



# SUSTAINABILITY & CLIMATE RISKS

## THOUGHT LEADERSHIP BRIEF SERIES

### Why are Garment Disposals Still Found in Landfills?

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Photography by Tom Fisk on Pexels

#### KEY POINTS



- ▶ Many consumers prioritize trendy, low-priced fast fashion, continue unsustainable habits and accumulate garment wastes despite growing environmental awareness.
- ▶ Apparel companies face challenges transitioning to circular models due to financial concerns and the need for revolutionized operational workflows.
- ▶ Recycling difficulties arise from blended fabrics and outdated technologies, but artificial intelligence (AI) innovations may enhance recycling efficiency.
- ▶ Strong government regulations and incentives are essential to manage textile waste and foster data traceability and sustainable practices within the fashion industry.

#### ISSUE

Every year, millions of garments are discarded. The US Environmental Protection Agency reported in 2024 that the US produced an estimated 17 million tons of textile wastes in 2018, while the European Parliament reported in 2024 that the EU generates nearly 13 million tons annually. Unwanted fashion items may hold value for others, emphasizing the need for circularity. Despite efforts to foster circularity through initiatives like recycling collection boxes and second-hand platforms, many garments are still discarded in landfills. This brief will explore the underlying reasons for this phenomenon.



## ASSESSMENT

Addressing the challenges of circular fashion requires examining two significant forces: the demand side and the supply side.

### Consumers' Concerns and Actions

Incorporating circular economy principles in the fashion market requires a shift in consumer habits. Despite increasing awareness of the environmental impacts, many consumers continue to buy trendy fashion frequently. The appeal of low-priced fast fashion reduces consumers' incentive to purchase second-hand or recycled goods. Skepticism about the ethical claims of fast fashion brands also fosters concerns about greenwashing.

Some consumers opt for online shopping for low-priced garments, order multiple sizes or colors and return unwanted items. However, they do not realize this practice raises sustainability concerns, as returned garments often become deadstock or end up in landfills, particularly those made from low-quality fabrics.

Nevertheless, the resale market is evolving in the post-COVID-19 era. According to ThredUP, the gross merchandise value of the global second-hand apparel market is projected to grow with a CAGR of 12% between 2023 and 2028, as more individuals resell apparel for extra income. Conversely, a BoF-McKinsey survey conducted in 2024 indicated that 75% of value-seeking consumers prefer buying from outlets or off-price retailers rather than second-hand channels, suggesting that the resale model may not always appeal to consumers.

### Case of SHEIN Exchange

SHEIN, one of the world's largest fast fashion brands, launched its second-hand resale platform, SHEIN Exchange, in 2022. According to their Sustainability Report 2023, 4.2 million new users registered and purchased over 115,000 pre-owned items in the year. While this performance is remarkable, SHEIN's ability to launch over 1000 new designs daily may limit the circular impact of SHEIN Exchange.

Although some consumers are willing to purchase second-hand or recycled garments, they may dispose of the garments as usual when they tire of the style. This action fails to prolong the garments' lifetime and undermines the sustainability goals of circular fashion.

### Business Considerations

Apparel suppliers traditionally adopt a linear fashion model – design, make, consume, dispose. Stakeholders face the following challenges when they attempt to transition to circular models.

#### i. Managerial Challenges: Resistance to Adjust Business Models

The transition to circularity is significantly hindered without top management support. Inadequate resource allocation and ineffective strategy implementation threaten the scalability of circular initiatives. Adopting a reverse supply chain disrupts existing workflows, requiring new business philosophies and interdisciplinary collaboration. For instance, fashion designers may worry about limitations on styles and scalability, requiring early collaboration with technical specialists to evaluate product durability and recyclability. Sales teams may resist moving from a sales-centric model to one focused on garments' lifetime, potentially lowering sale values. Logistics teams also struggle with unpredictable return schedules, as handling individual returns incurs high costs. Additionally, acquiring resources and recruiting talent with sustainability principles needs a shift in education paradigms.

#### ii. Financial Challenges: Hesitate to Alter Assessment Mechanisms

A short-term profit focus may undermine long-term circularity goals, as embracing garment reuse may reduce sales revenue. Moreover, justifying investments in circular business models is challenging due to high recycling costs and the need for substantial upfront investments in materials, product redesign, new equipment, and collection solutions. Textile recycling, in particular, elevates operating costs for trim removal, purification, and cleaning. Circular models often fall short of the profit expectations set by traditional linear strategies.

### Financial Performance Matters

An interview with a fashion executive of a world-renowned company in September 2024 revealed that an innovative upcycling initiative aimed at collecting high-quality raw material leftover to curate new collections was discontinued. Despite its consumer appeal and positive environmental impact, this sustainable project was deemed less profitable than traditional linear business orders, illustrating the financial concerns faced by sustainable initiatives.



