

Sustainable Raw Materials Will Drive Profitability for Fashion and Apparel Brands

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Textile Exchange is a global non-profit driving beneficial impacts on climate and nature across the fashion, apparel, and textile industry. It guides a growing community of brands, manufacturers, and farmers towards more purposeful production from the very start of the supply chain.

Its goal is to help the industry to achieve a 45% reduction in the emissions that come from producing fibers and raw materials by 2030. To get there, it is keeping its focus holistic and interconnected, accelerating the adoption of practices that improve the state of our water, soil health, and biodiversity too.

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At Textile Exchange, materials matter. To learn more, visit textileexchange.org.

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Sustainable Raw Materials Will Drive Profitability for Fashion and Apparel Brands

Raw materials *make* fashion and apparel brands. And can break them, especially as the world confronts climate and sustainability challenges and especially because raw materials can constitute as much as two-thirds of a brand's climate impact.¹ The industry must urgently accelerate its efforts to reduce its greenhouse gas (GHG) emissions by 45% by 2030.

Getting raw materials right, from a sustainability perspective, can support regulatory compliance—and lead brands to a new source of profitability. Failing to do so can leave them at a competitive disadvantage, especially given that a product's final cost is largely determined by its raw materials.

From orange haze in New York to flooding in Pakistan and record-breaking heat waves around the Mediterranean, the effects of the climate emergency are devastating communities—and supply chains—globally. The fashion and apparel industry has a pivotal role to play in meeting global climate and GHG emission reduction targets, and the industry's impact has not escaped the attention of key stakeholders, including consumers, investors, and legislators.

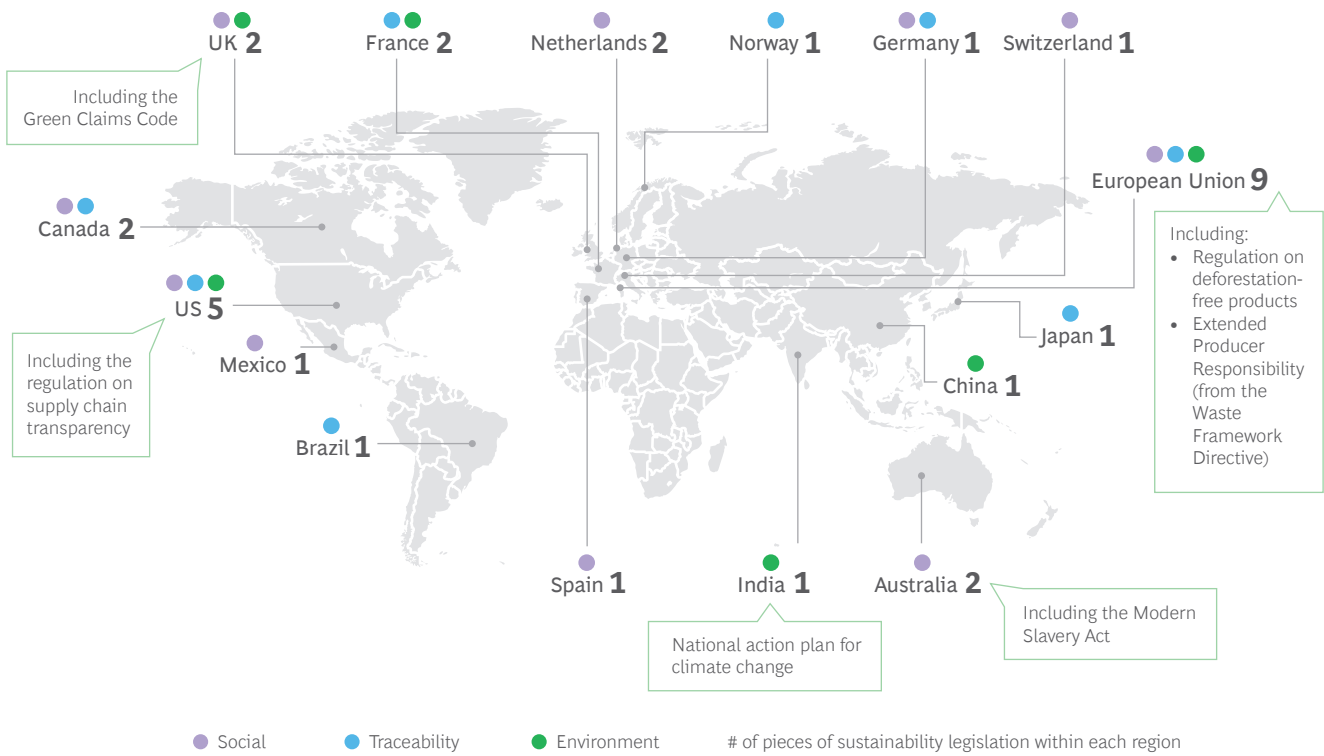
Never before has the industry found itself the target of such intensifying regulation focused on the environmental impact of products and their materials. On the basis of BCG's conversations with experts, we believe that over the next two to four years—a time frame that we can conceptualize as just four cotton harvests or eight fashion weeks away—more than 35 new pieces of sustainability-linked regulation are expected to go into effect around the world, targeting import restrictions, product design guidelines, labeling requirements, and more. (See Exhibit 1 and the sidebar “About This Report.”)

Fashion and apparel brands must prepare to meet these upcoming regulations. The need is urgent, and the industry knows it: more than 85% of leading brands (by sales) have publicly declared decarbonization targets for their supply chains.² To deliver, they need a strong raw-materials strategy. In formulating that strategy, one key—and thorny—question is, Where do we place our bets when selecting the right raw materials, especially given that supply is often precarious and will remain so? (See the sidebar “Demystifying ‘Sustainable’ and ‘Preferred’ Raw Materials.”)

Brands therefore face a broad two-part challenge: they must double down on driving carbon reduction while preparing for upcoming regulations. Success on both counts relies on a robust strategy for preferred raw materials—one that helps brands lock in a supply of sustainable materials for the future. Putting that strategy in place now—and putting it into immediate action—promises to pay off. Brands that act now to secure a preferred-raw-materials supply for the future will be positioned to capture an estimated average 6% profit uplift after five years. In fact, at the high end of the range in our model, a fashion brand with \$1 billion in annual revenues has the potential to tap a cumulative opportunity of approximately \$100 million over five years.

1. Quantis analysis based on expert insights, covering impacts from Tier 4 to Tier 2 within the corporate carbon footprints of fashion and apparel brands.
2. BCG analysis based on 36 fashion and apparel organizations, including brands and parent organizations, representing more than 10% of the industry's revenues.

Exhibit 1 - Fashion and Apparel Brands Will Contend with More Than 35 Pieces of Significant New Legislation in the Next Two to Four Years



Source: BCG Research.

About This Report

This publication is a joint initiative of Boston Consulting Group (BCG); Textile Exchange, a global nonprofit driving positive impact on fashion’s climate change; and Quantis, BCG’s sustainability-focused consultancy. This publication offers a perspective on the challenges and opportunities for fashion and apparel brands as they transition to low-climate-impact raw materials to enable compliance with upcoming regulations and to meet Scope 3 climate targets.

