BCG

FASHION FOR GOOD

SCALING NEXT-GEN MATERIALS IN FASHION

AN EXECUTIVE GUIDE

FEBRUARY 2025

ABOUT

Fashion for Good is the pioneer of collaborative innovation in the fashion industry. Its Innovation Platform connects brands, manufacturers, innovators, and funders to jointly transform the industry and to bring new ideas and technologies from niche to norm. Fashion for Good's programs are supported by founding partner Laudes Foundation, co-founder William McDonough and corporate partners, adidas, Arvind Limited, BESTSELLER, Birla Cellulose, C&A, CHANEL, Inditex, Kering, Levi Strauss & Co., Norrøna, ON, Otto Group, Paradise Textiles, Patagonia, PDS Limited, PVH Corp., Reformation, Shahi Exports, Target, Teijin Frontier, and Zalando.

Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders—empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact.

Our diverse, global teams bring deep industry and functional expertise and a range of perspectives that question the status quo and spark change. BCG delivers solutions through leading-edge management consulting, technology and design, and corporate and digital ventures. We work in a uniquely collaborative model across the firm and throughout all levels of the client organization, fueled by the goal of helping our clients thrive and enabling them to make the world a better place.


NDER NEWSPAPER
AND UNIQUE

TABLE OF **CONTENTS**

INTRODUCTION

Materials lie at the heart of the fashion industry. They form the foundation of every garment, shaping the design, feel, and functionality of the product. They also define the brand's narrative and its appeal to consumers. Beyond aesthetics, materials are pivotal to the fashion industry's environmental footprint: They account for 92% of the industry's total emissions through their extraction, processing, and production.[1] When it comes to the cost structure of garments, materials represent around 30% of cost of goods sold (COGS)—ranging from 15–25% in luxury to up to 60% in the mass market.[2]

The global landscape is shifting rapidly, with climate change intensifying resource scarcity, geopolitical dynamics disrupting supply chains, and evolving business models demanding greater sustainability, waste valorization, and transparency.

Many brands, however, remain unequipped for the material transition already underway. According to BCG analysis, more than 80% of fashion companies lack sustainable sourcing targets covering all six key materials—cotton, polyester, nylon, man-made cellulosic fibers (MMCFs), leather, and wool.

While preferred materials such as regenerative cotton and bottle-to-textile recycled polyester contribute to improving sustainability, they only partially address the industry's challenges, emphasizing the urgency of next-generation (next-gen) materials to deliver deeper and broader impact.

Next-gen materials, including textile-to-textile recycled polyester or lab-grown cotton represent a critical opportunity for the fashion industry to significantly transform its impact. (See "Key Definitions.") These are innovative fibers and materials with enhanced sustainability, performance, or functionality that are currently in early commercialization or development and require further technological advancement and cost optimization for widespread adoption. Embracing these materials is becoming a business imperative, driven by tightening regulations in Europe and beyond, shifting consumer demands, and rapid technological advances. With demand for these materials projected to outpace supply by 2030, the need for collective industry action is today more urgent than ever.[3] This business case will be a key factor in accelerating the next-gen transition.[4]

1 World Resources Institute and Apparel Impact Institute, *Roadmap to Net Zero: Delivering Science-Based Targets in the Apparel Sector*, 2021. The term "materials" refers to the cultivation and extraction of raw resources from the earth, plants, or animals, and their processing into yarn and finished fabrics.

2 BCG analysis.

3 BCG analysis of the raw material commitments of over 30 leading fashion brands and retailers, representing nearly 25% of the global apparel and footwear industry, indicates that the volumes needed to transition their material base in alignment with these commitments and growing regulatory pressure to increase the use of recycled fibers, will exceed supply.

4 BCG, Quantis, and Textile Exchange, *Sustainable Raw Materials Will Drive Profitability for Fashion and Apparel Brands*, BCG.com, October 2023.

KEY DEFINITIONS

Next-generation fibers and materials:
Novel and innovative fibers and materials with desired improved environmental and/or social outcomes when compared with conventional options; are currently in early stages of commercialization or development; and require further technological advancement and cost optimization for widespread adoption. This next generation of fibers and materials promises to advance solutions for the sustainability and circularity challenges faced by the industry. The vision is for these materials to transition from "next generation" to "preferred existing" status.

Preferred existing fibers and materials:
Fibers and materials that deliver consistently reduced impacts and increased benefits for climate, nature, and people compared to conventional equivalents through a holistic approach to transforming production systems. These solutions are commercially established and can be seamlessly integrated into existing supply chains from a technological perspective, but potential systemic challenges (such as price or supply chain integrity) to drive scale still need to be addressed.[5]

To learn more about the different next-gen materials, see "Appendix: Glossary.")

So how can fashion brands address financial, technical, and operational barriers to scaling next-gen materials? This report serves as a blueprint for industry leaders.

In the chapters ahead, we outline actionable steps to build robust material strategies, de-risk investments in next-gen technologies, and contribute to scaling innovations that are set to redefine the future of fashion.

5 This definition is adapted from Textile Exchanges' 2023 publication, *Preferred Fibers and Materials: Definitions.*

CHAPTER 1: SCALING NEXT-GEN MATERIALS

Next-gen materials offer a vital solution for future business growth and the achievement of the fashion industry's sustainability goals. They present significant opportunities during a time of mounting challenges, including climate change, textile waste accumulation, geopolitical turbulence, tightening regulations, and commodity competition. (See "Mounting Challenges for the Fashion Industry.")

MOUNTING CHALLENGES FOR THE FASHION INDUSTRY

Various challenges are top of mind for fashion companies, especially as they relate to conventional materials.

Climate change is making the supply of natural fibers increasingly volatile, with agricultural production and resource availability under mounting pressure. The increasing volatility in the supply of natural fibers due to climate change is a critical concern for the global textile industry, with significant implications for pricing, availability, and long-term sustainability.

- Increased humidity contributed to Pakistan's cotton production falling to a 30-year low of 5.6 million bales in the 2023–2024 growing season, along with a decline in fiber quality.[6]
- Extreme weather in Mongolia has raised cashmere prices by 11–18%, while severe drought in Australia is projected to cause a 30% decline in wool production levels before the drought.[7]

6 *The Express Tribune*, "Cotton Harvest Drops to 30-Year Low Last Season," *The Express Tribune* website, January 11, 2025.

7 *Financial Times*, "Drought Pushes Australia's Sheep Flock to 100-Year Lows," September 10, 2019; Australian Wool Innovation Limited, "Australian Shorn Wool Production Estimate of 318 Mkg Greasy in 2023/24 and Forecast 285 Mkg Greasy for 2024/25," August 16, 2024; Austrialian Government, "Wool Exports Snapshot: December 2021." Between January 2017 and July 2019, Australia experienced an unprecedented drought that reduced the nation's sheep flock to its lowest level in 100 years, putting the $2 billion wool industry at risk. Wool production in Australia is projected to reach 285 million kilograms by 2025, marking a 10% decline from 2024 levels and a significant drop of over 30% compared to the 414 million kilograms produced in 2017, prior to the drought.

Geopolitical turbulence is disrupting global supply chains, challenging traditional sourcing patterns across the fashion industry. From trade route disruptions to the inaccessibility of key raw material regions and shifts in trade agreements, the stability and reliability of material supplies are under pressure.

- The war in Ukraine has disrupted raw material imports from Asia, causing delays, rising costs, higher textile prices, and inflationary pressure.
- In the US, further tariffs on Chinese imports have been imposed, adding another layer of complexity to the global trade landscape and intensifying sourcing challenges.