**Different Profit Focus**

Financial statements of fashion companies advocating sustainability always look less appealing than those of fast fashion brands that dominate the market with affordable styles. In 2020, net sales of H&M exceeded US\$20 billion, while Patagonia, known for its commitment to sustainability, reported net sales exceeding US\$200 million. To a certain extent, the huge difference in financial results reflect diverse company visions

**iii. Technical Challenges: Recycling Constraints**

The growing variety of fabric blends complicates recycling efforts, increasing sorting and recycling costs. Nowadays, the garment industry extensively uses blended fabrics, combining two or more types of fibers to enhance textile qualities. For instance, polyester improves the colour stability and abrasion resistance of cotton, while being more cost-effective than natural materials. However, mechanically separating blended fabrics into individual components is difficult, as the recycling process can alter material characteristics, resulting in inconsistent dye absorption.

Many garment experts acknowledge that post-consumption recycling technologies have yet to achieve the desired fabric quality, particularly for worn or damaged textiles. Recycled fabrics are typically lower in quality and more costly than that of virgin materials. Downcycling into lower-value applications, like insulation or wiping cloths, is commonly observed. Maintaining textile purity is challenging, especially when feedstocks are collected from various sources, introducing contaminants that hinder achieving virgin-level quality. Furthermore, garments contain non-textile components, including labels, zippers, buttons, and sewing threads, which complicate recycling efforts.

International institutions and academia have extensively researched recycling within sustainability, with circularity emerging as a promising eco-friendly alternative. However, many brands prioritize preferred textiles over textile-to-textile recycling. For instance, Patagonia aims to exclusively use preferred textiles by 2025. Currently, over 90% of their recycled polyester comes from plastic bottles and fishing nets rather than garment disposals.

Figure 1: Fiber portfolio in 2023

Fibers	H&M	Lululemon	SHEIN
Polyester	23% (79%*)	33% (61%*)	76% (6%*)
Cotton	59% (11%*)	19% (Not specified*)	10% (Not specified*)
Nylon	–	31% (6%*)	–
Others	18% (Not specified*)	17% (Not specified*)	14% (Not specified*)
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

\*Note: % level of recycling

Notably, introducing new fabric does not address the growing issue of garment disposal. More importantly, recycled polyester releases more microfibers than virgin polyester during washing. Discarded recycled polyester garments may contribute to soil degradation and water pollution.

Furthermore, the rapid development of new materials often outpaces the infrastructure needed for effective management and reintegration into circular supply chains. For example, biosynthetics, derived from bio-based sources, are not biodegradable, raising sustainability concerns.

**iv. Operational Challenges: Store Management**

Resale business models face scalability issues due to a lack of product standardization. Small second-hand boutiques often rely on manual product tracking, which is inadequate for expansion through franchising or online platforms. Efficient management of diverse products requires an integrated tracking and data collection system to meet customer demands. Online second-hand marketplaces, offering transparent product information, increasingly attract Gen Z and millennial consumers. However, these platforms have to invest in logistics and inventory management. Without significant order scale, business sustainability remains a concern.

**v. Logistics Challenges: Complex Reverse Flow and Limited Infrastructure**

The decentralized garment disposal systems and inconsistent material mix lead to non-standardized feedstocks. The complicated collecting, sorting, and recycling processes hinder economic viability. Limited clothing collection venues and recycling plants discourage brands from pursuing recycling initiatives, while establishing internal recycling facilities poses financial challenges especially for small businesses. The infrastructure dispersion hinders feedstock collection.



## IMPLICATIONS

Extending the garments’ lifetime, effectively managing disposals, and transferring the potential value of garments are important for circular fashion development. However, without significant technological breakthroughs, scalable and economically viable models seem unattainable.

To address the technical constraints, the Hong Kong Research Institute of Textiles and Apparel is developing a smart garment sorting system using artificial intelligence to identify garment types, fabric structures, colours and materials. The system aims to sort bulk garments effectively. As of

February 2025, the system generates sorting results in 8 seconds with an accuracy rate of 90%-95%. It is now under project development, and further resources are essential for advancing this solution from a laboratory to an operational scale.

In sum, effective regulations and incentives are crucial for proper waste management and fostering innovative circular initiatives to protect the planet and ensure the well-being of future generations.



**Winnie Lo** is currently a part-time PhD student at the Division of Public Policy at HKUST, focusing her research on the circular economy. She believes embracing a circular model in any market requires collaboration among and support from communities, businesses, and governments. Her goal is to bridge the gap between the stakeholders along supply chains by conducting research that sheds light on the benefits and challenges of circular economy practices.

Besides, she serves as a full-time researcher at HKUST Li & Fung Supply Chain Institute. Her major research areas cover China’s innovative business models, cross-border e-commerce, logistics, and supply chain. She has published a book, named ‘Supply Chain Management – The Fung Group Experience (Chinese only, over 300 pages)’ in 2021. She has also contributed chapters with the theme of China’s retail logistics to the ‘Blue Book of China’s Commercial Sector’ published by the Chinese Academy of Social Sciences.



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