Taking Stock of Progress Against the Roadmap to Net Zero 2026

Annual Apparel Sector Greenhouse Gas Emissions: Calendar Year 2024

apparel impact institute

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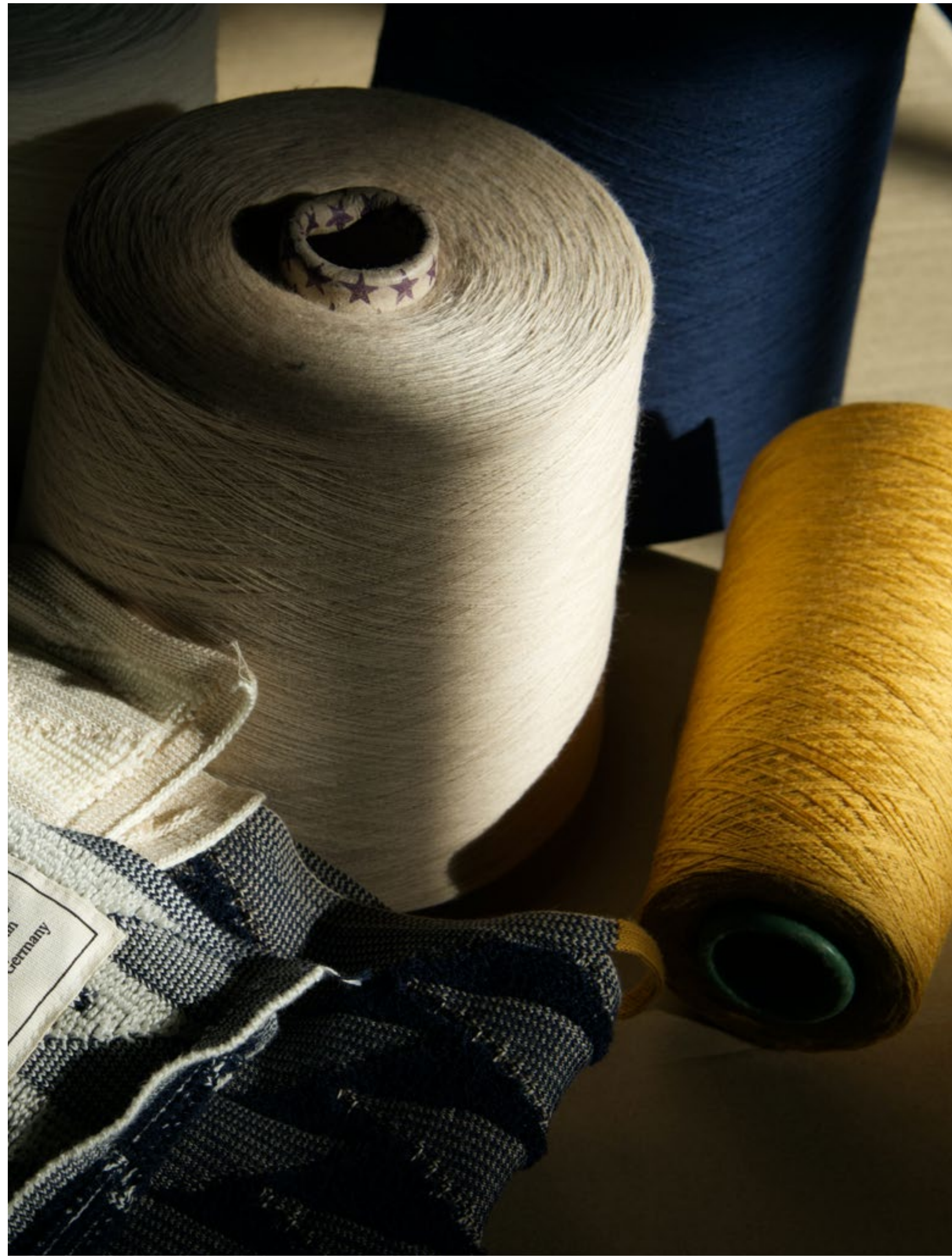
Content

1. Executive Summary

According to the IEA, energy-related CO_2 emissions reached a record 38.4 billion tonnes (Gt) in 2025. This coincided with record atmospheric CO_2 concentrations of approximately 427 parts per million (ppm), about 50% above pre-industrial levels. As CO_2 continues to build in the atmosphere, the impacts of climate change are becoming more severe, with 2015 to 2025 being the hottest 11 years on record.

Yet, annual emissions growth is slowing, down 0.4% from 2024, well below global economic growth, pointing to a continued decoupling of emissions from economic activity. We are also seeing a significant shift in energy systems globally. According to clean energy think tank Ember, clean energy sources covered all new electricity demand growth globally in 2025, thanks in large part to solar (30% year-over-year growth). The world now has more solar electricity capacity than coal generation capacity. And, innovation in clean technology continues at a brisk pace. For example, one in four cars sold globally in 2025 was an electric vehicle.