Our assessment focuses on the top five raw materials, which together account for the largest GHG footprint in the industry: cotton, wool, bovine leather, manmade cellulosic fibers (MMCFs), and synthetic materials.

To provide an informed analysis, we conducted interviews with industry experts, gathered data and insights, developed business models, and created a Materials Manifesto comprising six principles to guide brands in future-proofing their materials strategy.

This report provides a valuable resource for fashion and apparel brands seeking to establish robust strategies in relation to raw materials in a fast-evolving context.

Demystifying “Sustainable” and “Preferred” Raw Materials

What are “sustainable” or “preferred” raw materials?

The reality is, there are no absolute definitions at the moment. Even the material with the lowest environmental and social impact could have unintended tradeoffs or could put significant pressure on the planet if overused.

In September 2023, Textile Exchange updated its holistic definition of preferred raw materials and fibers: those that “deliver consistently reduced impacts and increased benefits for climate, nature, and people against the conventional equivalent, through a holistic approach to transforming production systems.” (See Textile Exchange, “Preferred Fibers and Materials: Definitions,” 2023, p. 7.)

While the wider nature and people considerations are absolutely critical to the positive impact the fashion and apparel industry can have, this publication focuses on reducing climate impact within the industry; thus, in this document the term *preferred materials* refers to materials with reduced climate impacts.

There are two primary pathways toward GHG impact reductions in relation to raw materials:

- Using sustainably sourced recycled raw materials (this goes for all nonrenewable materials but is also an increasingly important pathway for renewable raw materials)
- Using sustainably sourced renewable raw materials that are continually replenished at a rate equal to or greater than the rate of depletion.

To enable a truly circular system and mitigate the risk of sourcing raw-materials inputs from outside the industry, sustainably sourced recycled materials should prioritize materials from textile waste, rather than from diverting waste from other industries with their own robust collection and recycling systems (such as plastic bottles).

Credible third-party-certified materials can support brands in their preferred-raw-materials strategies, in terms of both impact and traceability. Although access to GHG reduction impact data associated with these materials has often been limited in the past (partly because standards have traditionally been practice-based, rather than outcome-based), some certified solutions, including recycled and organic, have available impact reduction data. Recent efforts are beginning to further close the gap on the industry’s understanding of impact data related to standards and certifications; for example, Better Cotton released its first study of GHG emissions in 2021, and Textile Exchange is evolving its standards to more directly link practices to outcomes along with conducting new life cycle assessment studies on several of its existing standards.

Energy use within the many textile-manufacturing processes and facilities is another consideration from a GHG perspective. Obviously, renewable energy is preferable and the elimination of coal-fired power and other fossil-fuel-powered sources is an immediate concern, with action to be taken across the industry.



Pending Regulations Will Influence Operations

The pending regulations have greater depth and breadth than the fashion and apparel industry has seen before, and it is anticipated that brands may struggle with what is to come. A BCG review of brands in the luxury industry found that currently just 15% comply with all the guidelines of a flagship sustainability-linked regulation (the 2015 UK Modern Slavery Act).³

Such performance has signaled to policymakers that certain industries, including fashion and apparel, are making limited progress in the transition toward a sustainable future. Consequently, policymakers have carved out an active role for themselves by setting clear directives for the industry on defining the future from a sustainability perspective. Given the ever-evolving nature of the science and data that inform these regulations, as well as ongoing global issues such as war, inflation, and economic uncertainty, these regulations are not perfect. However, industry leaders welcome the full ecosystem transformation that these directives demand. Many brands are looking to regulation as a way to ensure a level playing field across brands and to collectively raise the bar for all actors in the market, without disrupting competition.

3. BCG analysis conducted on 76 brands across luxury sectors (including fashion) to assess the adherence to the UK Government Modern Slavery Statement guidelines (taken as a representative sample for the worldwide industry).

The Multiple Impacts on Operations

Upcoming regulations will cover every aspect of the operations of manufacturers, brands, and retailers in the fashion and apparel space. All life cycle stages of the product will be regulated:

- The way products are sourced (for example, to exclude human rights challenges)
- The way they are designed (for instance, the EU’s Ecodesign for Sustainable Products Regulation)
- The way they are marketed (for example, the EU’s Green Claims Directive)
- The way they are discarded (for example, the EU’s Waste Framework Directive and the Extended Producer Responsibility)

Operationally, this will require organizations to know their impact, disclose a reduction plan (such as the one outlined by the EU’s Corporate Sustainability Reporting Directive), inform consumers about the environmental performance of the product they are buying (as described in the French Climate Law), and take all necessary measures to improve their environmental and social performance (see the EU Corporate Sustainability Due Diligence Directive).

This will lead to a significant change in many industry players’ value chain operations, data flows, and IT systems.

Within the automotive industry, the advent of sustainability-related regulations engendered rapid change similar to what the fashion and luxury industry might expect. “Regulation has been a catalyst for circularity in the electric vehicle battery space and is challenging the traditional understanding of business as usual,” noted BCG’s Johanna Puetz, who works in the industrial goods and climate and environment fields. “Currently, the ratio of recycled materials used in electric vehicle batteries is effectively 0%, and by regulation it needs to reach more than 10% for many materials within ten years. There is high competition—leading to high cost—for materials and technologies as automotive brands scramble to innovate, set up, and industrialize closed-loop recycling systems.”

For fashion and apparel brands, BCG predicts that regulations will most immediately target fiber-to-fiber recycling and the lowest-carbon-impact raw materials.

Any regulatory infraction has the potential to harm a brand’s bottom line and, crucially, could tarnish a brand’s reputation. In some instances, brands may face lawsuits or significant fines. Said Baptiste Carriere-Pradal, a cofounder of 2BPolicy, a consultancy on EU policies, “The latest German regulation—due diligence as part of the Supply Chain Act—has changed the rules of the game by increasing the magnitude of penalties and setting the blueprint for even granular violations to be reviewed publicly and for brands to be held to account.”

Worse, products may be denied entry to markets until brands can satisfy new requirements and labeling laws. This amounts to an overall maximum risk exposure of 8% of EBIT.⁴ Potentially losing earnings of this magnitude poses a threat to the business model of any brand (especially those that rely on wholesale channels).

Investor and Consumer Perspectives

Across the board, investors and consumers are welcoming the regulatory changes. To guide their decisions, whether about investing in brands or purchasing products, they are watching how brands react.

Investors expect brands to demonstrate a strong risk mitigation strategy and a flexible approach to cater to upcoming regulatory requirements. “Even before considering consumer sensitivities, investors are becoming increasingly stringent in the face of tighter legislation and regulation. They are paying very close attention to how a brand orients itself around its environmental footprint,” said Luca Solca, a senior analyst at Bernstein.

For consumers, who may have been perplexed by a myriad of sustainability claims in the past, clearer guidance should make purchasing decisions much easier, particularly given that several pieces of regulation relate directly to the products and materials within a brand’s portfolio. Under the EU’s Green Claims Directive, for example, brands will need to disclose the environmental performance and recycled content of their products.