These shifts underscore the need for more resilient and diversified sourcing strategies.

Tightening regulations are increasingly compelling companies to build greater sustainability capabilities and to adjust their business models by requiring greater traceability capabilities, changes in product design and advanced sourcing strategies.

- The Netherlands aims to achieve 5% textile-to-textile recycled content in consumer clothing by 2027, with an annual increase of 2–3%.[8]
- France's Extended Producer Responsibility scheme for textiles establishes fees of up to $0.06 and averaging to $0.01 per garment for products that have not been designed to minimize environmental impact.[9]
- In the US, the ban on cotton imports from China's Xinjiang region triggered significant reshuffling of global cotton sourcing and contributed to US cotton futures reaching a ten-year high of $1.05 per pound in 2021.[10]

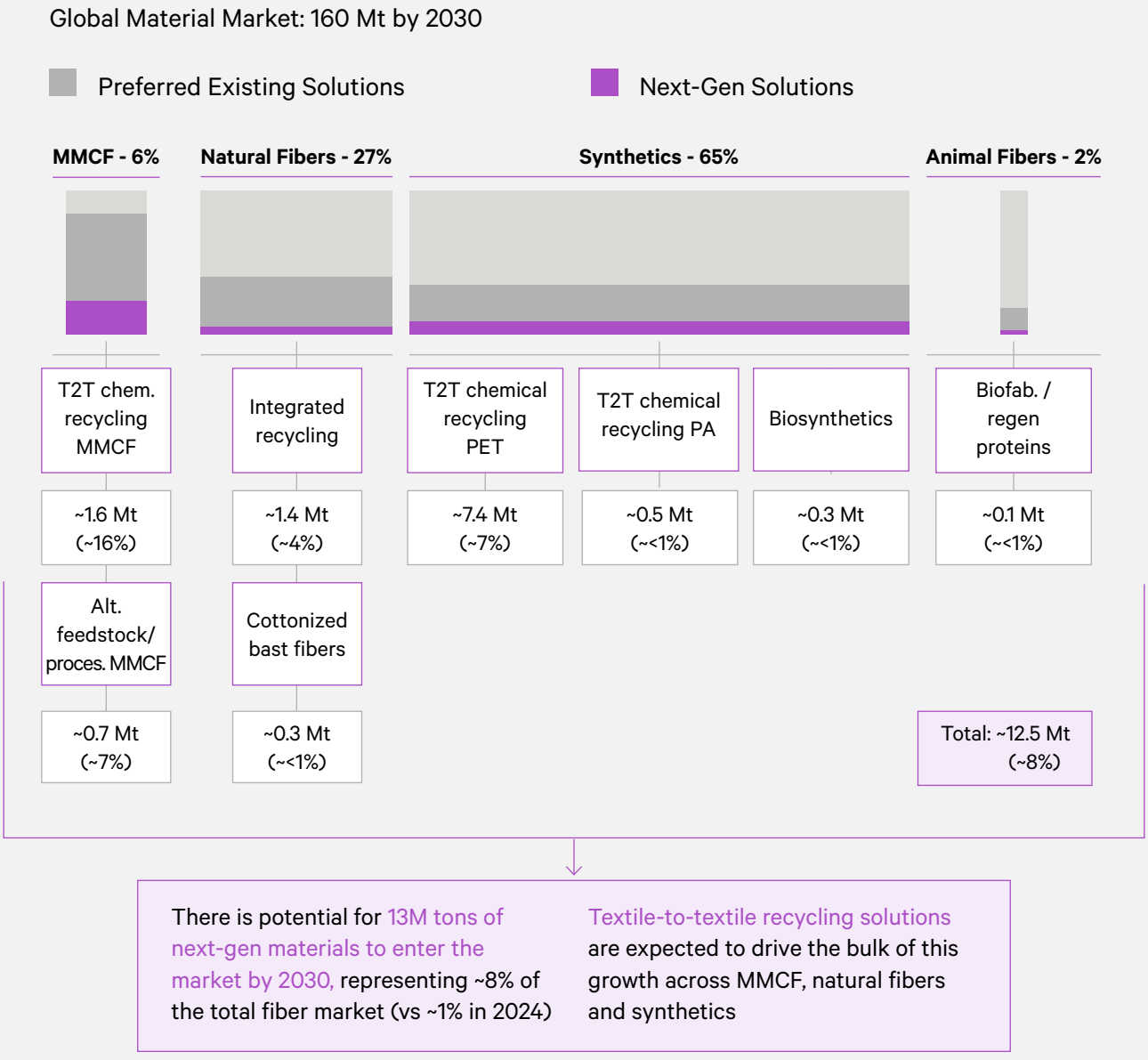
Commodity competition is intensifying demand for polyethylene terephthalate (PET) bottles from the packaging industry due to the stricter regulations in the food and beverage industry. Within EU, for example, by 2025, plastic bottles must contain at least 25% recycled content, increasing to 30% by 2030.[11] This creates a competitive landscape for PET resources, particularly as these materials are also in demand for recycling and reuse in other industries, such as textiles. Transitioning from PET bottles to alternative raw materials within the textile sector could help reduce the pressure on PET demand.

Next-gen materials provide solutions to navigate these challenges, helping brands meet changing prerequisites, evolving regulations, and consumer expectations while unlocking opportunities for sustainable growth.

8 TAUW, *Performance Requirements for Textiles Input on EU Sustainable Design Criteria for Textiles*, 2023.
9 WRAP, Textiles Extended Producer Responsibility (ERP), January 2024.
10 Kirk Maltais, "Cotton Prices Surge to Highest Level in Decades," *The Wall Street Journal* website, October 5, 2021.
11 European Parliament, "Plastic Waste and Recycling in the EU: Facts and Figures," European Parliament website, December 19, 2018.

By 2030, there is the potential for nearly 13 million tons of next-gen materials to enter the market, representing around 8% of the total fiber market. (See Exhibit 1.) Although a vast improvement from today's almost 1% of the total fiber market, this progress will be barely sufficient to meet the industry's broader needs.[12] Without a strong, coordinated effort, access to these materials will remain limited to some brands, benefiting only a small fraction of the market while leaving the majority struggling to pivot.

EXHIBIT 1: Demand for Next-Gen Materials Is Projected to Outpace Supply by 2030



Sources: Fashion for Good data and analysis; Textile Exchange, *Materials Market Report 2024*; BCG.
Note: Fiber production data based on primary and secondary sources. Assumptions were applied to primary data, including capacity growth rates, factors for entities/technologies ceasing by 2030, and adjustments for unrecorded market players. See "Appendix: Glossary" to learn more about the various next-gen materials.

12 BCG, Quantis, and Textile Exchange, *Sustainable Raw Materials Will Drive Profitability for Fashion and Apparel Brands*, BCG.com, October 2023.

The bulk of next-gen material growth is expected to come from textile-to-textile recycling solutions, which are poised to gain significant market share in man-made cellulosic, natural, and synthetic fibers. This momentum is driven by industry prioritization of recycling technologies and the increasing focus of legislation on waste management and circularity. Next-gen recycling, particularly chemical recycling, utilizes diverse waste feedstocks. The ability of solution providers to handle these materials depends not only on the underlying technology but also on the sophistication of preprocessing steps integrated into their systems. Solutions that demonstrate the capacity to process a broader range of waste feedstocks effectively can be considered more innovative than standard recycling methods. It is expected to dominate next-gen material growth by producing high-quality outputs and reducing reliance on virgin resources.

