

The background of the entire page is a vibrant, microscopic image showing various cells and structures in shades of green, yellow, orange, red, and purple. The cells vary in size and shape, some appearing as large, rounded structures with internal details, while others are smaller and more spherical. The overall effect is a dense, colorful field of biological activity.

THE FASHION INNOVATION OVERVIEW 2025

A COMPREHENSIVE VIEW
FROM THE CENTRE

TABLE OF CONTENTS

Introduction

- 1. A data-deficient diet**
- 2. The problem with solving problems**
- 3. Material innovation comes at a cost (but only until scale tips the balance)**
- 4. We need to sort it out!**
- 5. The backbone is buckling: suppliers' analysis-paralysis**

Glossary



INTRODUCTION

Looking around the room at our Fashion for Good Innovation Fest in October 2025, filled with brands, manufacturers, innovators, and financiers, one thing was clear: this community refuses to step back when the road gets rough. And rough it has been. Across industries, we've seen leaders retreat from commitments made just a few years ago. **Yet progress doesn't stop because agendas shift, and it's the people who push forward who keep the industry moving.**

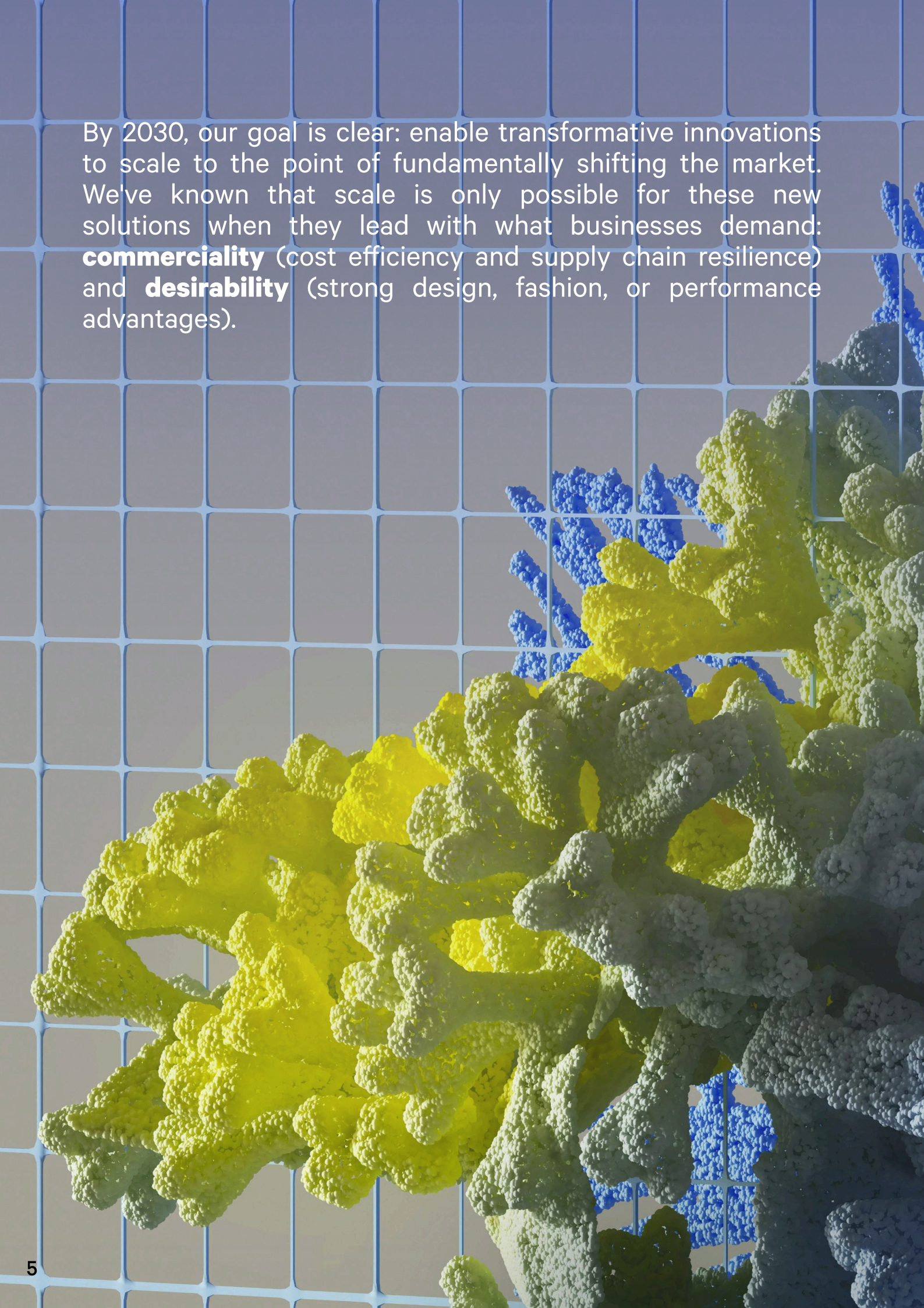
WHAT GIVES US HOPE?