Furthermore, although emerging regulations can be complex and even conflicting, policy experts agree that traceability will be a key delivery and compliance mechanism for all or most of these regulations. The origin of raw materials will become a key data point to track and manage given that most regulations will demand unprecedented levels of information about where and how products are made. For example, the French Climate Law obliges brands to show the “eco-performance” of all products. Consequently, by 2026, consumers on Parisian wholesale floors will be able to compare brands and products on the basis of a consistent methodology.

4. BCG analysis, for an average-size fashion brand in the EU.



New and emerging regulations will help standardize messaging to consumers about products' sustainability credentials, potentially allowing consumers to compare brand to brand at the point of purchase.

Indeed, brands must ready themselves for a level of scrutiny not seen before given the increased empowerment of consumers in tandem with the steady increase in consumers' appetite for sustainability. In 2023, 65% of surveyed consumers said that sustainability influenced their purchasing habits (an increase of 4 percentage points since 2019); the percentage was even higher among Gen-Zers.

Federica Licini, the head of sustainable business at the online fashion retail platform Farfetch, can attest to consumers' intensifying interest in sustainability. "Farfetch customers continue to intentionally engage with and ultimately purchase sustainable products, a trend that is reflected in the consistent growth of sales over time. Not only is this customer cohort expanding, but also the spectrum of consumers is broadening to include both early adopters of and newcomers to sustainable consumption."

Honing In on Lower-Impact Materials

To set themselves up to effectively respond to the coming regulations and to develop a competitive edge, brands must embed sustainability considerations and requirements across their businesses—into design, procurement, manufacturing, labeling, marketing, business models, and financial plans.

From a materials perspective, beyond compliance and risk mitigation, brands must think carefully about their product and materials approach, including paying closer attention to traceability and labeling. The regulatory push for the use of lower-impact materials will increase demand for these materials and, hence, potentially put pressure on growers and farmers to accelerate at the same rate. Therefore, securing supply is of the utmost importance for brands.

But navigating the landscape of preferred materials can be complex given an abundance of claims from suppliers (with varying levels of robustness and impact measurement and delivery), lack of data regarding how specific materials link to the delivery of science-based targets (critical measures that we will discuss in more detail later), and the widespread lack of connectivity between raw-materials suppliers and brands, which often leaves fiber origins unknown. Furthermore, although regulators are beginning to develop approaches to enable consumers' understanding of the climate impacts of materials, the nuances involved in trying to define what makes a material "preferred" can leave brands in the lurch.

Even if a brand has sincere intentions and is willing to invest and make operational changes, the solutions to these challenges may continue to elude them. But there are ways to close in on solutions, beginning with addressing the "materials gap."



The Rising Materials Gap

In recent years, brands have been making pledges and setting targets aimed at reducing their climate impact, targeting GHG emissions.

In this respect, the fashion and apparel industry is one of the most advanced. Approximately 400 brands have committed to set or have approved science-based targets through the Science-Based Targets initiative (SBTi)—the highest representation of any industry, according to the Apparel Impact Institute.

Then, moving beyond “carbon tunnel vision” (the tendency to focus only on CO₂), brands have begun broadening their pledges to reduce their nature and social impacts by including factors such as worker well-being, animal welfare, and impacts to freshwater and land.

Given the increasing number of impact goals (particularly related to climate) that focus on raw materials, it’s obvious

that the demand for lower-impact materials is increasing in tandem.

The Strain on Preferred Raw Materials

To hit shared global targets related to raw materials and fibers, such as reducing GHG emissions by 45% by 2030, and to comply with upcoming regulations, brands and retailers will need to convert the majority—if not the entirety—of their raw materials to preferred sources.⁵ However, Tier 4 suppliers have yet to receive a strong enough signal that brands will commit to and invest in these materials. Thus, raw-materials producers, farmers, and growers currently don’t have an incentive to take on the risks associated with increasing the supply of preferred raw materials, especially when their livelihoods are at stake. Consequently, the supply of preferred raw materials constituted only about 19% of total global production in 2021.⁶

Based on modeling from Textile Exchange and BCG, the preferred-raw-materials demand-and-supply gap will rise to as much as 133 million tons in 2030. (See Exhibit 2.) This can be conceptualized as more than six times the Indian production of the same materials in 2021.⁷

What Drives the Materials Gap?

In part, it's the lack of a united front within the industry to achieve scaled financial investment and clear market demand. This makes it impossible to unlock economies of scale. Farmers, growers, and innovators are dependent on new ways of working that result in industry-wide accountability and require financial investments, securities, and incentives to provide stability for businesses, livelihoods, and communities.

This situation is not helped by the current global economic slowdown, the resetting of climate targets, and the lack of incentives for raw-materials producers. One raw-material producer told us, "It is increasingly common to find brands renegeing on sourcing commitments, cutting orders, changing their sourcing strategies, or retracting their commitments as a result of challenged margins, limited budgets, and an ever-changing market." These scenarios leave raw-materials producers in the lurch in already troubled economic times; it's no surprise that they might be inclined to decrease their (often more resource-intensive) production of preferred raw materials to sidestep losses.

Additionally, climate-change-related supply issues (such as flooding in Pakistan and India and drought in the US) leave producers with resource constraints and degraded land, hindering their ability to grow and provide raw materials in line with the rapid scaling of economies that is needed to close the materials gap.

Closing the Gap

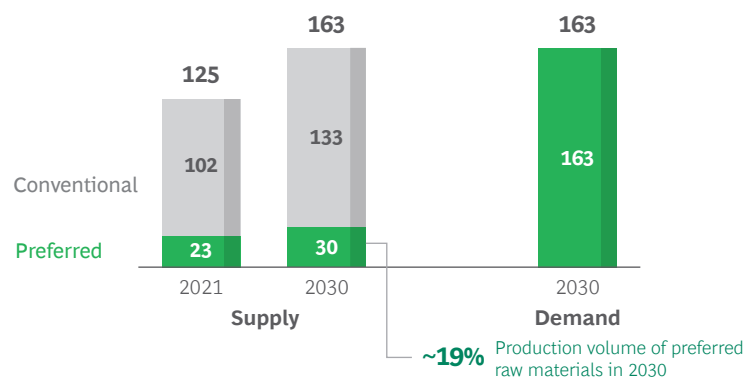
The solution is to invest in the supply of preferred raw materials now, thereby securing resources and future-proofing brands' business models. This will be essential to accelerating the sustainability transition and ensuring that brands will realize their 2030 climate targets and other goals.

Exhibit 2 - Without Investment and Focus, the Preferred-Raw-Materials Gap Could Reach Some 133 Million Tons in 2030

Key Assumptions

- The annual growth rate for the conventional- and preferred-raw-materials supply is 3%.
- All brands and retailers have set ambitions of 100% preferred materials for 2030 (based on our analysis of the top brands).
- The scale of preferred-raw-materials programs will remain largely unchanged.
- The % of preferred-raw-materials production vs. total materials production will remain largely the same.

Projected supply and demand of global textile materials across all sectors (millions of tons)



Sources: Textile Exchange and BCG analysis.

Note: See Textile Exchange, "Preferred Fiber & Materials Market Report," October 2022, for more information. The exhibit shows the global production (all sectors) of leather, plant fibers, animal fibers, manmade cellulosic fibers, and synthetic fibers. It does not differentiate between their usages (that is, it covers apparel, home, and footwear uses). Recycled leather and alternative leathers are not included.