Partly biosynthetics are already available, but 100% biosynthetic options face challenges, including issues such as limited performance, supply chain compatibility, and dyeing constraints. Fully bio-based PET is still expensive and complex to produce, though advancements in processes and feedstock innovation are expected to enable scaling. With growing demand and reduced reliance on fossil fuels, next-generation biosynthetics are expected to overcome these barriers and gain market share.

Cultivated cotton is expected to remain the dominant plant fiber in 2030, as few alternatives have scaled to fully replace it. Emerging solutions often rely on inputs cultivated directly for textiles or derived from agricultural residues. Innovations in this area focus on processing these fibers, or “cottonizing” them, for use in cotton spinning systems. However, limitations in hand feel, aesthetics, and supply chain traceability remain hurdles for scaling these solutions. Recycled cotton fibers, developed through integrated recycling processes are expected to achieve a higher market share of around 4% by preserving the key characteristics of natural cotton. Given these limitations, alternative natural fibers are expected to maintain a smaller market share due to the time required to scale supply chains. Although cottonized hemp shows strong potential, particularly in denim applications, which could act as a starting point for broader adoption.

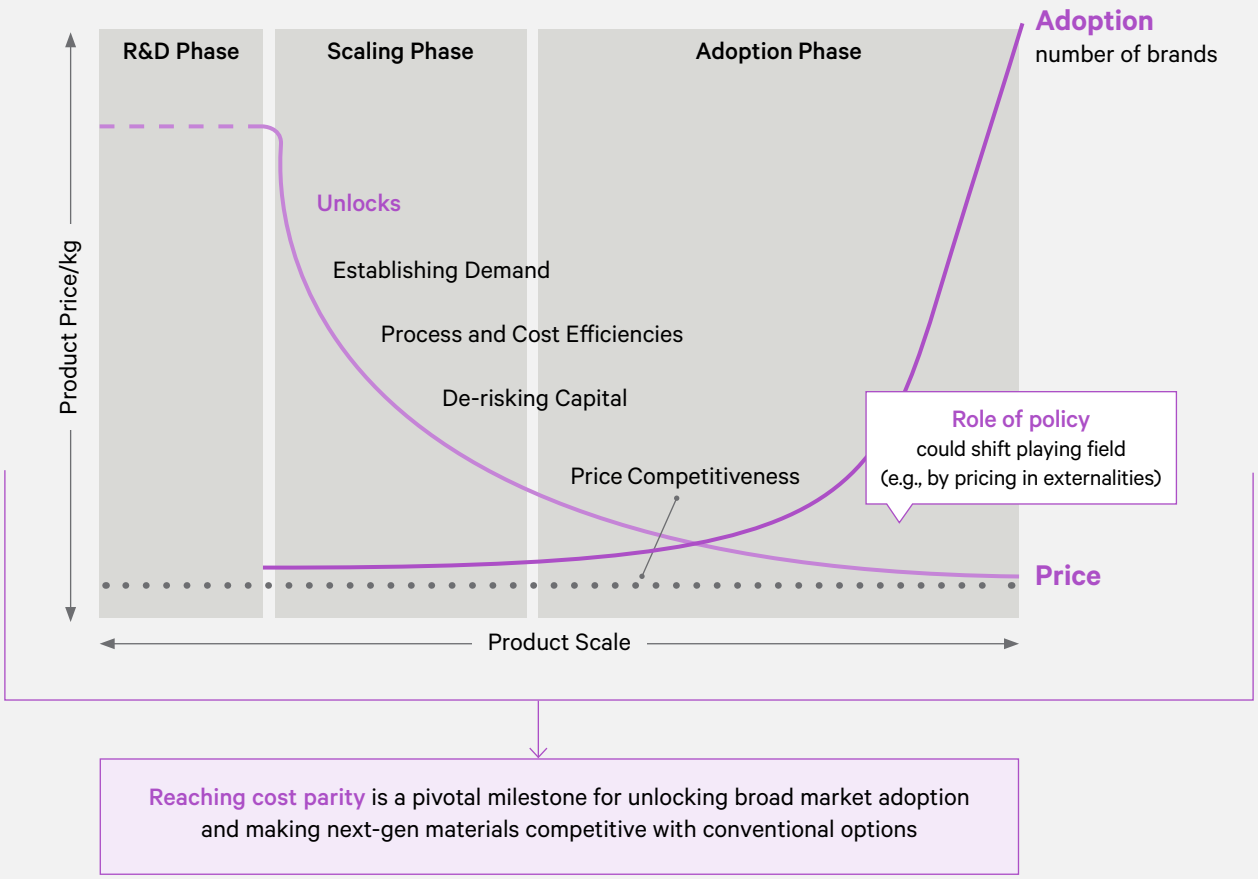
By 2030, next-generation fibers and existing materials will coexist, offering brands a diverse portfolio of solutions to meet their sustainability goals. Accelerating development, reducing investment risks, and fostering collaboration will be critical to building a more resilient and sustainable material supply chain.

Next-gen materials are pivotal to the future of fashion, yet their adoption faces barriers, including high initial costs, lengthy development cycles, and uncertainty around performance and scalability. Overcoming these challenges requires scaling production to meet industry demand while ensuring that their quality and pricing match—or surpass—those of conventional materials, paving the way for their widespread utilization.

The adoption journey of next-gen materials follows a well-established pathway. (See Exhibit 2.) The evolution transitions through stages from R&D and validation pilots to a scaling phase, and ultimately to an adoption phase where they become mainstream options. While the journey is mainly defined by accelerating industry adoption, this path is also inversely tied to the price curve, with costs decreasing as adoption increases.

EXHIBIT2: Scaling Innovations Requires a Systematic Approach to Transition Pricing

Next-gen cost curve



Sources: Fashion for Good and BCG.

Until the technology or material is scaled, the price curve remains in the "transitional phase," where higher prices reflect early-stage development costs, rather than premiumization—a necessary step of the adoption curve seen in fashion and other industries. The most effective way to bend the curve and ultimately drive down costs is through accelerating the scaling phase: as production ramps up and processes become more efficient, costs decline significantly, allowing the materials to compete with conventional options and become widely adopted by the industry. This evolution depends on a complex interplay of factors: rising availability, improving unit economics, expanding production capacity, and optimizing utilization. Achieving cost parity represents a pivotal inflection point, unlocking broader market adoption, further pushed by today's context, where rising costs of conventional fibers—driven by climate change, supply disruptions, and regulatory impacts—are expected to level the playing field, improving the transition price development target for next-gen alternatives.[13]

13 BCG, Quantis, and Textile Exchange, *Sustainable Raw Materials Will Drive Profitability for Fashion and Apparel Brands*, BCG.com, October 2023.

Bending this cost curve for next-gen materials is a shared responsibility that requires bold, coordinated action: by aligning efforts across **demand, cost, and capital,** the fashion industry can unlock the full potential of material innovation, ensuring a sustainable and competitive future for all players. Other industries—from automotive industry with EVs to the food industry with alternative proteins—have demonstrated how next-gen technologies can scale rapidly, offering valuable insights for overcoming adoption challenges. Solar energy, for example, achieved an 89% cost reduction in a decade through technological advancements, cost efficiencies, and regulatory support. However, the fashion industry, for the most part, has struggled to accelerate adoption in emerging, innovative materials.

Exceptions of material innovation and scaling in fashion have historically spanned decades due to significant barriers such as fragmented supply chains and intense cost and margin pressures. Nevertheless, these pioneers demonstrate how innovation, demand creation, and supply chain integration can drive the adoption of sustainable materials. (See "Three Case Studies in Scaling and Mainstream Adoption.")