The apparel sector has also exhibited mixed results: in 2024, apparel sector emissions increased 6.3% from the previous year to 1 gigatonne. This was mainly driven by an increase in the amount of fiber used to produce apparel, particularly polyester. According to Textile Exchange, global fiber production increased from roughly 125 million tonnes in 2023 to a record 132 million tonnes in 2024, with polyester accounting for 59% of this figure. Decarbonizing apparel therefore requires action on both sides of the equation: reducing the carbon intensity of material production and manufacturing, while also addressing the growth in material volumes that can outpace those gains. As with previous years, Tier 2 - textile processing - remains the largest share of emissions, at 51%, followed by raw material production (26%).



This said, we are also seeing meaningful progress across the sector and within individual companies. In 2024, H&M became the first apparel company to sign a memorandum of understanding for a Direct Power Purchase Agreement (DPPA) in Vietnam - a policy intervention that was many years in the making. This will allow other apparel brands and manufacturers to deploy renewable electricity at scale in this key sourcing country. Brands and manufacturers continue to work together to phase out coal in textile mills and finished goods production. A growing number of brands have made significant shifts to recycled polyester and other sustainable materials, and there has been robust investment from brands and governments to support next-generation materials such as textile recycled fibers.

As with the prior Roadmap to Net Zero reports, Aii has published this update to take stock of progress on decarbonizing the apparel sector and highlight examples that demonstrate what is possible and where the sector must now accelerate implementation at scale. Our goal with this report is to connect the evidence to practical, measurable action: showing where facility-level emissions reductions are possible while making clear how material and production decisions shape the scale of the challenge.

We welcome your feedback on the report. Please send any comments to Impact@apparelimpact.org.

Connecting Evidence to Action

We've identified four priorities for moving from isolated examples to sector-wide scale. Throughout the report, callout boxes highlight where each is needed and where it is already being put into practice. More detail is available in the Call to Action section at the end of the report.

1. **Move from commitments to facility-level implementation**
2. **Finance and enable supplier action**
3. **Measure, replicate, and scale what works**
4. **Deliver absolute emissions reductions while addressing production growth**

2. Context

Since the publication of Roadmap to Net Zero: Delivering Science-Based Targets in the Apparel Sector in 2021, Apparel Impact Institute has produced annual estimates of greenhouse gas (GHG) emissions for the apparel sector. Through these annual updates, Aii aims to help the industry track progress toward its collective goal of reducing emissions 45% by 2030, from 2019 levels. This is the trajectory needed to limit the most severe impacts of climate change. We also use these updates to highlight leading practices that show what is possible and identify where the industry must accelerate implementation to move from ambition to measurable action.

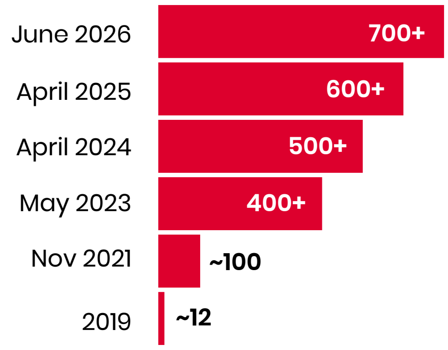
Given our data sources, there is a lag between the emissions estimate and report publication. This report, published in 2026, is based on 2024 data. As with prior versions, we have used fiber volume data from Textile Exchange (2024 for this report) and GHG impact data from the Higg Material Sustainability Index (MSI), a product of Cascale and Worldly. These data sources are the most widely used and representative in the apparel sector, and Aii has used them in both the original Roadmap and the subsequent updates. The benefits and limitations of these data sources are outlined in the original Roadmap report.

Table 1: Publications of Apparel Sector Emissions

Report	Publication Date	Data Year
Roadmap to Net Zero: Delivering Science-Based Targets in the Apparel Sector	November 2021	2019
Taking Stock of Progress Against the Roadmap to Net Zero	June 2023	2021
Taking Stock of Progress Against the Roadmap to Net Zero 2024	June 2024	2022
Taking Stock of Progress Against the Roadmap to Net Zero 2025	July 2025	2023
Taking Stock of Progress Against the Roadmap to Net Zero 2026	September 2026	2024

Update on Science-Based Targets in the Apparel Sector

Since the inaugural report, we have tracked the number of apparel, footwear, and textiles companies that have approved science-based targets or commitments to set them (via the Science-Based Targets initiative). This number has risen substantially since 2019, when the SBTi published guidance for the apparel sector.[1]



[1] We approximate these figures as the SBTi has two sectors in which apparel companies are included, 1) Retailing and 2) Textiles, Apparel, Footwear, and Luxury Goods. The Retailing sector includes a wide variety of retailers, many of which are not apparel related, and so we have tried to identify those companies which are predominantly apparel retailers (e.g., H&M).

3. Methodology

For the 2024 analysis, Aii used the same approach as in previous reports. We started with fiber weight data from Textile Exchange's *Materials Market Report 2025* (published in September 2025), which covers global 2024 production weights for fibers and materials used in textiles.[2] For each fiber type, we used Textile Exchange's assumptions on the share used in apparel versus other categories, such as home textiles, as shown in Table 2.