5. Textile Exchange, "Material Pathways: Accelerating action towards Climate+ goals," 2023, p. 3.
6. Textile Exchange data based on 2021 production volume of global fibers and leather.
7. BCG analysis, where data is publicly available.



How to Capture the \$100 Million Opportunity

For the last century, the fashion and apparel industry has been primarily focused on driving down the cost of raw materials. This objective has often come at the expense of the most vulnerable people, their livelihoods, and the planet.

The world is now at a turning point. The underlying resource and regulatory parameters that have shaped the industry's thinking over the last hundred years are transforming. Potential losses loom:

- Upcoming regulations could put 8% of EBIT at risk for brands that do not comply by adjusting their materials portfolio mix.⁸

- Changing ecosystems (involving, for example, extreme weather), as a result of climate change, are jeopardizing the availability, accessibility, and price of raw materials.
- The industry faces increased competition from the food sector, which also has land use needs as it seeks fertile ground for growing crops.⁹

Brands' business models must adapt and transform accordingly, not only to avoid the cost of inaction but also to proactively build security and resilience within supply chains.

8. BCG analysis, for an average-size fashion brand in the EU.

9. Economic Research Service, "Cotton Sector at a Glance," [website] (2022), accessed September 19, 2023.

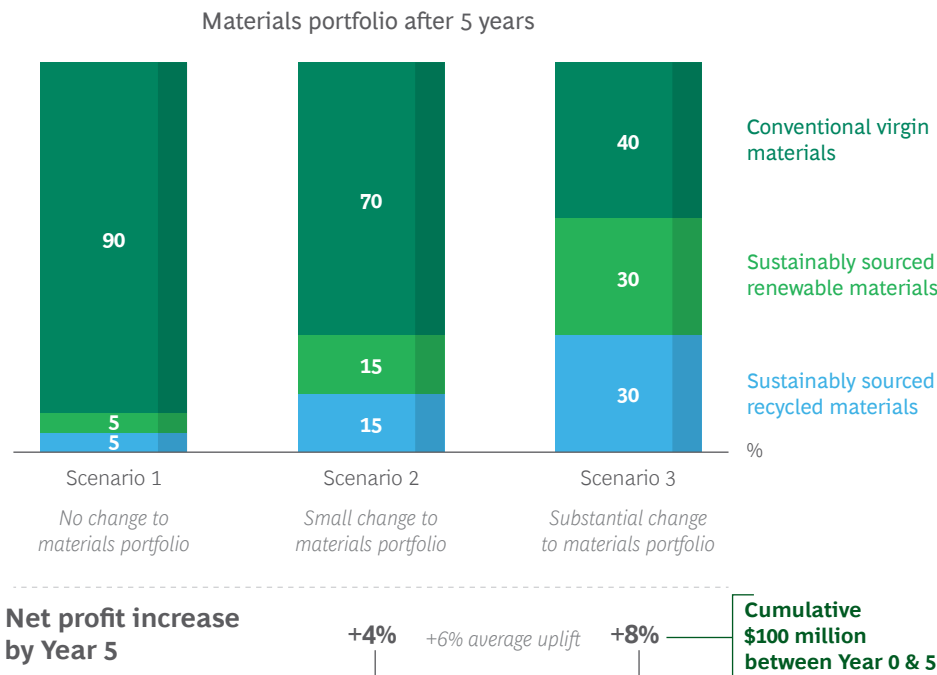
Brands that act today by setting clear procurement targets with respect to their raw materials and by significantly increasing the share of preferred raw materials in their portfolio stand to capture a significant upside. BCG forecasts that a midsize, high-street fashion brand with annual revenues of approximately \$1 billion can realize a net profit of approximately \$100 million over a five-year period by investing more significantly in preferred materials. On average, by Year 5 this would result in a net profit uplift of 6%. (See Exhibit 3 and the appendix for more information.)

This is Scenario 3 in our model, and it is based on reducing the share of conventional virgin materials (including virgin synthetics; conventional cotton, wool, and leathers; and noncertified MMCs) in the materials portfolio from 90% to 40%. The remaining portfolio share of 60% will be taken up by sustainably sourced renewable and recycled materials, which may account for lower fees under certain regulations. Thus, brands might find that tapping the \$100 million opportunity also means initiating a virtuous circle in which they are able to generate even greater savings and revenues.

This opportunity is the outcome of three drivers:

- **Annual Growth.** The brand in Scenario 1 has a slower annual growth rate owing to increased pressure on sales and product availability as a consequence of regulatory noncompliance (for example, products might be banned from entering markets) or lack of raw materials availability. In contrast, the brands in Scenarios 2 and 3 have invested to implement sustainability measures and have therefore secured access to core raw materials and will continue to grow, per industry standards, at approximately 2% per year, according to data from Euromonitor.
- **Preferred-Raw-Materials Prices.** The increasing demand for preferred raw materials is expected to affect the prices of those materials, especially if access and prices have not been locked in previously. The brand in Scenario 3 is able to guarantee preferred raw materials at the same price as conventional virgin materials or at a discount given its early, strategic commitment and agreements.

Exhibit 3 - Substantially Reducing the Use of Conventional Raw Materials Presents a Net Profit Opportunity of Approximately \$100 Million



Substantial changes to the materials portfolio (Scenario 3) can potentially unlock a cumulative \$100 million opportunity by year 5—with a 4%–8%, or an average 6%, net profit increase in that year.

Assumptions:

- Considers only the cost implications of improving a brand’s materials portfolio by heavily decreasing the share of conventional virgin materials
- Does not account for significant regulatory penalties, climate-change risk to land-based materials, and consumer behavior change in the face of more transparent sustainability claims

Source: BCG analysis.

Note: Based on a sample fashion brand, which is a midsize, high-street brand with annual revenues of approximately \$1 billion.

- **Annual Regulatory Costs.** Regulations such as the Extended Producer Responsibility (EPR), for example, will impose a fee on fashion brands; that fee can be reduced by investing more in sustainability. Scenarios 1 and 2 have higher regulatory annual costs related to noncompliance and limited investment in measures that would help reduce the fees to be paid. The brand in Scenario 3 would face reduced fees given its compliance with regulations.

These scenarios do not account for:

- The potentially significant regulatory penalties of inaction, such as lawsuits
- The risk that climate change poses to the production, availability, and quality of land-based materials
- Greater consumer uptake in the face of more transparent sustainability claims

Indeed, consumer behavior change is likely to be a boon for companies that make the move to preferred raw materials. “Across our markets, our customers consistently tell us they want to shop more sustainably but need guidance,” explained Christian Tønnesen, the group sustainability director at Selfridges Group. “We are responding to a customer need with our materials strategy. This covers our key materials such as leather and cotton, identified by volume and impact. By the end of 2025, any of the materials in scope must come from third-party-certified, more sustainable sources. Looking to 2030, we will expand this list to include additional materials.”

Even in a less ambitious scenario, in which the share of conventional virgin materials in the materials portfolio is reduced by 20% and replaced with preferred materials, an opportunity of some \$50 million is available, or a net profit uplift of 4% by Year 5.

