

3rd Edition Sustainable Textiles Summit

Sustainable Solutions for a Global Textile Future

Weaving a Greener Future: The Urgency of Sustainable Textile Solutions

Understanding the environmental impact of textile and apparel industry and decarbonization strategies to shift towards sustainability



About the Authors



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The Global Shift Towards Sustainability

With changing consumption patterns, technological disruptions, heightened emphasis on sustainability, and emergence of new business models, the global textile & apparel industry is undergoing a massive structural shift. Out of these, the urgency to adopt sustainability makes up for one of the most pressing issues. Stakeholders in the textile value chain are becoming more aware and vocal about how the industry has hampered the entire ecosystem over the years, with the tremendous use of water for production, high chemical consumption, greenhouse gas emissions, release of microfibers and microplastics, as well as high share of the industry in global land, air and water pollution.

Textiles contribute to 9% of microplastic pollution in oceans^[1], consuming 93 billion cubic meters of water annually—equivalent to the annual water needs of five million people^[2]. The industry is said to be world's second largest water polluter, contributing to 20% of all industrial water pollution worldwide and consuming 23% of all chemicals produced worldwide^[3]. The greenhouse gas emissions of the industry are also enormous forming 5-10% of the global carbon emissions^[4]. Additionally, majority of the T&A produced globally is incinerated or ends up in landfills with only meagre 1% being recycled^[5].

The global apparel consumption is estimated to increase from approximately USD 1.7 trillion in 2023 to USD 2.3 trillion by 2030^[6], and the environmental impact will increase manifolds in a do-nothing scenario. Due to this significant impact, the textile and apparel industry is at the forefront of sustainability discussions today requiring urgent actions and solutions.

^[1] UNEP: Press research, Microplastics: The long legacy left behind by plastic pollution

^[2] United Nations: Press Research, UN launches drive to highlight environmental cost of staying fashionable

^{[3][4]} Sustain Your Style: Press Research, what's wrong with the Fashion Industry?

^[5] Bloomberg: Press Research, the Global Gut of Clothing is an Environmental Crisis

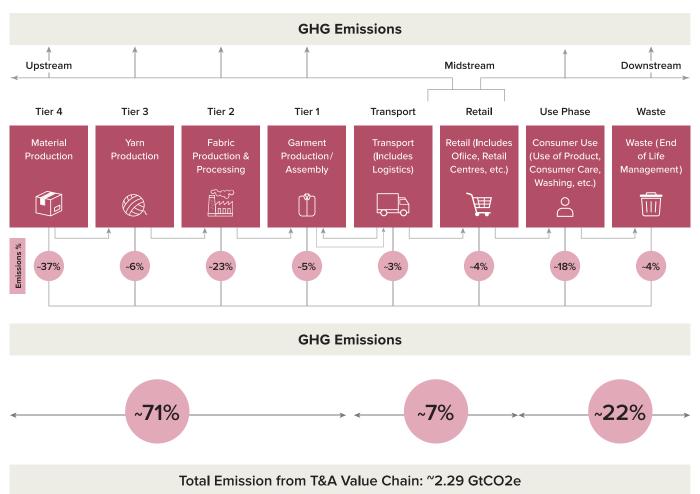
^[6] Wazir Advisors: Annual Report, Indian Textile & Apparel Industry 2024