For each fiber type, we multiplied the allocated total fiber weight by the GHG emissions factors for each process stage in the MSI:

- Raw material, such as cotton farming to gin
- Yarn formation, or spinning fiber into yarn
- Textile formation, such as knitting or weaving yarn into fabric
- Preparation, such as scouring
- Coloration
- Additional coloration and finishing, including heat setting

Table 2: Fiber Allocation to Apparel

Fiber	Percentage Allocation to Apparel
Cotton	70%
Wool	45%
Down	25%
Viscose	50%
Lyocell	50%
Modal	50%
Polyester	55%
Nylon	46%
Acrylic	75%
Elastane	67%
Polypropylene	67%
Hemp	1%
Flax	60%
Silk	90%
Alpaca	95%
Jute	1%
Acetate	5%

[2] We use "weight" for consistency with previous reports. Textile Exchange uses "volume" in their *Materials Market* reports - these terms are synonymous for the purposes of the calculations.

Since the MSI does not include data on finished goods production (Tier 1), we used a simplified process from Quantis' World Apparel & Footwear Life Cycle Assessment Database (WALDB) as a proxy. As with the previous reports, we excluded emissions from the following sources because they are minimal and/or difficult to estimate. See the Roadmap and subsequent reports for further explanation.

- Corporate offices and other buildings
- Consumer use
- End of life
- Downstream transportation

We used refreshed MSI data in our calculations. Details are available in the last change log, Version 3.12 (May 2026). Some notable revisions since last year's analysis include:

- Updated background for electricity grid, affecting all processes but especially those that rely heavily on electricity (yarn spinning and textile formation)
- Updated background for feedstock processes and mix to China for various synthetics, including polyester, nylon, and polypropylene
- Updated heat setting model boundaries and data for preparation and finishing

3.1 Definition of Tiers and Assumptions

3.1.1 Raw Material Extraction

Scope: Emissions related to extracting fossil fuels for conversion into synthetic fibers and growing natural fibers such as cotton and wool.

According to the Materials Market Report 2025, 132 million tonnes of fiber were produced in 2024, up from 124 million tonnes in 2023. Based on the fiber percentage allocations shown in Table 2, the starting point for fiber used in apparel was 72.178 million tonnes.

Polyester was the most used fiber type in 2024, representing 59% of total global fiber production. Cotton (in all formats) was second at 19%, followed by man-made cellulosic fibers (MMCF) at 6%, and nylon at 5%.

For the Tier 4 figure, we multiplied the weights of each fiber type by the corresponding emissions factor from the MSI and summed them.

3.1.2 Raw Material Processing

Scope: Spinning fiber into yarn

Our analysis focused on spinning fibers into yarn and did not include the processing of other intermediate materials, such as metal for zippers, as that data is not readily available. Our goal is to include more of these trims and other inputs in future analyses.

We made the following assumptions for converting fiber into yarn:

Table 3: Assumptions for Yarn Types

Fiber	Assumptions
Polyester	67% filament yarn 33% staple fiber ring-spun yarn
Nylon	90% filament yarn 10% staple fiber ring-spun yarn
Polypropylene	60% filament yarn 40% staple fiber ring-spun yarn
Acrylic	100% staple fiber ring-spun yarn
MMCF (Viscose Rayon, Modal, Lyocell)	100% staple fiber ring-spun yarn
Cotton	75% staple fiber ring-spun yarn 25% staple fiber rotor-spun yarn
Wool	100% staple fiber ring-spun yarn

We assumed a yarn density of 200 decitex for all fiber types and used the same fiber loss rates as in previous reports.

3.1.3 Material Production

Scope: Textile formation, preparation, coloration, and additional coloration and finishing.

Our analysis for Tier 2 included:

- Textile formation (knitting or weaving yarn into fabric)
- Preparation, such as scouring
- Coloration
- Additional coloration and finishing, such as heat setting

We assumed 40% knit and 60% woven split across all fiber types during textile formation. During preparation, we applied default MSI emissions factors by fiber type. The sources for these emissions factors can be found in the public version of the MSI. For coloration, we again applied the default MSI emissions factors by fiber type:

- Synthetic fibers: Batch dyeing with disperse or cationic dyes
- Cotton and MMCF fibers: Batch dyeing with direct, sulfur, vat, or reactive dyes
- Wool: Batch dyeing with acid dyes

Companies wanting to refine their analysis can select specific coloration methods in the MSI.

Calculations use fiber loss rates from the MSI (via Textile Exchange) for Tiers 2 and 3.

3.1.4 Finished Goods Manufacturing

Scope: Final assembly of products, including cutting and sewing of fabric into garments.

We calculated emissions for manufacturing finished goods using a standard emission factor per kilogram of finished product, based on data from Quantis' WALDB. The process includes GHG impacts from electricity consumption (80% of the GHG impact), thermal energy, and minor sources such as tap water. Calculations used the electricity mix representing the top apparel manufacturing countries, which is consistent with the MSI.

In our calculations, we assumed an average fabric loss rate of 20% for finished goods.

Together, these calculations provide a consistent view of how emissions are distributed across the apparel value chain, helping to identify where sector-wide decarbonization efforts could have the greatest impact.