When brands are focused only on reducing costs related to raw materials, they leave innovators, farmers, and growers unable to provide the necessary supply of preferred materials; consequently, brands face the materials gap and can’t adapt to the new regulatory landscape. And, inevitably, brands and the industry at large will significantly miss their climate targets.

This materials “catch-22” results in lower margins and revenue. Successful brands will abandon traditional cost-cutting approaches and sourcing strategies in favor of a new, equitable balance. Paying for preferred materials now means getting ahead of the curve and securing supply for the long term. This will reduce the risk of not having access when it is really needed. Further, it will benefit the livelihoods of the most vulnerable people in the value chain.



Navigating the Raw-Materials Landscape

Sourcing preferred raw materials requires reimagining high-volume materials. “Brands need to make sure they address the core raw materials that speak to their DNA; this will be meaningful for their consumers and investors,” noted Luca Solca, the Bernstein senior analyst.

The top five materials that are used—and that contribute to the largest GHG footprint in fashion and apparel—are cotton, wool, bovine leather, MMCFs (such as viscose), and synthetics (led by polyester and nylon).¹⁰ These can be categorized according to their origin and production processes, revealing similarities in their carbon impacts. (See Exhibit 4.)






Figuring Out Your Raw-Materials Impact

GHG impact assessments for materials can be difficult, given variability across sourcing regions, the frequent lack of data availability, and the lack of fully aligned impact measurement methodologies. Major efforts to improve and standardize these variables are underway, but in the meantime, brands should not hesitate to move away from using conventional virgin materials and toward existing preferred solutions.

Broadly, the options lie within two categories: sustainably sourced renewable materials (such as regenerative or organic materials) and recycled materials.

10. Textile Exchange, “Material Pathways: Accelerating action towards Climate+ goals,” 2023, p. 4.

Exhibit 4 - The Climate Impacts of the Top Five Materials Used in the Industry Derive from Their Origins and Production Processes

	Cotton	Wool	Bovine leather	Manmade cellulosic fibers	Synthetics
					
Possible origins	Cultivated from farms, fields, and pastures Rely heavily on agricultural practices, which can vary widely			Biobased wood-derived	Biobased plant-derived
	Pre- and postconsumer (textile) waste as a feedstock origin				
Production process	Production processes and manufacturing can heavily depend on chemicals Energy sources in production processes and manufacturing can be either renewable or based on fossil fuels				

Sources: Textile Exchange; Quantis; BCG.

Within materials categories, significant variability in GHG impacts exists—for example because of farming methods (such as grazing practices used in relation to bovine leather or agricultural practices like organic farming for cotton), among other factors. Regeneratively grown materials—that is, materials that are grown in harmony with natural systems and that focus on beneficial environmental, animal welfare, and social outcomes¹¹—are not a homogenous family of materials but a category that encapsulates multiple of scenarios.

The durability and quality of the material and product are also important, and this consideration should be taken into account beginning at the design and development stage. Doing so has practical implications for brands given that the intrinsic characteristics of conventional virgin materials are sometimes lost in recycled materials, creating weaker substitutes. For instance, 100% recycled cotton is not necessarily a direct substitute for virgin cotton and may require blending with virgin cotton to achieve the appropriate durability properties.

To understand and navigate this complex landscape, brands must carefully consider variations and challenges on a case-by-case basis to make informed choices that align with their targets and combat the climate crisis.

One tool that can support brands as they make decisions about which lower-impact materials to select is the Preferred Fiber and Materials Matrix (PFMM), an interactive tool originally created by Gap and now further developed and published by Textile Exchange. The PFMM aims to create a standardized assessment of the impacts of materials across multiple dimensions and serve as a way to inform and guide materials-sourcing decisions.

The tool, an updated version of which was launched publicly in September 2023, covers the following impact areas: climate, water, chemistry, land use, biodiversity, resource use and waste, human rights, and animal welfare. (See Exhibit 5 for an example based on one of the top five raw material types, cotton. Note that animal welfare is not included for the cotton assessment because it is not relevant to this material.)

As the exhibit shows, the PFMM assesses certified cotton options against various parameters. The climate column within the PFMM, for example, includes criteria such as the management of GHG emissions, climate resilience actions, and the protection of ecosystems to capture and store carbon.

11. Textile Exchange, “Regenerative Agriculture Landscape Analysis,” 2022, p. 16.

Exhibit 5 - Impact Data from the Preferred Fiber and Materials Matrix: Focusing on Cotton

Cotton

Cotton options (nonexhaustive; other cotton options remain under review)	 Climate	 Water	 Chemistry	 Land Use	 Biodiversity	 Resource Use & Waste	 Human Rights
Better cotton							
Cotton made in Africa (operates in Africa only)							
Fairtrade cotton							
EU Organic cotton, Fairtrade cotton, GOTS							
EU Organic cotton, GOTS							
EU Organic cotton, OCS							
MyBMP (operates in Australia only)							
Recycled cotton, GRS				--	--		
Recycled cotton, RCS				--	--		
Responsible Brazilian cotton, ABR							
Cotton with no standard system							

Numbers refer to the level of impact



Baseline



Foundational



Improved



Progressive



Transformational

Source: Textile Exchange.

Materials assessed in the PFMM receive a score from 0 (which is considered the baseline, where not enough criteria are met or evidence is lacking to receive a level 1 score) to 4 (which is transformational, characterized by regenerative or circular practices, or both, with long-term goals in place that are tracked over time and where beneficial outcomes and impacts are demonstrated). Full details of scoring can be found on the [Textile Exchange website](#).

Note that because the PFMM currently focuses on the assessment of standard systems at the field level, and because such standards do not yet exist for leather (the Leather Working Group program addresses impacts related to hide processing only), the tool doesn't currently cover leather.

Figuring Out How to Change Your Raw-Materials Impact

What does all this mean in practice? Brands can use the PFMM to make informed sourcing decisions and to identify opportunities to improve the performance of their raw materials toward climate goals.

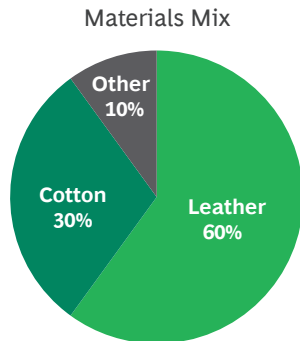
To illustrate how brands can use the PFMM, we created three brand archetypes with different materials portfolios:

- One that is cotton rich (most likely a pure fashion brand)
- One that is leather rich (most likely a luxury brand)
- One that is polyester rich (most likely a sportswear brand)

The PFMM can also help brands identify actions they can take to achieve immediate (within 12 months) and short-term (within 24 months) impacts; these actions are generally tied to more frequently used material types and blends. (See [Exhibits 6, 7, and 8](#).) Longer-term solutions tied to less common types and blends can also be identified; however, we do not show these solutions. We advise brands to act on the immediate and short-term opportunities; these will provide the quickest and biggest payoffs and will inform longer-term moves.

