid Greenwashing in Fashion, with the Competition and Markets Authority
5. Understanding Responsible Supply Chains in Fashion & Textiles
6. Introduction to Human Rights Due Diligence
7. Understanding Environmental Due Diligence and Tools for Compliance
8. EU Sustainability Legislations: What impact could it have on your business?
9. Complying with the UK and EU REACH Regulations, with Valpak
10. High-risk restricted chemical substances in the apparel and footwear sector

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1. Issue One: A UK Manufacturers' Guide to Standards and Certification
2. Issue Two: A UK Manufacturers' Guide to Green Claims
3. Issue Three: A guide to human rights and environmental due diligence in supply chains
4. Issue Four: A guide to Chemical Compliance

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