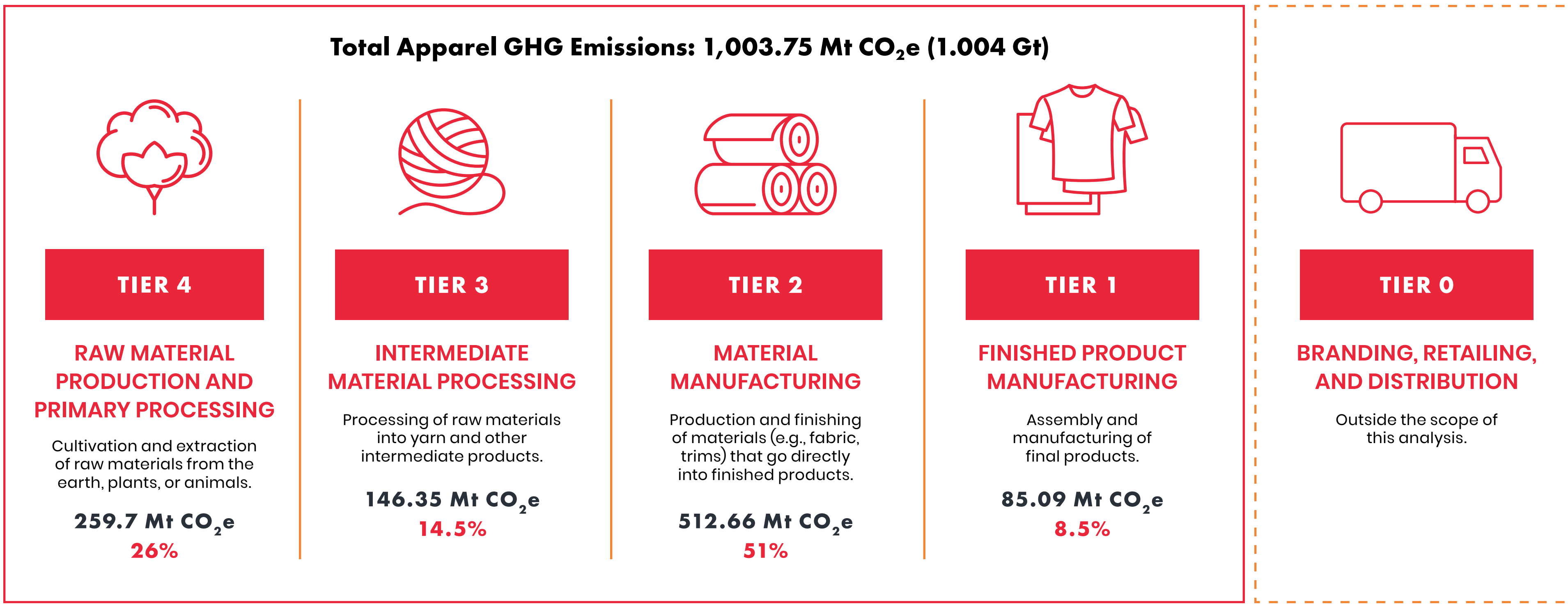
4. Results

Given the above assumptions, we estimated total apparel sector GHG emissions for 2024 to be 1,003.75 Mt CO_2e, or 1.004 Gt. This is an increase of 6.3% from 2023, with an increase in fiber consumption, particularly polyester, as the major driver.

Based on global annual GHG emissions of 53.2 Gt[3], the apparel sector's 2024 figure represents 1.89% of global emissions.

The percentage breakdown of emissions across the value chain was approximately the same as in 2023, as illustrated in Figure 1.[4]

Figure 1: Emissions Breakdown Across Tiers, 2024



Note: 1 million tonnes = 1 megatonne (Mt), 1 billion tonnes = 1 gigatonne (Gt)

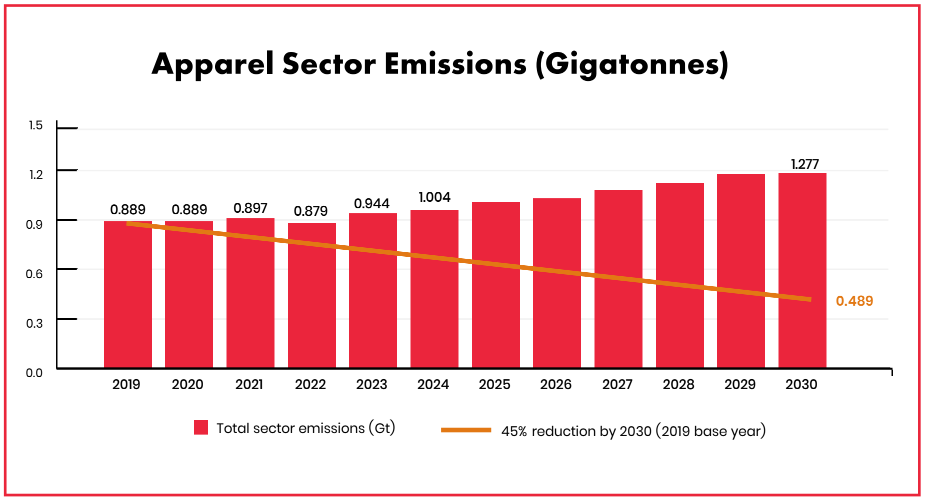
[3] Source: EDGAR - Emissions Database for Global Atmospheric Research (2024 data)

[4] This value chain segmentation is consistent with that of the Supply Chain Taxonomy for the Textile, Apparel, and Fashion Industry.