Impact of Textile and Apparel Industry's GHG Emissions

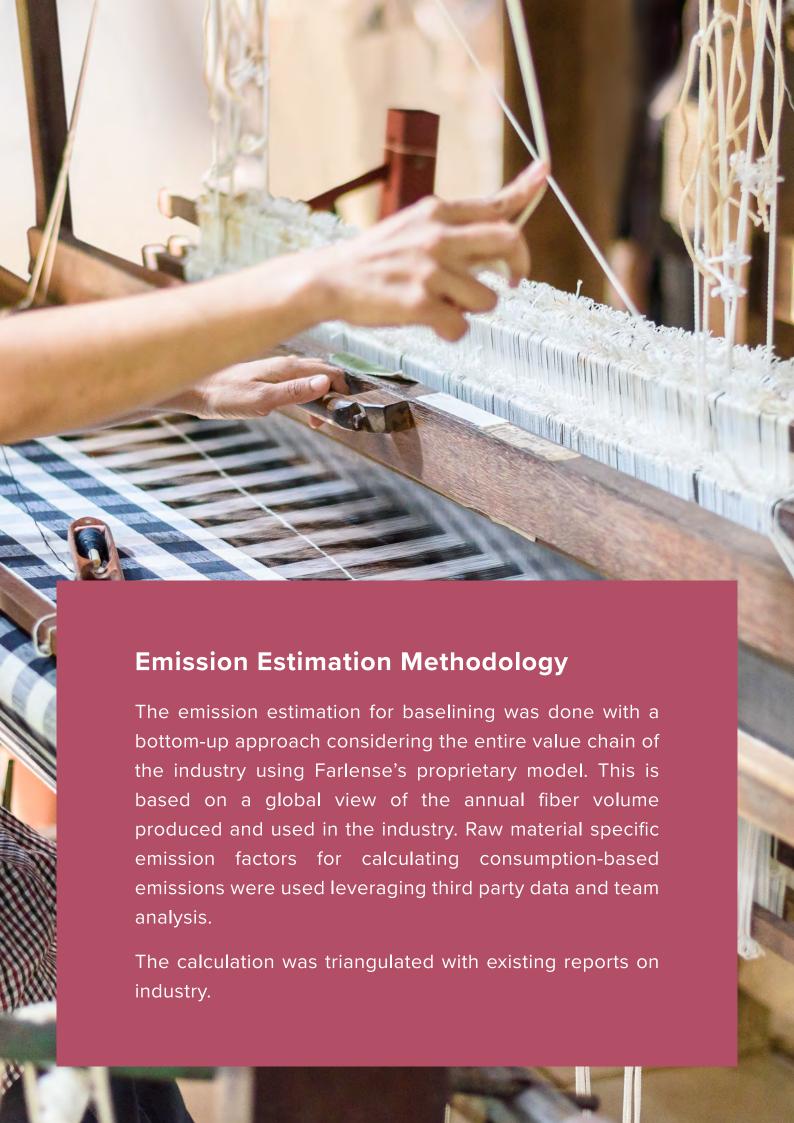
The textile and apparel industry contributes to 5-10% of the global GHG emissions, reaching ~2-3 Gigatons of CO2 emissions annually. More than 70% of these emissions occur till the garment production stage of the value chain. Further, more than 60% of the total emissions take place in upstream activities like raw material production as well as energy intensive spinning, dyeing & processing of yarns & fabric. This also includes farm emissions from non-sustainable cotton farming practices and synthetic textiles extraction processes^[7].

Approx. 20-22% of the GHG emissions are contributed by the downstream activities of a garment lifecycle which include use and disposal. Logistics and retail make up for the remaining emissions.

Value Chain from Cradle to Grave



Source: Farlense Decarbonization Team Analysis



Evolving ESG Guidelines and Decarbonization Pressure

There is an increasing demand for the textile and apparel industry to comply with evolving Environmental, Social, and Governance (ESG) guidelines and reach decarbonization targets. Companies and brands are being pushed to reduce carbon emissions, adopt sustainable materials, and implement energy-efficient processes to align with global climate goals. The Paris Agreement, a pivotal international accord on climate change is an example. The agreement was adopted by ~196 countries at United Nations Climate Change Conference (COP21) in Paris in 2015 wherein they agreed to set the ambitious goal of limiting global warming to well below 2.0 C, preferably to 1.50 C, compared to pre-industrial levels.



01

Global Regulatory Push for Decarbonization

Governments and international organizations have introduced regulations and frameworks to guide the sector toward more responsible and sustainable practices, with the EU leading with its recent green policy.

■ EU's Carbon Border Adjustment Mechanism (CBAM)

The European Union proposes duty on imported goods that release greenhouse gas emissions during production. This is part of the European Green Deal, a plan launched in 2020 to make Europe carbon-neutral by 2050. The goal is to cut carbon emissions by at least 55% by 2030. The EU aims to prevent carbon leakage and lower overall emissions by taxing imports with high emissions. This Carbon Border Adjustment Mechanism (CBAM) is expected to create significant repercussions for textile and garment exporters, making their products more expensive in the EU due to the new tax on carbon emissions from their production^[8].