THREE CASE STUDIES IN SCALING AND MAINSTREAM ADOPTION

Spandex

A well-known example of how scaling brought mainstream adoption and significantly decreased material costs is spandex. A synthetic fiber renowned for its exceptional elasticity and durability, spandex developed in the 1950s. Initially marketed under the brand name LYCRA®, it was introduced as a lightweight and versatile alternative to rubber in bodywear and shapewear. At its launch, spandex was prohibitively expensive, priced at approximately $100 per kilogram, limiting its use to niche applications.

The fitness boom of the 1980s marked a turning point, as spandex became integral to activewear and sportswear. Brands like Nike and adidas utilized it to create garments offering superior flexibility and comfort. Lycra revolutionized the sportswear market, driving demand and enabling economies of scale that reduced costs to $35-40 per kilogram.

By the early 1990s, spandex expanded into everyday apparel, most notably in denim, where it added stretch and comfort to traditional jeans. This innovation broadened its appeal and reduced prices further to $25 per kilogram. As stretch fabrics became a staple in fashion, oversupply from Asian manufacturers drove prices down to $5-9 per kilogram by the 2000s, solidifying Lycra's ubiquity across categories such as underwear, hosiery, and casual wear.

Spandex has become a cornerstone material in the fashion industry, with the global market projected to reach approximately $19 billion by 2031, expanding at a CAGR of 7.6% from 2023 to 2031.

This transformation from a specialized material to a mainstream textile illustrates how scaling production, technological advancements, and surging market demand can transform a high-cost innovation into an affordable and indispensable product.

Lyocell

Lyocell was developed in the 1970s as a cleaner alternative to rayon but took nearly 30 years to scale. Its adoption accelerated after Lenzing AG acquired the technology in the 2000s, integrating it into its production and expanding applications to denim, sportswear, and home textiles. Initial cost premiums of 30–50% compared to viscose were gradually reduced to 5–7% through technological advancements, increased production, and competition following patent expirations. By 2024, Lyocell accounted for 5% of the man-made cellulosic fibers market, with annual production exceeding 0.37 Mt and widespread adoption by major fashion brands.

ECONYL®

Similarly, ECONYL® regenerated nylon, introduced by Aquafil in 2011, has scaled over a decade through innovative recycling processes that transform waste like fishing nets and carpets into high-quality nylon. Initial adoption focused on carpets, but partnerships with fashion brands like Prada and adidas expanded its applications. Strategic upstream integration, including acquisitions and collaborations with waste management companies, reduced costs and improved feedstock efficiency. ECONYL® now represents 54% of Aquafil's revenues and is expected to reach 60% by 2025, with an annual capacity of 40,000 tons.

Scaling next-gen materials requires a targeted approach centered on activating **three levers at the right time:**

Demand. Consistent demand signals stabilize markets, attract investment, and provide the foundation for scaling next-gen materials.

Cost. Cost engineering, process optimization, and efficiency investments unlock economies of scale, driving affordability and adoption.

Capital. Strategic financing aligned with each phase of the adoption curve ensures sustained growth and scaling potential.

These levers, **deeply interconnected,** hold the power to transform next-gen materials from innovations into mainstream solutions. It is this **combined action**—underpinned by a well-functioning organization, expertise, and resources—**that will bend the cost curve,** accelerate next-gen materials adoption, and define the winners in the next era of sustainable fashion.

Chapter 2: Seizing the Next-Gen Advantages

Unlocking the power of next-gen materials demands nothing less than a **synchronized effort across the entire value chain.** Three stakeholders—innovators, brands, and supply chain partners—are key here. Innovators are the architects of possibility, brands the catalysts of demand, and supply chain partners the gatekeepers of adoption. To succeed, they must collectively act with purpose. This chapter focuses on drafting a blueprint for CEOs and other leaders, exploring brands' role both as individual actors and as part of collective industry efforts.

The Brand Agenda: A Business Imperative

The **transition** to next-gen materials is a **business imperative for brands to remain competitive.** Materials, representing 15–60% of COGS, expose companies to risks from price volatility, legislation, and supply chain disruptions over the next 5–10 years. A timely, holistic shift can mitigate these risks, delivering a ~4% COGS reduction vs. inaction within 5–6 years and further gains as price stability, compliance, and scale efficiencies take effect. (See Exhibit 3.)

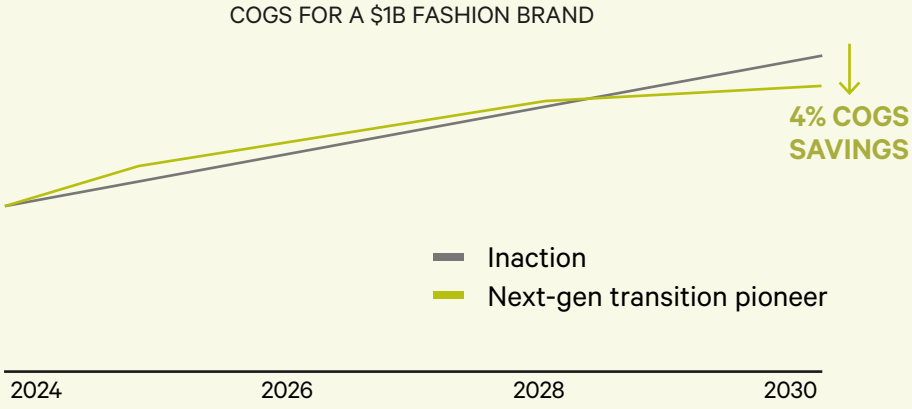
EXHIBIT 3: How Becoming a Next-Gen Transition Pioneer Can Bend the Cost Curve

INACTION

- 2030 material mix: 20% preferred, 80% conventional
- Continued rise in material costs and persisting price volatility
- Increasing cost of inaction driven by market shifts, noncompliance/regulatory impacts, and amplifying risks

ACTION - NEXT-GEN TRANSITION PIONEER

- 2030 material mix: 25% next-gen, 65% preferred, 10% conventional
- Next-gen transition requires 1.5–3% of COGS investment annually over the first 3 years
- Proactive adoption bends the cost curve, enabling a 4% COGS reduction by securing materials at favorable terms and reducing cost volatility



Source: BCG.
Note: Illustrative analysis for a $1B global mass market fashion brand with 40% COGS; starting point 80% conventional with a higher share of natural vs synthetic fiber mix.

Paving the Path to Next-Gen Adoption

Next-gen materials represent a transformative opportunity for brands, but readiness demands more than ambition—it requires a structured approach to align strategy, operations, and resources. In this context, brands need **a clear, actionable framework** ensuring efforts are focused, scalable, effective, and aligned with the overall business model. The framework outlined, informed by industry best practices and the successes of early movers, provides **a pathway to address key challenges while driving measurable results.**

To start the journey toward the transition to next-gen materials, brands must assess their readiness on **business strategy and organization.** These **prerequisites** lay the foundation for all other actions and provide the structure, alignment, and accountability required to navigate the complexities of adoption and scaling. With this foundation in place, brands can direct their efforts toward **the three levers of demand, cost, and capital,** individually and/or collectively. (See Exhibit 4.)