As noted in our previous reports, apparel sector impact data is still limited. Our result (1.004 Gt) is a reasonable but not definitive estimate of apparel sector emissions. We will continue to refine the calculation as data improves, as we did this year with data on Chinese polyester production.

Assuming business-as-usual growth for the sector, emissions are projected to be 1.277 Gt in 2030. This reflects annual growth rates of 5% for synthetics and MMCF and 1% for cotton and other natural fibers.[5] To stay within a 1.5°C trajectory — achieving a 45% reduction by 2030 — the sector would need to reduce emissions from 1.004 Gt in 2024 to 0.489 Gt by 2030 - and more if we are to achieve net zero by no later than 2050.

Figure 2: Historical and Projected Emissions for the Apparel Sector



The widening gap between the business-as-usual projection and the 2030 target makes clear that targets alone will not change the sector's emissions trajectory. Progress now depends on accelerating the deployment of decarbonization projects: converting transition plans into a pipeline of funded projects focused on the production stages with the greatest emissions impact, and measuring their contribution to absolute emissions reductions. The following sections highlight examples of how companies and industry initiatives are beginning to put key decarbonization interventions into practice, demonstrating where proven approaches can be scaled.

[5] We used the same growth assumptions in previous reports.

5. Slow Industry Progress but Glimmers of Hope

With 2030 fast approaching, it is discouraging to see apparel sector emissions rise 6.3%, marking the second consecutive year of growth. This increase is a result of increased fiber use in apparel production, with polyester taking a growing share as noted above. While our methodology uses overall fiber production and not that of any particular segment of the sector, the growth of ultra-fast fashion is likely a contributing factor.

This finding underscores an important decarbonization reality: efficiency, renewable energy, and cleaner production are essential, but their emissions benefits can be eroded when the volume of carbon-intensive material production continues to grow.

The barriers identified in the original Roadmap and subsequent reports remain relevant, namely:

- Limited access to finance for manufacturers to invest in solutions such as energy efficiency and renewable energy.
- Brand buying practices do not incentivize long-term thinking and investment by manufacturers.
- Renewable electricity and low-carbon alternatives to coal for thermal energy may not be available and/or cost-effective in key manufacturing countries.
- Available sustainable materials options, such as recycled polyester and cotton, may cost more and not meet the quality of conventional alternatives.
- Promising next-generation materials, such as textile-recycled fiber, continue to face similar cost and quality hurdles to today's sustainable materials.
- Circular business models such as rental, resale, and repair generally remain niche, despite the growing number of brand programs that exist. This is perhaps the most important intervention to reduce production.

While these systemic challenges remain, leading brands and manufacturers are demonstrating that absolute emissions reductions are possible. The following examples provide evidence of progress while underscoring the need to translate isolated successes into implementation at a much greater scale across the sector.

PRIORITY ACTION IN PRACTICE
4. Deliver absolute emissions reductions while addressing production growth

BRANDS AND RETAILERS

Fast Retailing reduced purchased goods and services emissions from the manufacture of raw materials, fabric, and garments for UNIQLO and GU products by 18.6% from FY2019 to FY2024. The company also raised its FY2030 reduction target to 30%.

Gap Inc. reduced purchased goods and services emissions by 20% in FY2025 compared with 2017, with a 7.4% year-on-year reduction.

H&M Group reduced Scope 3 emissions by 34.6% from 2019 to 2025, with a 13.6% year-on-year reduction.

HUGO BOSS reduced purchased goods and services and upstream transportation and distribution emissions by 15% in 2025 compared with its 2024 baseline.

Inditex reduced purchased goods and services emissions by 16% from 2018 to FY2025, with an 8% year-on-year reduction. This progress was supported in part by 88% of fibers qualifying as lower-impact fibers, including 47% from recycled materials.

Ralph Lauren reduced Scope 3 emissions by 30.7% from FY2020 to FY2025, while purchased goods and services emissions declined 9.6% year-on-year.

MANUFACTURERS

Elevate Textiles reduced Scope 1 and 2 emissions by 33.3% from 2019 to 2024.

Far Eastern New Century Corporation reduced Scope 1 and 2 emissions by 34% from 2020 to 2024, with a 12.3% year-on-year reduction.

MAS Holdings reduced Scope 1 and 2 emissions by 24% from 2019 to 2024, with a 4.6% year-on-year reduction.

Shenzhou International Group Holdings reduced Scope 1 and 2 emissions by 16.8% from 2020 to 2024, with a 6.0% year-on-year reduction.

These companies face the same barriers as their sector peers, and so observing these absolute emissions reductions is a reason for optimism.

Below, we provide additional examples across the six interventions that we presented in the first *Roadmap* report.

CASE STUDIES

5.1. Case Studies in Decarbonization

Synflux

5.1.1. Maximizing material efficiency

Synflux is a Japan-based software company using AI-driven pattern optimization to reduce fabric waste at the design stage. Selected as the 2026 winner of Global Fashion Agenda's Trailblazer Programme, Synflux combines machine learning and 3D simulation to generate factory-ready pattern data while preserving design integrity. The technology, already tested with brands including The North Face, Issey Miyake, and doublet, is reported to reduce fabric use by up to 15%, helping lower material waste and associated emissions.