Small ripples creating big waves: that is the nature of innovation. Each breakthrough demonstrates what's possible, attracts investment, and scales impact. Sitting **at the centre of the fashion ecosystem**, we translate what innovators need to scale, what investors need to commit, what brands need to adopt, and what the industry needs to transform.

From supporting over **193 innovators** to validating their technologies through countless collaborative projects, Fashion for Good has moved beyond theory to results that are already making a difference in the industry. Today, **43% of our innovations have reached Technology Readiness Level 8 or beyond¹**, with digital solutions already commercially viable. What once existed only in laboratories is now reshaping markets, and this shift from experimentation to adoption is visible across the industry.

Our work is done in partnership with over 17% of the industry: not just early adopters, but pioneers showing that innovation creates competitive advantage. When we look through a broader lens, more than **20% of the industry has implemented technologies from our portfolio**, moving innovation into mainstream adoption. And, most importantly, **capital is following: a network of over 300 investors has channelled more than €2.5 billion** into Fashion for Good innovators.

¹ Built on a nine-level scale that measures the maturity of a technology, TRL 8 is the stage at which a technology has been demonstrated and qualified in its final form under expected operational conditions, indicating readiness for implementation or commercialisation. Link [here](#).



By 2030, our goal is clear: enable transformative innovations to scale to the point of fundamentally shifting the market. We've known that scale is only possible for these new solutions when they lead with what businesses demand: **commerciality** (cost efficiency and supply chain resilience) and **desirability** (strong design, fashion, or performance advantages).

The challenges outlined here aren't abstract: they're the precise **friction points** where new technologies stall, capital hesitates, and transformation slows. But each barrier also reveals its own solution: the data platforms, standardisation efforts, demand pooling mechanisms, infrastructure initiatives, and supplier partnerships that are already breaking the gridlock.

What we've learned is that systemic change doesn't happen through isolated interventions, but through coordinated action across all key actors. **The initiatives mapped here represent that coordination in practice: turning fragmented efforts into collective momentum.** The question isn't whether transformation is possible, but whether enough players are willing to move from observer to participant.

A DATA- DEFICIENT DIET

For an industry built on visibility, where every runway look gets archived and trends documented, it's striking that **we don't have an equivalent data repository that could guide our decision-making process** when it comes to environmental impact and the potential of innovative technologies.

01.

A DATA-DEFICIENT DIET

This isn't because the research doesn't exist: studies on material impacts, process emissions, and supply chain footprints are being conducted constantly by universities, consultancies, material suppliers, and brands themselves.

The problem is that all this knowledge is scattered: one study sits in an academic journal, another lives in a consulting firm's archives, and a third exists as an internal brand report that can not be shared externally. When someone needs to make a decision about which innovation has a lower water footprint or which production method generates less waste, they can't simply look it up, but they have to hunt through disparate sources, each presenting information differently, each potentially contradicting the others.

This is impacting the industry massively. Take, for instance, **waste:** there's a wealth of data on textile waste volumes, composition, and recycling potential, but it's fragmented across reports, databases, and platforms, often behind paywalls or buried in dense technical language. The result is that **while information exists, it's rarely accessible in a single, practical place, freely available for those who need it most.** Without clear, consolidated data, making truly informed decisions sometimes might feel like a guessing game.

ADDRESSING THE CHALLENGE

Advanced Processing Matrix

Challenge

Fashion lacks consolidated, reliable, real-world data on the environmental impact of dyeing and finishing processes at scale. Real-time factory floor data is critical for validating the true potential of these technologies to decarbonise the supply chain and reduce the use of other resources such as water and chemicals.

How?

The Advanced Processing Matrix maps and compares processing technologies across suppliers to identify low-impact options based on industrial-scale data by:

- Conducting industrial-scale assessments of processing innovations across Tier 2 steps (pretreatment, colouration, finishing).
- Building a living database that compares innovations and conventional technologies based on technical, environmental, and performance metrics.