EXHIBIT4: Key Levers and Foundation to Bend the Next-Gen Materials Adoption Curve

SCALE

	INDIVIDUAL ACTIONS	COLLABORATIVE ACTIONS
DEMAND	**Commit & Uphold Demand** • Define demand planning, set public targets • Utilize offtake agreements & letters of intent • Implement transition financing mechanisms	**Demand Pooling** • Pool demand across multiple brands • Collective transition financing mechanisms • Enable policies to incentivize uptake
COST	**Drive Process Efficiency** • Establish standardized fabric specifications • Reinforce relationships w/ nominated suppliers • Build joint R&D efforts with suppliers	**Drive Supply Chain & Cost Efficiencies** • Develop shared fabric specifications • Nominate common suppliers to pool volumes • Enable access to low-cost feedstock
CAPITAL	**Unlock Financing** • Set up joint development agreements • Offer equity investment (direct or CVC) • Provide expertise and networks to innovators	**Collaborative Financing** • Form targeted consortia for equity financing • Collaborate with brands to share financial risk • Use collective efforts to signal to confidences
FOUNDATION: Business Strategy & Organization	• Integrate next-gen materials in core strategy • Establish actionable transition roadmap • Build cross-functional innovation team • Define incentives & KPIs across organization	• Engage with industry platforms • Leverage expertise through partnerships • Utilize joint infrastructure & resources • Align efforts with other brands/stakeholders

Sources: Fashion for Good and BCG.

Laying the Foundation: Business Strategy and Organization

Effective implementation begins with **embedding next-gen ambitions into the company's core business strategy** and ensuring they are **fully aligned with overarching financial targets.** This alignment is critical to secure the necessary resources, drive accountability, and position next-gen materials as a long-term business priority rather than a siloed initiative. Building this foundation requires a detailed understanding of the **brand's starting point,** including its current material mix, sourcing landscape, and existing supplier engagement, as well as interactions with external stakeholders—such as innovators, suppliers, and platforms. This assessment helps brands identify risks, including regulatory changes and pricing pressures, while uncovering opportunities to enhance resilience through next-gen solutions.

Strategy and Targets. Next-gen ambitions must be integrated into the core business strategy. Clear, measurable targets should guide efforts, align with overarching business objectives, and inspire organization-wide commitment to innovation.

Implementation Roadmap. A detailed, actionable roadmap is essential to drive progress. This roadmap should define short- and medium-term goals, ensuring that milestones are achieved systematically and providing a clear framework for measuring progress.

Organizational Structure. A specialized materials and innovations team is critical to accelerate next-gen solutions and foster cross-functional collaboration. To transform next-gen material concepts into market-ready products however, every function—from design, product development, merchandising, sourcing to finance—must operate under a cohesive strategy with clear incentives and well-defined KPIs to ensure seamless coordination and ownership across the organization.

Analysis by BCG of more than 30 leading fashion brands and retailers, representing nearly 25% of the global apparel and footwear industry, highlights disparities in the adoption of material innovations. Those that have successfully embedded these foundational elements are better positioned to adopt next-gen materials and achieve significant progress in driving innovation.

For example, adidas committed in 2017 to phasing out virgin polyester in favor of recycled alternatives by 2024, setting phased milestones such as achieving over 50% recycled polyester usage by 2020. A notable range of brands, including Bestseller, Inditex, Kering, ON, and PVH Corp. have established specialized materials and innovation teams, and are working on strategic roadmaps and targets, all to scale next-gen materials effectively. These teams, typically composed of at least two to four dedicated experts foster cross-functional collaboration to ensure strategic alignment and operational integration, as well as transforming next-gen material concepts into market-ready products. Equipping these innovation teams with the right tools, training, and knowledge through strategic investments in workforce training, advanced skill development, and process optimization is essential to their success.

In a highly fragmented fashion industry, however, many individual brands often lack the scale or resources to drive meaningful change independently. **Aligning efforts across multiple stakeholders—**brands, suppliers, innovators, and financiers—can amplify impact, unlock efficiencies, and accelerate the adoption of sustainable materials. Platforms like OCA, Textile Exchange and Fashion Pact, which target preferred materials and Fashion for Good and

Canopy, which focus on next-gen materials have emerged as critical enablers.[14] These platforms provide the infrastructure, resources, and networks needed to foster collaboration, bridging the gap between innovation and scalability. They also enable brands to leverage expertise and partnerships to achieve their sustainability goals and drive broader industry transformation.

> **Our approach to next-gen materials focuses on strategic target setting, product development support, market making and investments. Through our collaboration with next-gen innovators, we have come to appreciate that scaling these solutions is an iterative process"**
> **Javier Losada Montero**, Chief Sustainability Officer, Inditex

14 Textile Exchange drives the scaling of preferred materials through certifications, benchmarking tools, and collaborative partnerships across the supply chain. OCA highlights the impact of coordination, supporting over 70,000 farms—primarily in India, Pakistan, and Turkey—in transitioning to organic farming. Their efforts have increased the organic cotton supply and strengthened market demand through partnerships with major brands. Similarly, the Fashion Pact's Unlock Programme aims to help farmers adopt regenerative farming practices, showcasing the potential of collective action to scale low-impact agricultural methods.

CHAPTER 3: WHAT BRANDS CAN DO INDIVIDUALLY

Once the foundation is in place, brands are positioned to activate the three critical levers of **demand, cost, and capital** to drive scale and effectively bend the next-gen materials cost curve. This transformation can be achieved through individual initiatives, collaborative efforts with other brands and suppliers, or a combination of both approaches for maximum impact.

Lever #1: Demand

Committing and upholding demand is a key lever that can be implemented individually and tailored to align with each brand's unique starting point, strategic priorities, and investment capacity.

Define demand planning and set public targets. Clear demand planning from brands and retailers is essential to scaling next-gen materials efficiently. Rooted in material roadmaps and public targets, these signals between brands, innovators and often supply chain partners—such as **offtake agreements, commercial agreements, or letters of intent**—send strong market messages and establish clear internal roadmaps.

These signals or agreements align cross-functional teams with measurable targets while offering brands strategic benefits like preferred access, influence over quality refinements, and geographic expansion. For innovators, they provide demand certainty, support capacity planning, and act as proof points for securing funding by demonstrating market validation and revenue potential. They often act as **partnership tools,** fostering deeper collaboration across the value chain and signaling confidence to the broader market. Examples include:

- Inditex's $73 million offtake agreement with Ambercycle over a three-year period
- PUMA's multiyear partnership with Spinnova for a reliable supply of wood-based SPINNOVA® fiber products through its collaboration with Woodspin Oy
- H&M Group's $600 million, seven-year agreement with textile-to-textile recycler Syre

Implement transition financing mechanisms. Even with clear offtake agreements in place, the internal adoption of next-gen materials is not always immediate. Commercial and product teams often prefer established, tested, and cost-optimized materials and need support to switch to and scale next-gen materials. **Transition financing mechanisms** can strengthen internal demand for new materials. This approach helps ease internal resistance by shielding commercial teams from the immediate financial impact. It allows them to focus on **integrating next-gen materials** into product lines **without the burden of justifying higher costs** to customers. The strategy serves as a bridge, supporting adoption until scaling efficiencies bring costs in line with market expectations.

Many brands are piloting next-gen materials within R&D budgets, but strategies to manage the cost premiums for large-scale adoption are emerging. Leading companies are bridging this cost gap by integrating next-gen material plans into their financial strategies through **centralized transition financing mechanisms.** These systems temporarily decouple the premiums for the next-gen materials, encouraging adoption, relieving operational teams from margin pressures.

These mechanisms can be designed with different **funding sources and accounting ledgers.** Subsidies can be allocated under COGS or through external budgets like carbon reduction funds designed to address decarbonization. While current mechanisms may not factor in legislative costs, eco-modulation fees are likely to become integral to transition financing systems in the coming years. Another design dimension is the **allocation approach.** Two models allocating this subsidy are emerging and both approaches assume that material premiums—and consequently subsidies—will decline over time with increased scale.