■ EU's 2030 Vision for Textiles

The strategy document outlays an ambitious target and vision for sustainable and circular textiles by 2030. It emphasises that textile products on the EU market are long-lived and recyclable, made mainly of recycled fibres, free of hazardous substances, and produced for social rights and the environment^{[9].} Key actions include introducing mandatory Eco-design requirements, tackling microplastic pollution, extending producer responsibility and boosting the reuse and recycling of textile waste, carrying out due diligence on the environment and social fairness, etc.

US Textile Regulations

As the demand for accountability and sustainability grows, the federal and state governments are creating new rules to address how businesses affect the environment^[10].

- California's Climate Corporate Data Accountability Act (SB 253): This state law requires
 large California fashion companies to report their greenhouse gas (GHG) emissions
 annually. It applies to companies with over USD 1 billion in revenue and includes reporting
 on all their emissions (Scope 1, 2, and 3).
- New York Fashion Act: If it becomes law, it will mandate fashion brands to detail out their products' environmental and social impacts. This includes identifying, preventing, and addressing adverse effects from their operations and supply chains.
- California's Greenhouse Gases: Climate-Related Financial Risk Bill (SB 261): This bill requires over 10,000 companies with revenues above USD 500 million to assess and report the financial risks anticipated due to climate change.
- The Fabric Act: Introduced in the US Senate in May 2022, the Fashion Accountability and Building Real Institutional Change (FABRIC) Act aims to address the environmental and social impacts of outsourcing garment production. It promotes transparency and ethical standards in the fashion supply chain.

United Nations Framework Convention on Climate Change (UNFCCC) Fashion Industry Charter for Climate Action:

The Paris Agreement has set ambitious targets for reducing global emissions to limit global warming to less than 2 degrees above pre-industrial levels, with the preferable target of 1.5 degrees and the textile industry, a significant contributor to greenhouse gases. Garment stakeholders came together in 2018 to commit to climate action, forging the United Nations Framework Convention on Climate Change (UNFCCC) Fashion Industry Charter for Climate Action^[11].

02

Indian Carbon Credit Trading Scheme (CCTS)

India's regulatory landscape has been instrumental in driving sustainability within the textile industry. Carbon Credits Trading Scheme (CCTS), set to start in 2025-26 underlines India's move to leverage climate finance and low-cost climate technologies for a just economic transition. This new system will create a unified Indian Carbon Market where companies can trade carbon credit certificates to help reduce greenhouse gas emissions. Obligated companies with emission targets must either lower their emissions or buy these credits, while others can still participate by registering projects and earning credits. This scheme allows private companies to either limit their emissions and comply with new regulations or gain extra revenue from the growing global carbon trading market.

03

Shifting Consumer Preferences

Changing consumption patterns have diluted the dominance of cotton over the years. The shift towards a healthier and more active lifestyle is encouraging the industry to move towards synthetic fibres like polyester while consumer's focus on finding sustainable alternatives to their clothing has led to the need of 'eco-friendly' fashion. This trend has gained traction as the large amount of textile and apparel industry waste ending up in landfills, having a huge impact on the environment as well as the inhumane conditions the workers are subjected to in the fast-fashion industry came to light. Today's consumers are woke and understand the graveness of these factors. They are enthusiastic towards contributing to the change in whichever manner possible, and are hence switching from fast fashion to eco-friendly fashion, which not only attempts to minimize the impact on the environment but also focuses on the health and the working conditions of its workers.