CASE STUDIES

5.1.2. Scaling sustainable materials and practices

While recycled material adoption remains uneven across the industry, several brands continue to report progress in replacing virgin inputs, particularly polyester, with recycled alternatives:

- In 2025, recycled materials represented 32% of H&M Group's total material use, up from 5.8% in 2020. This included 100% of all polyester and 12% of all cotton.
- In 2025, 47% of all materials used in Inditex products came from recycled sources, including 98% of all polyester and 21% of all cotton.
- Lululemon increased its use of recycled polyester to 77% in 2024, up from 61% in 2023.
- In 2024, PVH partnered with Unifi, Inc. to scale the use of REPREVE® recycled polyester fiber, helping divert more than 4.8 million post-consumer plastic bottles from landfills.

Beyond polyester, lower-carbon recycled material options are also emerging for footwear components. Cirql has published third-party life cycle assessments for its recycled TPU midsole materials, including Cirql rTPU50™, which shows a 39% reduction in total carbon footprint compared with a virgin TPU baseline.

Marks & Spencer has partnered with Pilio to launch the Affordable Clean Environment (ACE) Cotton program in India, an initiative designed to expand access to clean energy and support biodiverse farming practices in cotton-growing communities. The program builds on M&S's responsible cotton sourcing strategy and will unlock financing for on- and off-farm solar technologies. The goal is to reduce emissions associated with fossil energy use in cotton production while supporting farmers' livelihoods and rural resilience.

Cone Denim, part of Elevate Textiles, is advancing lower-impact denim through the adoption of COLOURizd™ in Forest Conservation, a fabric within the Cone Denim Community Collection. The technology, developed by COLOURizd LLC, enables a wide range of colors and textures while reducing processing steps in the dyeing stage, lowering the environmental impact of denim coloration. Compared with conventional dyeing, COLOURizd™ is reported to reduce energy use by 50%, water use by 98%, and the carbon footprint by 73% during the dyeing process.

CASE STUDIES

5.1.3. Accelerating the development of next-generation materials

Textile-to-textile recycling is beginning to move beyond pilots as brands, retailers, suppliers, and innovators make longer-term commercial commitments to scale the technology. Recent partnerships suggest growing industry momentum to convert textile waste into new material inputs and reduce reliance on virgin fibers:

- In February 2026, Circ announced the expansion of its Fiber Club to accelerate the development of its textile recycled material. New brand/retail partners include Madewell, Reformation, and C&A, and new supplier partners Lenzing and Linz Textil. These companies join existing members Bestseller, Eileen Fisher, Everlane, Zalando, Arvind, Birla Cellulose, and Foshan Chicley.
- Samsara Eco is working to scale enzymatic recycling technologies for materials including nylon 6,6 and polyester. In November 2025, the European Outdoor Group and Samsara Eco announced the Nylon Materials Collective, a collaborative platform to advance Samsara Eco's recycled nylon for outdoor products. Lululemon is also supporting Samsara Eco's scale-up through its ongoing materials innovation partnership.
- From 2024 through 2026, Syre announced several offtake agreements and partnerships to scale circular polyester production. These include H&M Group's agreement to purchase $600M of material over seven years and Nike's multi-year purchasing agreement in Vietnam. Other brands that have committed to purchases include Gap, Target, and Houdini.
- Ambercycle is building demand for cycora® regenerated polyester through brand, retailer, and supplier partnerships. In October 2025, REI agreed to a three-year offtake agreement with Ambercycle to help scale production. This follows earlier news of partnerships with fiber manufacturers including Highsun Holding Group and Zhejiang Huilong New Materials and brands/retailers such as Inditex, GANNI, and Arc'teryx.

Public funding and industrial policy are also creating the conditions needed to scale next-generation recycling technologies. In February 2025, the European Commission approved a €500 million French State aid scheme to support chemical recycling of plastic waste, including synthetic textiles containing polyester. France is also seeing industrial activity from innovators such as CARBIOS, which has received public funding through France 2030 and the Grand Est Region to support the construction of a PET biorecycling plant. Additionally, Reju has announced the development of industrial-scale textile recycling hubs in Lacq, France; Rochester, New York; and Sittard-Geleen, the Netherlands. Together, these developments highlight the role of public investment, policy support, and industrial infrastructure in moving textile recycling technologies beyond pilot stage.

CASE STUDIES

5.1.4. Maximizing energy efficiency

Brazil's textile sector provides a national-level example of how energy productivity improvements can support industrial growth while reducing energy-related emissions. According to data from the National Industry Observatory and the Brazilian Textile and Apparel Industry Association (ABIT), textile production increased by 18% between 2000 and 2024, while energy-related CO_2 emissions fell by more than 70%. Although Brazil is not a major global apparel manufacturing hub, the case highlights how modern machinery, improved production practices, electrification, and investments in energy-efficient technologies can decouple manufacturing growth from emissions.

MAS KREEDA, one of MAS Holdings' apparel manufacturing divisions, is reducing energy use through practical upgrades to factory utilities and engineering improvements. In 2024, the company improved compressed-air systems and lighting through several operational measures, including ongoing leak detection and repair, compressor-room heat reduction, separation of high- and low-pressure compressed-air needs, compressor-room reconfiguration, and digital lighting timers. Together, these measures are expected to save more than 300,000 kWh, or 1,000 GJ, each year, helping reduce manufacturing energy demand and supporting MAS Holdings' broader efforts to cut operational emissions.