- The first is **decoupling premiums.** Some brands separate premiums at the fabric or yarn level, covering excess costs via separate invoices from suppliers, minimizing supply chain disruptions.
- The second is **subsidized materials.** Other brands provide "margin relief" tied to specific materials, enabling sourcing and marketing teams to procure higher-cost products with built-in financial support. This model requires tracking mechanisms and team education.

> **Strategic innovation, deep collaboration across the supply chain, and transition financing are vital to achieving our goals. Building on our centralized financing model for organic cotton, we are now exploring similar approaches to scale next-generation materials and establish a new competitive parity."**
> **Dorte Rye Olsen**, Head of Sustainability, Bestseller

Lever #2: Cost

Set material standards and strengthen partnerships across the value chain to enable scale. Standardized material specifications and strategic value chain partnerships are critical, interconnected levers for scaling next-gen materials. Standardization reduces inefficiencies and ensures consistent performance, while aligning with key supply chain partners secures reliable sourcing and scalability during early development. Together, these efforts accelerate adoption, drive economies of scale, and achieve cost parity faster, unlocking the transformative potential of next-gen materials for the industry.

Standardized fabric specifications provide a framework to align performance, quality, and cost expectations, ensuring consistency across material portfolios and simplifying integration into product lines. This allows for brands to begin with signature products where volumes are guaranteed, building critical demand and providing suppliers with predictable orders. This approach enables tier two, fabric and material suppliers to optimize production processes and improve efficiency. It also enables the cost curve to bend effectively. An example of this effort is Circulose and Circ focusing on a standardized blend of 30% MMCF in attempt to streamline, reduce complexity, and enable economies of scale on the tier one and tier two supplier level.

Strategic partnerships with selected suppliers are equally important for a smooth and effective next-gen transition, ensuring innovation is balanced with operational feasibility. Proactively engaging suppliers through clear discussions about rollout plans—such as volumes and timelines for increasing next-gen material content in blended solutions—builds confidence and fosters collaboration. This coordinated approach allows to pool volumes against the most committed suppliers, can unlock efficiencies, but also helps to minimize disruptions to production processes and quality standards. It also helps prevent cumulative supply chain markups, where small differences in material pricing compared to virgin materials can escalate into disproportionately high final costs. Such strategic partnerships are ideally also backed via upstream agreements between innovators and suppliers, as illustrated in the example of MAS Holdings' three-year offtake agreement with Ambercycle to purchase cycora® fiber.

> **Building strong relationships with our supply chain partners is crucial for achieving lasting and efficient sustainability progress. Our successful journey to convert nearly 100% of our polyester volume to recycled polyester (primarily from PET bottles) by 2024 demonstrates the power of such collaborations. This experience has also empowered us to pledge that by 2030, 10% of our total recycled polyester volume will transition from bottles to textile waste feedstock."**
> **Sigrid Buehrle,** Senior Vice President Sustainability and ESG, adidas

Joint R&D efforts with a select group of suppliers is equally important to validate and enhance performance, quality, and cost early on in the development phase. For instance, through the Full Circle Textile Project, Fashion for Good partners PVH Corp., Kering, and Target successfully advanced the development of next-gen recycled MMCFs by working closely with Birla Cellulose and innovators such as Circ, Circulose, and Infinited Fiber Company. These partnerships create a virtuous cycle: brands provide reliable demand signals and early support, while suppliers refine production processes and position themselves as critical enablers of next-gen material adoption.

> **Collaborating with brands to integrate next-generation solutions is key, as strong market demand drives joint development. This partnership approach enhances efficiency, innovation, and industry-wide impact, accelerating breakthrough solutions."**
> **H.K. Agarwal,** Managing Director, Grasim Industries Limited | Pulp and Fibre

Lever #3: Capital

Mobilize capital to scale next-gen innovation. Scaling next-gen materials requires active investment from brands to drive innovation and commercialization. Beyond providing demand signals, cost support, and R&D collaboration with innovators, brands often contribute in-kind resources such as expertise, infrastructure, and technical capabilities, often formalized in the shape of **joint development agreements.** Another critical role that brands can play is cementing the relationships between their strategic supplier and the material innovation by initiating supply chain investments, joint facility setups or regional support. Some brands go even further, accelerating the scaling journey through **direct equity investments,** which provide innovators with critical growth capital needed to scale production, refine operations, and achieve commercial viability.

These efforts often involve active engagement, such as **providing expertise and networks, taking board membership roles,** or, as several companies already do, establishing **corporate venture capital (CVC) funds** to systematically invest in aligned startups. Notable examples of brands investing strategically in a portfolio of next-gen material innovators include adidas, Bestseller, H&M, Inditex, Ralph Lauren, and Zalando. Inditex, the parent company of Zara, has led by example, deploying all the levers listed above. The company has defined a clear next-gen material roadmap, built a cross-functional innovation team, secured offtake agreements, and made strategic equity investments.

- Inditex anticipates that 25% of its fibers will be sourced from next-gen materials that have yet to reach industrial-scale production and is actively investing in their development.[15]
- Through its Sustainability Innovation Hub, Inditex has collaborated with over 350 startups and piloted 35+ innovations in materials and processing.
- Notable investments by Inditex include acquiring a stake in the lab-grown cotton pioneer Galy, funding textile recycling innovator Circ, and establishing a $52 million materials-focused innovation fund.[16]

For brands, these investments go beyond financial returns—they provide early access to next-gen materials, offering a competitive edge in integrating sustainable innovations into their product lines and allow them to influence the trajectory of innovations while fostering deep strategic partnerships.

15 Inditex, *New Sustainability Commitments,* Inditex website, 2023.

16 Jasmin Malik Chua, "Zara Owner Launches 50 Million-Euro Fund to Invest in Textile Innovation," *Sourcing Journal* website, October 14, 2024.

CHAPTER 4: WHAT BRANDS CAN DO COLLECTIVELY

Lever #1: Demand

Pool demand to achieve critical volumes at optimized costs. In the fragmented fashion industry, demand signals generated by individual brands are powerful, but their impact is often insufficient to drive the critical volumes required for economies of scale, particularly during scaling phases. Unlike consolidated sectors such as automotive, where a few players can drive substantial influence, fashion brands must collaborate to amplify their impact. **Aggregating demand** across multiple brands becomes essential to optimize production, reduce unit costs, and improve pricing. Coordinating efforts to nominate common suppliers further enhances efficiency, directing consolidated volumes to specific partners and enabling larger, more streamlined production runs across the value chain.

Circ's Fiber Club supported by Fashion for Good and Canopy, launched in Q4 2024, exemplifies this by aggregating brand orders during the precommercial phase, addressing the challenges of limited development volumes. The initiative pools demand to secure bulk pricing with 15–20% savings, eliminates minimum order quantities, and guarantees early and seamless access to Circ's recycled materials for brands requiring smaller quantities through a network of fiber producers and manufacturers, including yarn and fabric suppliers. The strategy not only creates supply chain efficiencies but also bridges the gap to market readiness, enabling innovators to scale effectively under competitive conditions.