04

Increased Use of Alternative Fibres

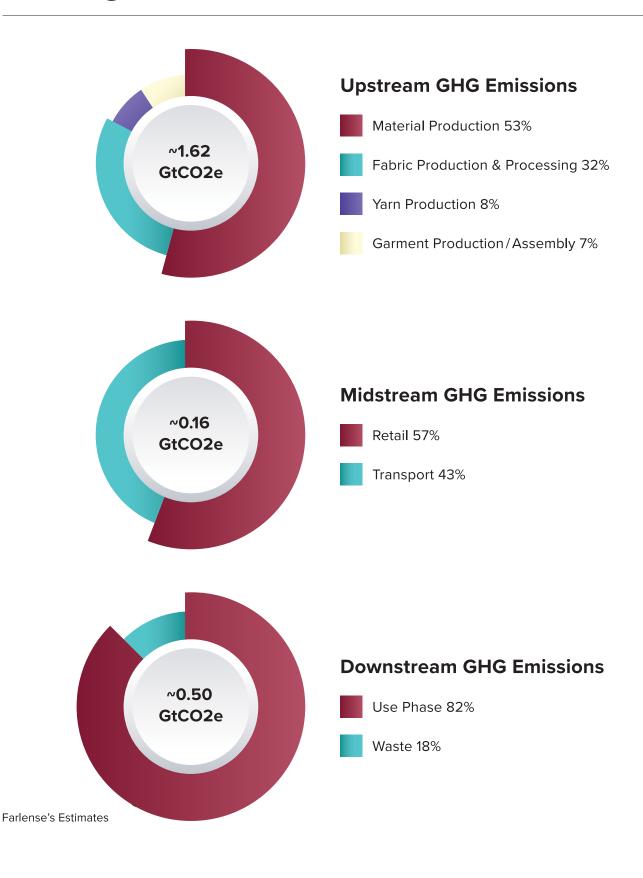
Consumers are looking for sustainable alternatives that are functional, fashionable and cost-effective, which has led to the introduction and increased use of alternative fibres. These fibres can be plant or microbe derived, recycled, blends of various fibres, or cultivated through animal cells or even fungi. The receptiveness towards adopting such fibres is high, especially in case of Gen Z and Millennial consumers. On the whole, approximately 50% of the global population^[12] is moderately willing to purchase these fibres and it is estimated that they'll form 3% of market by 2026 amounting to approximately US\$ 2 billion.

Some companies have already progressed in this area and are leading the next-gen material space:

♦ Spiber	Produces spider silk proteins via precision fermentation to create next-gen silk
BOLT THREADS	Uses mycelium to produce leather & uses precision fermentation to produce spider silk proteins
SPINNOVA®	Uses bio mass pulp or paper pulp to produce next-gen wool
A CONTRACTOR OF THE CONTRACTOR	Grows mycelium to produce next-gen leather
VitroLabs Inc	Uses stem-cell technology and tissue engineering to cultivate real skins to produce next-gen leather/exotic skins
MODERN MEADOW	Develops a technology application platform, including a protein and bio-polymer blend that is applicable to next-gen leather

The effect of all the above factors is expected to trickle down to tier-n players present in countries of production like India, where the need to better understand one's environmental impact along with necessary tools to report carbon foot printing will become absolutely essential.

Addressing Industry Emissions and Abatement Strategies: Moving Towards Decarbonization



Upstream Emissions

Scope: Upstream

Relevant Steps - Material Production

Potential Levers						
Regenerative Agriculture Practices Adoption of regenerative agricultural practices for cotton cultivation, Reduction in pesticide and fertilizer usage by ~20-30% with targeted use in cotton farming	For Synthetic Fibers (Polyesters) Polymerization, switching from coal/natural gas to sustainable fuel/electric boilers for energy efficiency improvement	Increasing the R-Pet usage and other material mix	Renewable Energy in Production processes (use of on-site renewable energy, power purchase agreements)			
Collective Abatement Potential for Upstream Abatement						
	~16%					
Feasibility						

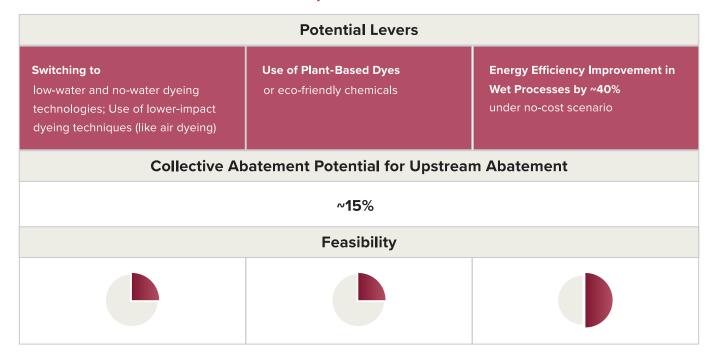
Relevant Steps - Yarn Production

Potential Levers	Minimizing Energy Consumption in yarn spinning and texturing, through modernized machinery along with ~20% efficiency improvement
Collective Abatement Potential for Upstream Abatement	~5%
Feasibility	