Abit textile and apparel

MAS CHANGE IS COURAGE

CASE STUDIES

5.1.5. Eliminating coal in manufacturing

Several brands continue to report progress in identifying and phasing out on-site coal use across their manufacturing supply chains, particularly in Tier 1 and Tier 2 facilities where coal boilers remain a key source of thermal energy emissions:

H&M Group has reduced the number of Tier 1, 2, and 3 supplier factories using on-site coal boilers from 118 in 2022 to 10 at the end of 2025. H&M Group has committed to phase out all coal boilers in its supply chain by the end of 2026.

PUMA has committed to phasing out coal-fired boilers from its core Tier 1 and Tier 2 factories. In 2022, the company identified 21 factories with coal-fired boilers (by 2025, that number had fallen to 14 due to revisions in its core factory list). Of these, eight factories have phased out coal, four have partially replaced it, and two are planning transitions. Due to implementation challenges, four factories will extend their phase-out timelines to 2030.

Ralph Lauren set a 2025 goal to phase out on-site coal use at Tier 1 and Tier 2 manufacturing facilities. By the end of FY25, the company had identified and engaged with 80 on-site coal users globally. Of those, 66 had phased out on-site coal use, 13 were no longer active or in the process of deactivation, and just one active coal user remained.

Patagonia adopted a supply chain coal phase-out requirement in 2024, requiring suppliers to develop and share time-bound phase-out plans and preventing the onboarding of new suppliers that burn coal. The company is also funding a pilot project with a raw material supplier in Taiwan to replace a coal-fired steam boiler, covering 100% of the associated decarbonization costs through a legally binding multiyear agreement. The project is expected to reduce the facility's GHG emissions by approximately 27,500 tCO_2e per year, equivalent to a 30% reduction from its coal baseline.

PRIORITY ACTION IN PRACTICE
1. Move from commitments to facility-level implementation

CASE STUDIES

5.1.6. Shifting to 100% Renewable Electricity

Industrial heat pumps are gaining traction in textile and apparel manufacturing as an alternative to coal, biomass, and other fuel-based thermal energy. While deployment remains at an early stage, recent projects show how heat pump systems can support high-temperature processes such as laundry, dyeing, drying, and setting.

Epic Group has installed high-temperature electric heat pumps, described by the company as the world's first to power industrial laundry operations, at its apparel manufacturing hub in Bhubaneswar, India. Developed with TRIGeN Decarbonisation and Tonello, the system provides pressurized hot water at 130–135°C for adapted industrial dryers and is expected to displace 12,500 metric tons of CO_2 over its lifetime.

With support from an Aii Climate Solutions Portfolio grant, Zhejiang Bangjie Digital Knitting Share Co., Ltd. is installing the first steam-generating heat pump in Vietnam's textile and apparel sector. The project will replace coal and biomass for dyeing, drying, and setting operations, while integrating waste heat recovery, on-site solar generation, and a Direct Power Purchase Agreement. It is expected to reduce approximately 6,089 tCO_2e per year.

Beyond direct coal boiler phase-out, companies are also investing in electrified thermal energy systems that can reduce reliance on fossil fuel-based process heat. Lenzing, in collaboration with VERBUND, has commissioned a 14 MW power-to-heat facility at its industrial site in Austria to convert renewable electricity into process heat. Integrated into the site's existing heat network, the facility can use surplus wind and solar generation to supply thermal energy for industrial processes. By replacing fuel-based heat supply, the project supports Lenzing's transition toward fossil-free process heat while helping reduce renewable energy curtailment.

Finally, other initiatives include the Outdoor Industry Association's Clean Heat Impact CoLab - together with Cotopaxi, L.L.Bean, New Balance, Patagonia, REI Co-op, W.L. Gore & Associates, and Global Efficiency Intelligence - which launched the Textile Heating Electrification Tool to help textile mills transition away from coal and other fossil fuel-based heating systems toward efficient electric alternatives. The open-source tool translates clean heat research into practical guidance, including modeling, implementation checklists, and supplier identification features to support manufacturers in assessing lower-carbon thermal energy solutions.

PRIORITY ACTION IN PRACTICE
3. Measure, replicate, and scale what works

CASE STUDIES

Several brands continue to report progress in increasing renewable energy use across owned operations and manufacturing supply chains:

In 2025, roughly 33% of the energy used by PUMA's core factories (Tier 1 and Tier 2 manufacturing partners representing approximately 60 to 80% of total sourcing volume and significant future business growth potential) came from renewable sources, exceeding its 2025 target of 25%. PUMA's 2030 target is 40%.

In FY25/26, roughly 44% of total electricity consumed by Burberry's direct Tier 1 suppliers came from renewable sources.

W. L. Gore increased the share of renewable electricity in its manufacturing operations from 44% in 2023 to 75% in 2024. This figure applies to Gore-owned manufacturing plants across its global materials-science businesses, including Fabrics, Medical, Performance Solutions, and Specialty.