> **"We view our support for the Fiber Club as vital to scale up next-gen materials and tackle the systemic challenges facing our industry. Such partnerships bring us closer to achieving a more circular future for fashion."**
> **Pascal Brun,** VP Sustainability and D&I, Zalando

Leverage collective transition financing mechanism. A collective transition-financing mechanism offers a potential solution to the financial hurdles of scaling next-gen materials; it envisions a financing vehicle, backed by industry and philanthropy or financiers, to temporarily offset the higher costs of next-gen materials during the transition phase. This mechanism aims to reduce pricing pressures on early adopters, bridging the cost gap and enabling wider adoption; by pooling resources and driving efficiencies across the value chain. For example, Fashion for Good, in collaboration with Canopy Planet and supported by Laudes Foundation, has developed the Next-Gen Transition Initiative (NGTI) that will be tested in 2025 with select innovators. (See "Collective Financing in Action: Next-Gen Transition Initiative.")

COLLECTIVE FINANCING IN ACTION: NEXT-GEN TRANSITION INITIATIVE

Fashion for Good and Canopy, in collaboration with Laudes Foundation and multiple brands and fiber producers, have developed Next-Gen Transition Initiative (NGTI) to tackle the transition costs of next-gen materials through a collective financing mechanism, supported by industry and philanthropy. Building on the learnings of the Better Cotton Initiative (BCI) and others, the model proposes the use of a transition funding at specific steps in the supply chain where added costs are most significant.

The NGTI functions as a centralized financing vehicle, with brands paying a retroactive volume-based fee based on the volume of next-gen materials purchased in a year. Such an approach avoids increasing upfront material costs and reduces the overall burden of costs on the brands and allows brand teams to operate business as usual with new materials available at price parity.

By addressing transition costs at critical stages, NGTI facilitates the adoption of next-gen materials. Through pooling demand across brands, innovation premiums are reduced by enabling higher production volumes and continuous manufacturing. This significantly lowers the additional costs associated with small-batch production. Integration premiums are addressed through targeted subsidies applied to key supply chain steps, such as fiber production, while aggregated demand for standardized products, such as contained fiber specification, allows producers to achieve economies of scale. Additionally, NGTI alleviates the premium price burden on downstream suppliers and brands by ensuring that no price premium is perpetuated or compounded within the supply chain (supply chain premium) after subsidies are applied. This cohesive approach minimizes cost barriers and creates favorable conditions for scaling next-gen materials effectively.

This results in ~30–40% premium cost saving for brands (vs original price premium of next-gen material without NGTI) and a 100% cost saving for sourcing teams.

Enable policy frameworks to incentivize uptake. Policies play a crucial role in the adoption of next-gen materials by creating demand, leveling the playing field, and addressing market barriers such as high costs and lack of infrastructure. Public-private cooperation can help shape effective policy frameworks in multiple ways:

- **Public-Private Collaboration:** engage with policymakers to share insights on market demand for next-gen materials and provide input on mechanisms such as tax incentives to support their adoption.
- **Pilot Projects and Case Studies:** demonstrate the viability of next-gen materials by providing policymakers with evidence that these materials are scalable and effective.
- **Participating in Policy Consultations:** contribute to policy discussions on regulatory standards and eco-modulation fees under EPR schemes in the context of the EU's Circular Economy Action Plan.

When brands collaborate, they provide policymakers with a more comprehensive understanding of market challenges, enabling the development of more effective policy solutions.

Lever #2: Cost

Coordinate sourcing to drive efficiencies and access to low-cost inputs. Supply chain partners are pivotal in realizing process and cost efficiencies to effectively bend the cost curve and brands can enable this collectively in multiple ways. **Standardized fabric specifications** (for example, a blend of 30% next-gen material/70% cotton) and **nominating suppliers to consolidate volume flows** reduces inefficiencies, streamlines processes, and unlocks economies of scale.

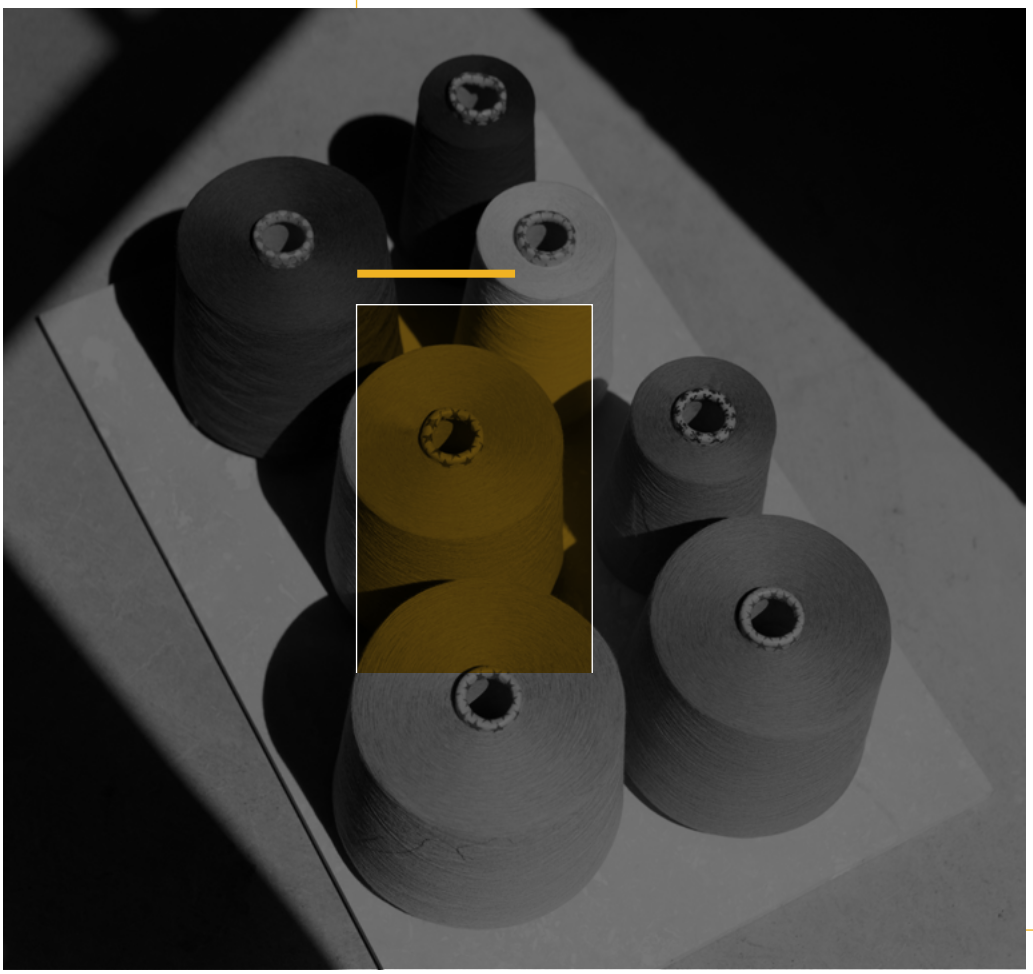
Additionally, brands can work collectively to enable access to **low-cost feedstock for recycled next-gen materials.** By directing and aggregating waste streams for recycled inputs, brands can ensure a consistent supply at competitive prices and transform post-industrial waste into a valuable resource for next-gen materials.

Initiatives like Fashion for Good's Sorting for Circularity India and GFA's Circular Fashion Partnership in Bangladesh illustrate this approach. Using the Reverse Resources platform, these programs consolidate postindustrial textile waste from shared supply chain facilities, increasing accessibility to high-quality recycled inputs and supporting the scalable production of next-gen materials.

> **"Our 2030 materials target is designed to drive widespread adoption and reduce barriers for the company by setting targets for next-gen materials, including materials which are third-party preferred or certified. We're also working collectively with other brands to further drive demand and cost levers to bend the adoption curve. We do this because we know that high quality and durable materials are core to our brand and the future of our industry."**
>
> **Jeffrey Hogue,** Chief Sustainability Officer, Levi Strauss & Co.