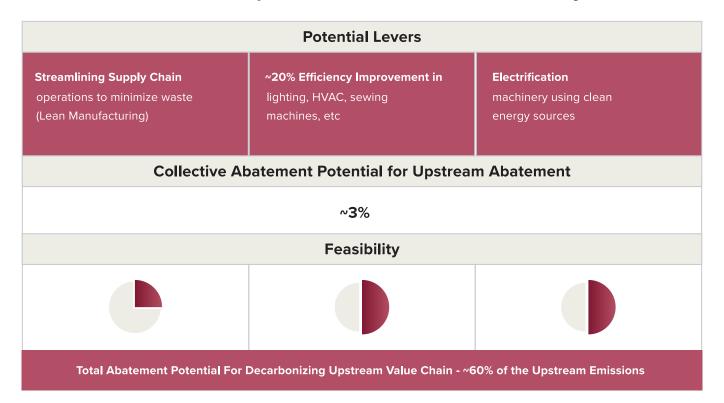
Upstream Emissions

Scope: Upstream

Relevant Steps - Fabric Production



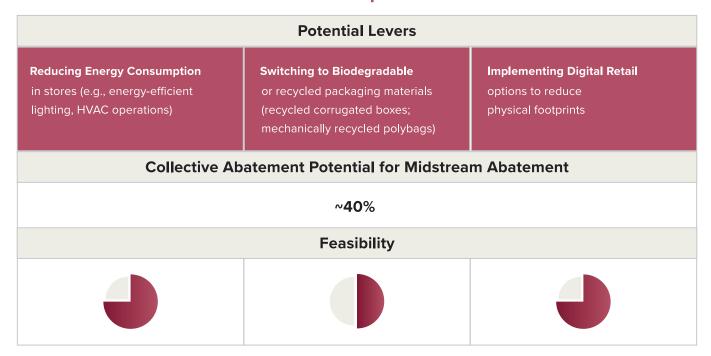
Relevant Steps - Garment Production / Assembly



Midstream Emissions

Scope: Midstream

Relevant Steps - Retail



Relevant Steps - Transport



Downstream Emissions

Scope: Downstream

Relevant Steps - Use of Product

Potential Levers Encouraging Consumers to wash at lower temperatures and less water Collective Abatement Potential for Downstream Abatement

~38%



Relevant Steps - End of Life



~18%



Of the 55-75% overall identified abatement potential, upstream operations hold the potential to abate 40-50% of the entire value chain emissions, while \sim 5-8% is tied to retail and logistics, and the remaining 10-15% depends on promoting the use of products & end-of-life-cycle^[13]. Reaching this potential, however, will require cumulative efforts by all the stakeholders along the value chain to scale up and intensify the current decarbonization approach.

The Onus of Achieving the 1.5-Degree COP21 Target

Brands and Retailers

- Prioritizing emissions transparency and setting targets is crucial for retailers. Tracking and analysing their emissions performance, establishing science-based targets aligned with the Paris Agreement, and developing clear plans and governance structures for decarbonization.
- Engage in transparent consumer communication to establish labelling standards and provide clear, accessible information to consumers. Honest communication about sustainability efforts can boost brand loyalty and engagement.
- Drive sustainable product design and innovation to focus on sustainable material use, reduce production waste, and promote end-of-life recycling. Consider investing in research for alternative materials to drive broader industry improvements.

Manufacturers

- Coordinate decarbonization efforts by involving factories, material producers, and other upstream players in decarbonization programs. Support these partners in tracking and analyzing their emissions using tools like abatement cost curves. Align targets and actions with key value chain partners to ensure coordinated decarbonization.
- Foster close partnerships with value chain stakeholders by evaluating purchasing practices and incentivising decarbonization efforts.
- Waste Reduction by minimizing waste through better resource management and recycling initiatives. The shift towards a circular economy can help reduce the overall environmental footprint of the industry.

Government and NGOs

- Policymakers are crucial in promoting decarbonization by incentivizing sustainable practices and responsible consumption. For instance, the European Union's Green Deal and France's ban on destroying unsold fashion goods are steps in this direction^[14].
- Support specific levers for decarbonization by promoting policies that encourage sustainable products and services through measures such as waste reduction taxes and recycled content requirements^[15].