While each brand will have a different raw-materials focus depending on its materials portfolio, the industry should share an ambition: to fully eliminate fossil-fuel-based virgin fibers and to use only sustainably sourced renewable or recycled materials. The Materials Manifesto, developed by BCG, Textile Exchange, and Quantis, details the key enablers for brands to set themselves up for success.

Exhibit 6 - A Lower-Carbon-Impact Materials Strategy for a Luxury Brand



Leather

Act now for immediate impact (within 12 months)

Sign up to the Textile Exchange Deforestation Free Call to Action

Move to certified leather (Leather Working Group - Gold)¹

Move toward traceable leather

Example actions:

- Source from certified tanneries
- Advocate for tanneries to adopt lower-impact production methods
- Explore options for recycling leather scraps and repurposing discarded products into new items

+ Cotton

Act now to see initial impact in the short term (within 24 months)

Invest in regenerative grazing practices with science-backed potential for scale and lower carbon impact

Example actions:

- Build relationships with cattle producers and leather processors to invest in regenerative grazing practices and outcome measurement
- Support research and development of alternative leather options (e.g., mushroom and fruit leather)
- Support research on vegetable-based, chrome-free tanning, etc.

Transition to certified organic (e.g., Organic Content Standard or Global Organic Textile Standard) or regeneratively grown cotton

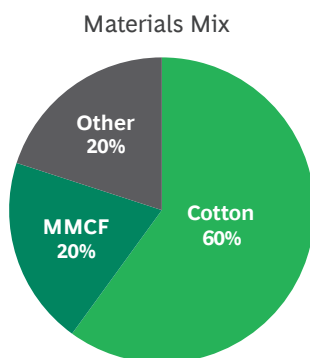
Example actions:

- Incentivize the adoption of regenerative farming practices by sharing financial risks and opportunities with farmers and growers

Source: Textile Exchange, Quantis, and BCG analysis.

¹According to the Leather Impact Accelerator, the Leather Working Group leather does not impact Tier 4 raw material production because the program benefits take place at Tier 3 during tanning and processing.

Exhibit 7 - A Lower-Carbon-Impact Materials Strategy for a Pure Fashion Brand



Cotton

Act now for immediate impact (within 12 months)

Transition to certified organic cotton (e.g., Organic Content Standard or Global Organic Textile Standard), starting with investing in in-conversion cotton

Example actions:

- Incentivize the adoption of alternative farming practices by sharing financial risks and opportunities with farmers and growers

+ MMCF

Act now to see initial impact in the short term (within 24 months)

Increase the share of organic and regenerative cotton in the materials supply

Example actions:

- Build direct relationships with cotton producers to invest directly in the implementation of regenerative farming practices and measurement of outcomes
- Invest in innovative technologies that use cotton waste as feedstocks
- Optimize the quality of recycled cotton

Increase share of certified MMCFs (e.g., Forest Stewardship Council certification or Programme for the Endorsement of Forest certification)

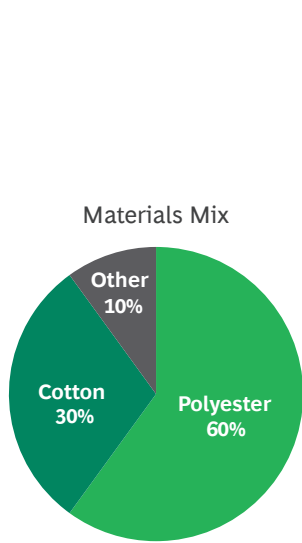
Example actions:

- Ensure that deforestation is not present in the supply chain by investing in full end-to-end traceability
- Source from green shirt suppliers as deemed by CanopyStyle Hot Button Report

Source: Textile Exchange, Quantis, and BCG analysis.

Note: MMCFs = Manmade cellulosic fibers.

Exhibit 8 - A Lower-Carbon-Impact Materials Strategy for a Sportswear Brand



Polyester

Act now for immediate impact (within 12 months)

Increase the share of credible certified recycled polyester in the materials supply (Global Recycled Standard)

Example actions:

- Scale existing solutions that increase the durability of polyester
- Train and upskill designers to ensure compatibility with recycling processes
- Explore options to transition from non-fashion PET feedstocks (e.g., plastic bottles) to textile feedstocks

+ Cotton

Act now to see initial impact in the short term (within 24 months)

Invest in fiber-to-fiber recycling solutions and partnerships or memberships that help to scale promising new technologies (e.g., Fashion for Good)

Example actions:

- Identify and invest in significant infrastructure investments to enable textile-to-textile recycling
- Partner with innovators producing polyester alternatives

Transition to certified organic (e.g., Organic Content Standard or Global Organic Textile Standard) or regeneratively grown cotton

Example actions:

- Incentivize the adoption of regenerative farming practices by sharing financial risks and opportunities with farmers and growers

Source: Textile Exchange, Quantis, and BCG analysis.



The Materials Manifesto

A brand's sustainability transformation can achieve impactful change in many ways—through improved forecasting to combat the issue of overstock, for example, or through circular business models such as resale and rental services. But the BCG/Textile Exchange/Quantis Materials Manifesto has a sole and dedicated focus on raw materials. Its six principles show brands how to close the materials gap, demonstrating that in a space fraught with questions, some answers are in place to guide no-regrets moves. (See Exhibit 9.)

Invest in and Embed Full Traceability to De-Risk Supply Chains and Fully Understand Materials' Impacts

The imperative for traceability is clear. As Chris Gaffney, the CEO of Johnstons of Elgin, put it, “No organization should expect to succeed and create transformational change without traceability. It just needs to happen as a ground zero.”

Traceability is a fundamental requirement and starting point in the transformation to preferred raw materials. It is critical for decision makers within brands to understand what type of materials are used, their origins, and how they are processed to gain a clear understanding of their impacts.

Exhibit 9 - The Materials Manifesto: Six Principles for Brands to Future-Proof Their Materials Strategy



Invest in and embed full traceability to de-risk supply chains and fully understand materials' impacts



Use a science-based approach to strengthen decision making and satisfy stakeholders



Diversify the materials portfolio to spread risks and future-proof operations



Build a business case that leads to a triple win—for brands, for suppliers, and for nature



Supply chain relationships will make or break brands going forward. Strengthen them diligently.



Ensure that knowledge, tools, and incentives are engrained throughout the company

Sources: Textile Exchange; Quantis; BCG.

Sustainability standards and certifications are pivotal in supporting these aims. Other key enablers include developing cross-functional programs and systems to enable materials and product traceability and building direct relationships across the supply chain.

These investments might be seen as a cost burden. They are not, really, when you consider their crucial role in a brand's future and the potential returns, including reduced GHG impacts. They provide the foundation to monitor progress and formulate action plans to achieve targets, meet regulatory requirements, identify risks, and better engage with stakeholders.

Brands should consider establishing a head of traceability to lead collaboration across the sustainability, legal, IT, and marketing teams to ensure an aligned approach and enable better data quality to meet regulatory demands and evolving customer expectations.

One sustainability professional from the luxury industry told us, "Our recently hired head of traceability has professionalized our approach to de-risking the supply chain and has helped provide greater assurance to our many and varied stakeholders that any sustainability claims we make are credible."