Alongside these initiatives, apparel and textile manufacturers are also demonstrating how renewable electricity can be scaled across production sites.

Elevate Textiles' Cone Denim Jiaxing facility installed a 9 MW rooftop solar system expected to generate 8.2 million kWh per year and reduce emissions by 5,500 tCO_2e annually. A&E Gütermann India installed a 455 kW solar system generating 30% of the plant's electricity.

MAS Holdings transitioned all its Sri Lankan facilities to solar net metering in 2024, allowing excess solar generation to feed into the grid and supporting emissions reductions through increased solar use.

Shenzhou International Group Holdings reported that renewable electricity accounted for more than 60% of total electricity consumption in 2024, with 10 factories powered by 100% renewable electricity and 112.4 MW of solar PV capacity generating more than 100,000 MWh of self-consumed electricity.

Far Eastern New Century Corporation also expanded renewable electricity use across its production network, with 12 sites in Taiwan, mainland China and Vietnam equipped with solar power systems by the end of 2024, generating 24.06 GWh of solar power for self-use. Together with around 200 GWh of purchased renewable electricity, the company reduced emissions by 110,908 tCO_2e.

CASE STUDIES

Brands are also working to expand access to renewable electricity in key manufacturing regions. In November 2024, H&M Group became the first apparel company to sign a memorandum of understanding for a Direct Power Purchase Agreement in Vietnam, creating a pathway for large-scale renewable electricity procurement in one of the sector's major sourcing countries.

Marks & Spencer and Schneider Electric are partnering on RE: Spark, a program designed to accelerate renewable energy adoption among M&S suppliers. The program also provides tools and support for tracking GHG emissions and implementing energy efficiency measures, enabling suppliers to identify and act on opportunities to reduce energy-related emissions.

Financing is also supporting renewable energy deployment at the facility level. The Asian Development Bank signed a $30 million sustainability-linked loan with Envoy Textiles Limited in Bangladesh to support construction of a new yarn spinning unit and installation of 3.5 MWp of rooftop solar capacity at the factory. The project illustrates how sustainable finance can help manufacturers invest in lower-carbon production infrastructure.

PRIORITY ACTION IN PRACTICE

2. Finance and enable supplier action

5.2. Moving From Examples to Scale

Taken together, these examples point to a clear conclusion: the sector is not starting from zero. Across material efficiency, lower-impact and next-generation materials, energy efficiency, coal phase-out, clean heat, and renewable electricity, companies are testing and deploying interventions that can reduce emissions. The evidence shows that implementation is possible and, in several areas, is already delivering measurable results. It also demonstrates that progress can take different forms, from facility upgrades and technology deployment to long-term purchasing agreements, public investment, and policy mechanisms that expand access to renewable energy.

What remains missing is scale. Most of these examples are still limited to individual facilities, companies, or markets, while overall sector emissions continue to rise. Moving from isolated progress to sector-wide impact will require transition plans to become coordinated investment and implementation supported by long-term brand-manufacturer partnerships, accessible finance, enabling policy and infrastructure, and consistent measurement of outcomes.

CALL TO ACTION ▶

CALL TO ACTION

We've identified four actions as particularly important to move from isolated progress to coordinated, financed, and measurable implementation at scale:

1 Move from commitments to facility-level implementation

Climate targets and transition plans must be translated into specific projects at the facilities and production stages with the greatest emissions impact, particularly energy- and heat-intensive processes in Tier 2.

This means moving beyond broad targets and isolated pilots toward clearly defined project pipelines with implementation timelines, investment requirements, expected emissions reductions, and accountable project owners. Coal phase-out, thermal electrification, renewable electricity, energy efficiency, and other interventions should be planned together as part of an integrated facility-level transition.

2 Finance and enable supplier action

Supplier action requires brands, financial institutions, policymakers, and implementation partners to share the financial and operational burden of supply chain decarbonization.

This includes improving access to appropriate finance, sharing project costs and risks, providing stable and longer-term purchasing commitments, and aligning commercial relationships with decarbonization objectives. Supplier engagement must also move beyond data collection and training toward the co-development, financing, and delivery of practical projects.

3 Measure, replicate, and scale what works

Consistent measurement, supported by clear baselines and post-implementation monitoring, is essential to verify project performance and its contribution to absolute sector emissions reductions.

Sharing credible results, implementation lessons, and project economics can help reduce uncertainty and support replication across facilities, companies, and manufacturing regions. The measure of progress should increasingly be not only the number of targets or commitments announced, but the number of effective interventions financed, implemented, verified, and scaled.

The sector has identified many of the interventions required to reduce emissions, and the examples in this report show that implementation is already underway. The next phase of progress depends on making these interventions standard practice rather than isolated examples, and deploying them at the speed and scale required to change the sector's emissions trajectory.

4 Deliver absolute emissions reductions while addressing production growth

Improvements in materials, energy efficiency, and manufacturing carbon intensity must deliver absolute reductions, not simply offset the impact of continued production growth.

This requires maximizing material efficiency, reducing production waste, increasing the use of lower-impact materials, and supporting next-generation materials as they move toward commercial scale. Circular business models such as rental, resale, and repair can also contribute where they demonstrably displace the production of new products. These interventions should advance alongside, not replace, the rapid decarbonization of manufacturing.