Investors

- Invest in innovative and supporting sustainability-focused solutions for decarbonization challenges, such as closed-loop recycling, sustainable materials, and demand prediction models to reduce overproduction.
- Recognising that strong ESG performance is linked to better financial results. Investors should drive their portfolio companies to accelerate decarbonization, adopt science-based targets, and be accountable for their environmental impact.
- Drive emissions transparency in value chain emissions and support using standardized sustainability assessments, like the Higg Brand & Retail Module, across portfolio companies.

Consumers

- Opting for brands that prioritize sustainability, in turn influencing market trends and encouraging more companies to adopt eco-friendly practices^[16].
- Engaging in recycling initiatives and reducing overall consumption
- Wash & dry clothes less often to extend their lifespan & lower their environmental impact^[17].
- Opt for fashion items that last longer and help reduce the need for new production.



Building Sustainable Supply Chains

Sustainable supply chain management is extremely critical at this juncture to expedite the joint decarbonization efforts in the fashion industry. Decarbonizing the supply chain helps mitigate environmental impacts, leverage technological advancement, enhance economic performance, and build brand image. With a contribution of more than 90% to organization's greenhouse gas emissions and 50% to 70% of its operating costs, it becomes even more imperative for companies to focus on their supply chain sustainability^[18].

The decarbonization strategy for the supply chain helps organizations minimize the environmental impacts and deliver the maximum result in creating the brand and achieving net zero targets. Moreover, efficient supply chain management meets regulatory and consumer demands and unlocks opportunities for cost reductions and operational improvements. By embracing sustainable practices, businesses can improve their brand image, attract eco-conscious consumers, and gain a competitive edge in the marketplace.

Key Approaches to Sustainable Fashion Supply Chain Management

01

Green Procurement

The sourcing of material from manufacturers who are aligned with environmental laws and standards. The organization's brand value boosts by 15% to 30% by switching to sustainable procurement^[19]. Prioritizing suppliers who offer eco-friendly products, use renewable energy, and focus on minimizing waste and emissions is crucial.

02

Optimizing Transport and Logistics

Switching to eco-friendly transportation options, smart routing, carbon-neutral shipping, and an electrifying delivery fleet helps reduce emissions and fuel consumption. Small efforts such as setting the speed limit for transport vehicles help significantly save up to USD 3 million in fuel costs annually and limit emissions^[20]. Additionally, inventory optimization techniques and warehousing management systems can help reduce waste and energy consumption in the supply chain.

03

Utilizing Technologies

The advancement in analytics, the Internet of Things (IoT), and blockchain enable manufacturers to track and trace products throughout the supply chain, identify areas for sustainability improvements, and make data-driven decisions. Around 80% of supply chain managers consider data analytics essential for cost and carbon reduction^[21].

04

Recycling Solutions

Promotion of clothing rental or secondhand marketplace, take-back schemes for repurposing and recycling garments, and design for disassembly for easier recycling can enhance the brand value.

In the fashion industry, switching to green practices, particularly in the supply chain, is crucial for decarbonizing the value chain and enhancing ESG objectives. The organization must identify the correct strategies and focus on implementation for a greener future. Monitoring performance, setting the targets, and meeting the goal should be the priority.

Brands' Shift Towards Sustainable Supply Chains

Brands are shifting toward sustainability to attain their net zero targets and lower their impact on climate as well as on the environment.



- Reduce absolute scope 1, 2, and 3 CO2 emissions by 56% compared to 2019.
- As of 2023, H&M has cut 24% of scope 1 & scope 2 emissions and 22% of scope 3 emissions.
- By 2030, H&M aims to become a fully circular fashion company, using materials that are either recycled or sustainably sourced.
- The company targets carbon neutrality by 2040.
- H&M plans to reduce water usage in its supply chain by 60% by 2030.



- Nike has increased the use of recycled materials in its products, including recycled cotton, rubber, and polyester.
- All cotton used in Nike products comes from Better Cotton, recycled cotton, or certified organic cotton.
- Nike aims to divert all waste from its global supply chain away from landfills.
- By 2025, Nike plans to power all its owned and operated facilities with renewable energy.
- Nike targets a 30% reduction in carbon emissions across its entire global supply chain by 2023.