Use a Science-Based Approach to Strengthen Decision Making and Satisfy Stakeholders

Over the last ten years, the industry has begun to embrace science-based methodologies that allow brands to make decisions underpinned by facts, data, and impact assessments.

However, relying on perfect science can stymie brands. As Stefan Seidel, the head of corporate sustainability at Puma, warned, "Perfect data often doesn't exist. Brands cannot be inactive just because of that. Start with the available data and keep striving to improve, but don't let imperfection block progress."

To avoid inertia, brands should become comfortable with acting on imperfect data, understanding that data and impact factors will mature over time. They should select a methodology and use it to guide—but not dictate—decision making.

By scientifically assessing the benefits and tradeoffs of each materials option and using a holistic view of impacts across the product life cycle, brands can make informed, impact-oriented decisions and prioritize their investments.

And a science-based approach to understanding impacts can work in tandem with traceability, enabling brands to measure and collect data specific to their supply chains. This in turn will allow them to make more quantifiable claims in line with forthcoming regulations.

Nonetheless, brands should remain aware of the limitations of the methodologies used and be comfortable disclosing these limitations publicly. A science-backed approach should be complemented with transparency, accountability, and credible communication with stakeholders, providing regular progress updates.

Diversify the Materials Portfolio to Spread Risks and Future-Proof Operations

Because there is no one-size-fits-all solution to transforming for sustainability, a portfolio approach to sourcing raw materials is the best way for brands to prepare for the future. It recognizes that there might not be a single material or certification that meets the needs of the brand and that supply options will evolve over time.¹² As Giovanni Marchi, the director of Marchi and Fildi, stated, “It is imperative for brands to find the right balance with their materials portfolio. They should avoid concentrating all their sustainability efforts on a single fiber, a single source of a fiber, or a single technology.”

Indeed, the shift away from conventional, virgin, fossil-fuel-based materials is a positive first step. Across materials categories, brands should consider all alternative materials, including:

- Regenerative, organic, and other certified, sustainably sourced renewable materials
- Sustainably sourced postconsumer recycled materials, prioritizing fibers recycled from textiles
- Materials created using carbon capture technologies, or other innovative renewable or recycled materials with demonstrated lower impacts

Again, taking a science-based approach and knowing materials’ origins will help brands ensure that the impacts of alternative materials are lower than those of conventional materials without compromising on durability.

The portfolio approach should avoid “carbon tunnel vision,” ensuring that other critical aspects of sustainability—such as biodiversity, human rights, and animal welfare—are included.

Build a Business Case That Leads to a Triple Win—for Brands, for Suppliers, and for Nature

Heightened governance means that a resilient and robust business case is more critical than ever. As part of that, brands need to approach their raw-materials strategy with rigor and think one step ahead by considering second- and third-order consequences.

Indeed, taking the long view is a must. The deputy manager of Far Eastern New Century’s filament division, Gloria Lien, emphasized the point: “Moving away from short-term thinking around pricing is crucial. Brand decision making must consider long-term sustainability goals, which can provide stability to the supply chain.”

The business case should comprise realistic, forward-looking financial and economic assumptions and consider:

- The cost of inaction, including no or small changes in the materials portfolio mix without reducing the fossil-fuel-based and land-based conventional virgin materials
- The future cost of externalities currently taken for granted, including the need to protect resources and better manage land in order to avoid raw-materials shortages brought on by natural disasters, which are projected to increase and intensify as a consequence of climate change
- Risk factors related to materials—it is imperative that brands acknowledge the decreasing availability of raw materials and the price increases that will result and thoroughly assess risk by analyzing potential scenarios, including the impact of climate change and social pressures on materials sourcing and the entire supply chain
- Trends in government policy development—it is expected that as the European Union and others find success in rolling out new sustainability-linked legislation, other geographies will follow suit

The business case should include plans to transition and diversify the materials portfolio, starting immediately and intensifying over the coming years. Brands could consider “forward contracting” to support their business case. This financially beneficial practice, common in the precious metals industry, involves locking in guaranteed raw-material prices for the future and supports longer-term change on the ground—a true necessity given that a preferred-raw-materials strategy requires a multiyear perspective.

¹². Textile Exchange, “Companies can manage their climate impact through the materials they use,” July 2023.

And it should consider the cost of carbon within the various operations of the business and how it relates to materials costs and product margins; setting an internal price on carbon or setting “carbon budgets” within product teams are options. A risk assessment regarding materials should also be conducted, thoroughly and with analysis of multiple scenarios—for example, the impact of climate change and social pressures on materials sourcing and the entire supply chain.

Supply Chain Relationships Will Make or Break Brands Going Forward. Strengthen Them Diligently.

Long-term commitments with farmers and growers, mills and spinners, and finished goods suppliers can help to de-risk the availability of preferred materials, increase the security of materials, and send a clear signal to the market about the importance of such materials.

Suppliers as well as industry players need long-term commitments to be able to invest in new practices or technologies—shifting to organic production is a matter of half a decade, for example, and cannot be switched on and off as the market demands. Brands should share strategic plans with such actors, prioritizing partners in core commodity supply chains.

“To scale and advance new and innovative raw materials,” explained Kathleen Rademan, director of innovation at Fashion for Good, “full integration into and across the supply chain is critical. In doing so, costs associated with the integration should be shared across all vested stakeholders including, but not limited to, brands, supply chain partners, investors, and the innovator.”

Direct investments are a smart way to create long-term partnerships; they provide farmers and growers with the stability of upfront funding. The Asia-based manufacturing group TAL Apparel runs a direct-to-grower program, having recognized that “farmers and growers were not getting the message about the need for sustainable farming practices that reduce carbon impacts,” according to Delman Lee, vice chair at TAL. Similarly, in a deal valued at more than €100 million, Inditex committed to buying 30% of Infinited Fiber Company’s production volume of Inifinna, a textile created from 100% textile waste.

Precompetitive initiatives can support brands in combating issues of performance, scalability, and costs associated with preferred raw materials. By pooling resources (investment, time, and expertise), such initiatives engender a mutually beneficial ecosystem, expediting the industry’s transition to sustainable growth.¹³ This can unlock no-regrets solutions (such as regenerative materials and fiber-to-fiber feedstocks), thus helping to drive the production of lower-impact materials, with scaling and consistent performance improvement in mind. Furthermore, it can support the journey toward standardization within the industry.

Standardization requires change. And as Ali Mize, the senior director for ESG, belonging, and corporate philanthropy at Neiman Marcus Group, pointed out, “Multibrand retailers play a unique role in standardizing and scaling the fashion industry’s progress on sustainable raw materials. We collaborate with strategic partners to clearly define preferred materials and certifications for our brand partners, then we feature brands’ relevant products for customers on the Neiman Marcus and Bergdorf Goodman website.”

Brands should also consider engaging their key supply chain partners in discussions about setting SBTi targets to drive decarbonization efforts across the entire value chain. Proactive suppliers, among them TAL Apparel, have already submitted their own science-based targets (pending approval), as have many other credible supply chain partners. This level of alignment across the supply chain will also assist in eliminating the use of coal power in supply chain facilities.