Lever #3: Capital

Form targeted consortia to fund next-gen solutions. Forming equity investment consortia allows stakeholders to pool resources and collectively invest in next-gen material innovators. These consortia bring together relevant scaling actors such as brands, suppliers, and institutional investors to **share the financial risk** associated with early to mid-stage ventures. For instance, Infinited Fiber Company completed a $42 million two-part development financing round with investment from a range of stakeholders including fashion retailer Inditex, and Fast Retailing (via TTY Management), manufacturers Youngone and Goldwin, joining the existing investors adidas, H&M, and Zalando.[17] By diversifying exposure, **individual risk is reduced** while providing innovators with critical funding to scale operations and develop infrastructure. When industry players actively participate in these consortia, they send a **strong signal** to the financial market, demonstrating a commitment to next-gen materials. This, in turn, can unlock additional investments from institutional players, development banks, and public funds, further amplifying the impact of collective efforts.[18]



17 Infinited Fiber Company, "Infinited Fiber Company Successfully Completes EUR 40 Million Development Financing Round," Infinited Fiber Company website, March 8, 2024.

18 For the role of brands in unlocking project finance, please see Fashion for Good and Spring Lane Capital, *The Great Unlock: Closing the Innovation Commercialisation Gap Through Project Finance Solutions*, Fashion for Good website, 2023.

CHAPTER 5: CONCLUSION

Next-gen materials offer the fashion industry a transformative opportunity to address pressing challenges while unlocking new pathways for sustainable and resilient growth. However, with demand for these materials projected to outstrip supply by 2030, the need for bold, coordinated industry action has never been more urgent. Without this, access to next-gen materials will remain limited and concentrated among a select few, leaving most brands struggling to adapt in a fast-evolving landscape.

Scaling next-gen materials requires a unified, strategic approach focused on three critical levers: demand, cost, and capital. By bending the cost curve, the industry can unlock broader market access to next-gen materials and create a pathway to a sustainable and competitive future.

The pace of change must accelerate, and brands are pivotal to this transformation. Individual action enables brands to drive next-gen material strategies that align with their business goals, securing a competitive edge. Simultaneously, collective action amplifies impact—pooling demand, harmonizing sourcing strategies, and consolidating resources to mitigate risks and achieve economies of scale.

The time to act is now. The next-gen materials revolution is more than a challenge—it's an unprecedented opportunity to lead. Brands that adopt next-gen materials today will not only unlock financial benefits and drive long-term value but also position themselves as leaders in an evolving landscape. Together, we can weave a legacy of innovation, sustainability, and resilience to inspire generations to come.

ABOUT THE AUTHORS

KATRIN LEY
Managing Director,
Fashion for Good
katrin.ley@fashionforgood.com

PRIYANKA KHANNA
Innovation Director - Scaling,
Fashion for Good
priyanka.khanna@fashionforgood.com

GEORGIA PARKER
Innovation Director - Validation,
Fashion for Good
georgia.parker@fashionforgood.com

CATHARINA MARTINEZ-PARDO
Managing Director & Partner,
BCG
martinezpardo.catharina@bcg.com

MARC SCHELENZ
Managing Director & Partner,
BCG
schelenz.marc@bcg.com

TOM LANGE
Principal,
BCG
lange.tom@bcg.com

ELIAN EVANS
Senior Analyst, BCG
evans.elian@bcg.com

ACKNOWLEDGMENTS

The authors are grateful for the insights and assistance provided by our colleagues to make this report possible. Our many thanks to Sebastian Boger, Asli Kurbay, Beatrice Lemucchi, Ioulia Chafrai, Sena Velioglu, and Virginia Goffredi from the BCG team and Hollie Stringer and Carolina Duarte from the Fashion for Good team.

APPENDIX: **GLOSSARY**

T2T (Textile-to-Textile) chemical recycling PET: Chemical recycling is a generic term that includes several recycling processes (solvent processing, depolymerization, gasification). Depending on recycling processes, energy consumption, yield and output vary broadly; reaction outputs are syngas, monomers, polymers. The recycling process produces substances that can be used as raw material to manufacture new material. PET chemical recycling uses PET rich textile feedstock and one of the following processes: glycolysis, hydrolysis, or methanolysis to break the polyester down to the monomer level. Each of these processes produces a different monomer output which will then require repolymerization to PET.

T2T chemical recycling PA: Chemical recycling is a generic term that includes several recycling processes (solvent processing, depolymerization, gasification). Depending on recycling processes, energy consumption, yield and output vary broadly; reaction outputs are syngas, monomers, and polymers. The recycling process produces substances that can be used as raw material to manufacture new material. Nylon recycling processes nylon-rich textile waste through chemical recycling, breaking it down into monomers which are then repolymerized to create new polyamides (nylon).

T2T chemical recycling MMCF: The chemical recycling process produces substances that can be used as raw material to manufacture new material. Cellulosic chemical recycling uses cellulose rich (for example, cotton) textile waste feedstock through solvent processing to create a manmade cellulosic pulp/fiber.

Alternative processing MMCF: Alternatives to MMCF processing with hypothesised reduced impact (for example, fewer chemicals) when compared to conventional viscose or other MMCF processes. Examples include utilization of ionic liquids as a solvent or mechnophysical techniques.

Alternative feedstock MMCF: Utilization of alternative feedstocks (nontextile waste) to produce pulp for MMCF production. Examples include agri-residue and bacterial cellulose.

Integrated recycling: Recycling processes that combine mechanical and chemical methods used to process cotton and polyester textile waste.

Cottonized bast fibers: Fibers derived from the outer cell layers of the stems of various plants, both cultivated for use in textiles and agri-residue fibers. These fibers undergo cottonization processing to shorten bast fiber length and remove lignin and other components to allow for spinning on cotton machinery and improved handfeel and aesthetic properties. These cottonization processes can be mechanical, chemical, enzymatic or other, or used in combination.

Biosynthetics: Biosynthetics are synthetic polymer materials comprised, in whole or in part by bio-derived compounds. These compounds can either be made with an input of biological origin (biomass), and/or where the process is performed by a living microorganism. For bio-based PET, either the ethylene glycol or terephthalic acid are made from bio feedstocks. Other biosynthetic polymers include PHA, PLA, and PBS.

Bio feedstocks: Bio feedstocks are feedstocks derived from biological origin. Feedstocks commonly used include corn, sugarcane, sugarbeets and in the future could also include agri-residues, methane gas and captured carbon emissions.

Biofabricated proteins: Man-made fibers produced from protein polymers which are biofabricated by genetically modified microbes fed on nutrients (sugar feedstock). The polymer is extracted, purified, dried and then the protein polymer solution is spun into fibers.

Regenerated proteins: Man-made fibers produced from either animal or vegetable nonfibrous proteins which have been reconfigured to take up a fibrous form. The process requires the isolation of the polymer from the source material for solubilization so that it can be extruded or spun.

Postindustrial textile waste: Any waste that gets generated as a by-product of industrial processes such as milling, spinning, printing and garmenting. This waste is a subset of the preconsumer waste.

Preconsumer textile waste: Preconsumer waste includes all postindustrial waste as well as any leftover/unsold materials or products such as fabric ends, unsold garments, so on.

Postconsumer textile waste: Textiles that have been disposed of after consumption and use by the citizen or end-users of commercial or industrial institutions, processed by a specialized textile sorter.

SCALING NEXT-GEN MATERIALS IN FASHION

AN EXECUTIVE GUIDE