- C&A aims to cut water usage in its supply chain by 50% by 2030.
- The company plans to reduce its carbon footprint by 50% by 2030.
- C&A is boosting its use of sustainable materials, including organic cotton & recycled polyester.



- Zara aims to use 100% sustainable materials by 2025 and is working towards a fully circular fashion model.
- The company is committed to achieving carbon neutrality by 2025.
- Zara has set a goal to reduce water consumption in its supply chain by 50% by 2025.



- By 2025, Levi's aims to reduce water usage across its global supply chain by 50%.
- The company works towards zero landfill waste at its owned and operated facilities.
- Levi's is committed to sourcing 100% renewable electricity for its global operations.
- By 2030, Levi's plans to cut Scope 1 & 2 greenhouse gas emissions by 46% and Scope 3 emissions by 30%.

Circular Business Models: A Futuristic Approach

Sustainability will bring with itself a huge shift from the current linear business model to a circular model such that minimum waste is generated from the industry. What was considered as waste will actually be used as raw material for either production of similar products or upcycling or downcycling, depending on its condition. Manufacturers should evaluate setting up of infrastructure and processes to reuse the industrial waste (or set-up a new business line altogether) instead of being dumped in landfills or incinerating them. This shift towards circularity is one of the keys and rapidly evolving approaches to climate-conscious business in the fashion industry. The circular business model can extend the product lifecycle and reduce emissions from additional production. This multistakeholder approach will require brands to partner with retailers and upstream value chain players.

Accelerating the adoption of a circular business model could help decouple volume growth from value growth. One such model is the **3R- Re-commerce, Re-purpose and Rental.** The adoption is expected to increase decently over the coming years. For example, Consumers increasingly turn to resale sites like ThredUp, Poshmark, Depop, and Rent the Runway for pre-owned products, which are often cheaper than new items and help reduce overall consumption. The global e-commerce market is expected to reach USD 350 billion by 2028, growing 10% yearly^[27]. Additionally, 85% of consumers worldwide are now involved in buying or selling secondhand goods. ^[27]This trend highlights a rising interest in sustainable choices. By refurbishing and reselling products, brands can reduce their environmental impact and enhance their reputation.

Envisioning a future with smaller, high-value wardrobes, a robust re-commerce and rental market, and extensive repair and refurbishment services is not just a necessity for aligning with the 1.5-degree goal but a source of inspiration. Despite potential volume growth slowing, these new consumer needs offer significant opportunities for companies to adapt their service models effectively, fostering growth and innovation in the fashion industry.

How Wazir-Farlense Can Help?

Wazir Advisors is a management consulting firm established in 2008 with the objective of creating a firm that is a "Trusted Advisor" to its clients. Wazir assists clients in strategy formulation and execution, forming alliances and joint ventures, transformation and change management, market analysis and due diligence - thereby providing end to end solutions spanning across the complete business cycle.

Farlense is more than a decade-old consulting firm dedicated to sustainability. Farlense focuses on fostering growth, social responsibility, and transparent governance and has successfully managed various projects to achieve net zero, decarbonization, and enhance ESG strategies and scores across organizations.

Together, Wazir-Farlense can assist businesses in decarbonizing to achieve net zero goals and building long-term strategic growth plans:



Development of a Sustainability Roadmap

based on gap audit and industry, international or buyer benchmarking



Defining a Baseline

to understand carbon footprint and prioritize the focus area



Scenario Analysis for the Initial View

on abatement potential and cost implication through Marginal Abatement Cost Curve (MACC)



Planning the Initiatives with Actionable Steps

clear responsibilities, and measurable goals. Prioritizing and scheduling these steps and set specific targets, including Science-Based Targets (SBTi)



Facilitating Potential Collaboration

opportunities between stakeholders across the value chain



Tracking Performance by Implementing Actions

setting up proper governance, adjusting plans as needed, and using dashboards and KPIs for external reporting



About PHD Chamber of Commerce and Industry

PHDCCI has been working as a catalyst for the promotion of Indian industry, trade and entrepreneurship for the past 119 years. It is a forward looking, proactive and dynamic PAN-India apex organization. As a partner in progress with industry and government, PHDCCI works at the grass roots level with strong national and international linkages for propelling progress, harmony and integrated development of the Indian economy.



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