Ensure That Knowledge, Tools, and Incentives Are Engrained Throughout the Company

To drive tangible changes in preferred-raw-materials strategies, companies need to apply the sustainable transformation lens across the organization by ensuring clear sponsorship from the C-suite and embedding their preferred-raw-materials strategy across business units.

For example, every department that makes up the creative team working to develop products and bring them to market (design, innovation, procurement, financial planning, merchandising, marketing) should be engaged, empowered, and trained with enough expertise to make informed decisions about preferred raw materials and understand the challenges that accompany GHG reduction efforts. They should have access to preferred-raw-materials selection tools, like Textile Exchange’s PFMM, that support these processes. Deeper technical expertise can be achieved through a dedicated internal team.

13. B. Webb, “Key takeaways from the Global Fashion Summit: More diversity, more collaboration,” Vogue Business, accessed July 31, 2023.

“Creative teams are sacrosanct,” as a sustainability professional from the luxury industry put it. “Without their buy-in, brands will not realize their sustainability goals. Creative teams hold the ‘keys to the kingdom’ on decisions relating to which materials are used in collections.”

Access to data, including real-time performance data, is critical to tracking impacts and cross-functional delivery. Sustainability, legal, IT, marketing, supply chain, and finance teams must work together to respond to regulatory expectations. These functions need to be equally involved and accountable. Brands should also consider establishing or bolstering their dedicated policy and public affairs teams to cope with the complexity.

Finally, money talks. Brands must find ways to drive sustainability performance at the board and C-suite levels and beyond. They should consider introducing dedicated incentives (such as bonuses linked to reaching carbon reduction targets) that are tailored to each job function so that employees can directly influence targets no matter what role they play. Leaders and employees need to be driving toward agreed upon, measurable, and actionable targets that will enable the changes needed within the company and across the industry.

In the face of climate disaster, increasing regulations over the next two to five years, and investor and consumer scrutiny, fashion and apparel brands cannot afford to underinvest in their raw-materials strategies any longer. In fact, doing so will be a competitive disadvantage.

There’s plenty of room for brands to create advantage. Based on the current trajectory, only 19% of materials in 2030 will be preferred, given the current lack of economies of scale for preferred materials. To succeed in the longer term, brands should follow the six principles of the Materials Manifesto to secure a lower-impact supply of core raw materials and thus put those necessary economies of scale in motion.

It will take years to seed and grow the supply of preferred raw materials that fashion and apparel brands need. Why not act boldly now and quickly win over regulators, investors, wholesalers, and consumers—and make a true impact on climate remediation?

Appendix: Explaining the Net Profit Opportunity

Assumptions

Assumption		Scenario 1	Scenario 2	Scenario 3
		Baseline, a brand that continues business as usual, making no changes to its materials portfolio	A brand that makes a small change to its materials portfolio	A brand that makes substantial changes to its materials portfolio
Annual growth rate		1.5% ¹	2% ²	2% ²
Material price per unit	Conventional virgin materials	\$2.50	\$2.50	\$2.50 ³
	Sustainably sourced renewable materials	\$3.75	\$3.75	\$2.50
	Sustainably sourced recycled materials	\$3.00	\$3.00	\$2.13
Share in material portfolio	Conventional virgin materials	90%	70%	40%
	Sustainably sourced renewable materials	5%	15%	30%
	Sustainably sourced recycled materials	5%	15%	30%

Sources: Textile Exchange; BCG analysis.

¹Slower year-on-year growth due to increased pressure on sales and product availability from regulatory noncompliance (e.g., products being banned from entering markets) or lack of materials availability.

²Annual growth for industry set at 2% based on Euromonitor data where Western brands are expected to grow by 2%–5% over the next five years.

³Where cost of material differs from the baseline, costs change only from year 2 onwards because of catalogue planning.

Exemplary Profit & Loss for a Fashion and Apparel Brand, in Three Scenarios

Year	Year 0	Scenario 1 Year 5	Scenario 2 Year 5	Scenario 3 Year 5
Total revenues (000s)	\$1,000,000	\$1,080,000	\$1,100,000	\$1,100,000
Cost of goods sold (000s)	\$300,000	\$310,000	\$320,000	\$310,000
Gross profit (000s)	\$700,000	\$770,000	\$780,000	\$790,000
Operating expenses	Selling, general, and administrative expenses	\$200,000	\$200,000	\$200,000
	Regulatory fees ¹	\$40,000	\$40,000	\$30,000
	Financing costs	\$10,000	\$10,000	\$10,000
	Tax	\$90,000	\$110,000	\$110,000
Net profit (000s)	\$360,000	\$410,000	\$430,000	\$440,000

+4% +6% +8%

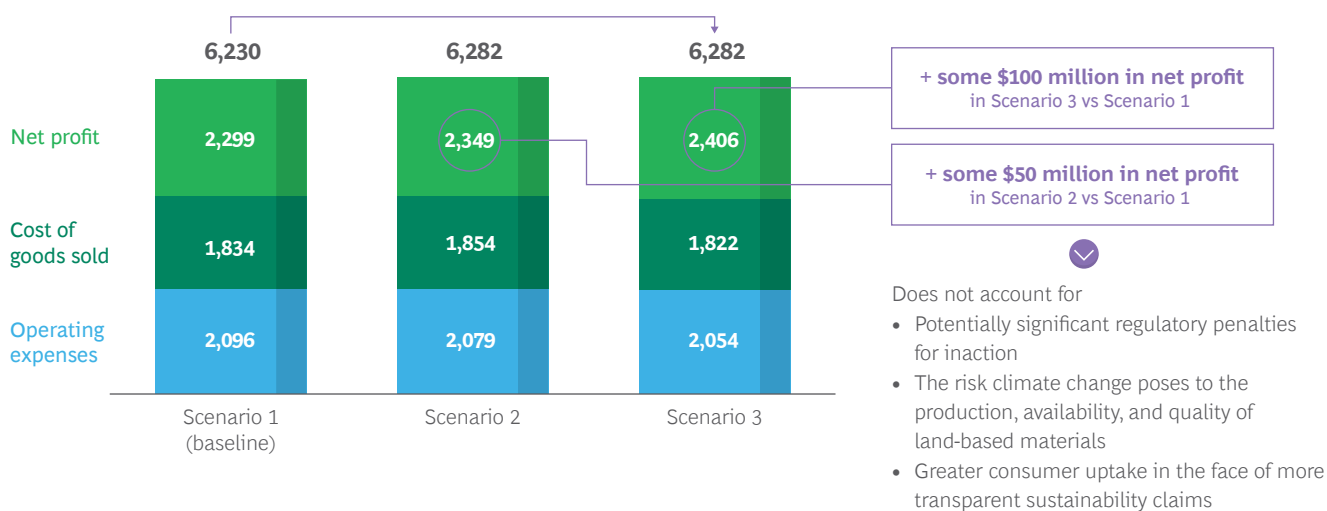
Average of +6%

Source: BCG analysis.

Note: Based on a sample fashion brand, which is a midsize, high-street brand with annual revenues of approximately \$1 billion.

¹Does not include any nonstandard costs such as exposure to regulatory risks or costs for potential legal action.

Cumulative Opportunity from Year 0 to Year 5



Source: BCG analysis.

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