Impact Database

Challenge

Fashion for Good innovators have made their LCAs available, but the information remains fragmented, making it challenging to make fully informed decisions.

How?

- Creates a comprehensive innovator database, including detailed data from projects and pilots through Fashion for Good initiatives.
- It combines external LCAs by independent third parties and internal LCAs by Fashion for Good.
- The impact database is accessible to FFG partners only.

World of Waste

Challenge

Various organisations have published studies reporting on textile waste, but there exists a gap in access to aggregated knowledge that enables the identification, comparison, and utilisation of textile waste hotspots

How?

- World of Waste is an online tool mapping global textile waste hotspots, providing insights into individual countries through aggregated data. The tool is accessible for free.
- It consolidates textile waste data across various research projects and organisations, highlighting completed and ongoing waste mapping activities, methodologies, types and composition of waste.

Dyestuff Library

Challenge

Fragmented and inconsistent availability of environmental impact data across the landscape of alternative dyestuff innovations. There is a notable lack of standardised Life Cycle Assessment (LCA) data and third-party verified performance metrics for many solutions.

How?

It tests and evaluates bio-based dyes in real manufacturing settings to generate performance and impact data at scale.

- It creates a sustainable dye library with key performance metrics including feedstock, pigment, application, scalability, TRL, capacity, price, impact and trial results.
- Through the library, it creates a decision framework tool that will enable partners to choose the best-suited dyestuff for their requirements.

THE PROBLEM WITH SOLVING PROBLEMS

Many companies are tackling what they perceive to be "the sustainability problem", but these perceptions rarely align. The result? **An industry where everyone is working hard, but where working together matters most.**

02.

THE PROBLEM WITH SOLVING PROBLEMS

The reality is that **we can't fix what we can't agree on.** While some areas have established standards and shared frameworks, many parts of the industry are still pouring resources into solutions without first agreeing on what the root causes of longstanding challenges are. Individual brands are innovating, but their breakthroughs often stay siloed. In too many cases, there's no shared language to capture lessons learned, nor common metrics to prove what works. Without agreement on the root causes, we're stuck treating symptoms rather than focusing on addressing the underlying problem.

The real barrier isn't lack of effort or even lack of innovation. It's that we're all working from different perspectives, measuring different things, and calling the same issues by different names. When we can't agree on what the problem actually is (its scope, its root causes, its most critical intervention points), **we fragment our efforts** across disconnected initiatives that never accumulate into systemic change.



Take, for instance, the phenomenon of **fibre fragmentation**: even just the lack of standardised definitions and the specifications included within them (such as size and fibre type) has hindered collective action by creating ambiguity. The common term “**microfibre**” is often used in environmental studies to describe tiny plastic particles, yet it clashes with existing textile terminology that refers to very fine synthetic yarns with diameters of 1 dtex or less.

In a similar way, the term “**microplastic**” is often reductive, since it only applies to synthetic fibres, limiting consideration of the potential impact of all fibre types, both natural and synthetic. As a result, the overall presence of fibre fragments has been underestimated, and data across studies remain difficult to compare.

This ambiguity limits researchers and industry stakeholders from understanding the true extent of the problem, designing effective interventions and tracking progress.²

² Built on a nine-level scale that measures the maturity of a technology, TRL 8 is the stage at which a technology has been demonstrated and qualified in its final form under expected operational conditions, indicating readiness for implementation or commercialisation. Link [here](#).

ADDRESSING THE CHALLENGE

Behind the Break

Challenge

There is a lack of comprehensive understanding and standardisation around textile fibre fragmentation during manufacturing. Without clear insights into the root causes of fibre shedding, and with existing test methods unreliable or inconsistent, brands and manufacturers cannot effectively design mitigation strategies.

How?

- It develops industry-aligned testing protocols to measure fibre fragmentation across material types and production processes.
- It builds a shared data foundation for comparing and reducing microfibre release across the value chain.
- It aligns brands, suppliers, and innovators around common metrics to support collective action and regulatory preparedness. It helps transform scattered research into scalable, standardised solutions to reduce fibre pollution at source.

Closing the Footwear Loop

Challenge

The lack of unified guidelines for circular design and infrastructure in footwear is hindering its recyclability and journey to circularity.

How?

It establish a comprehensive roadmap for circular footwear design, including the development of guidelines to promote design for disassembly and criteria for circular and safe inputs and materials, recyclability, durability and repairability.

Tracing Textile Waste

Challenge

Tracing textile waste is currently a manual and fragmented process, with data collected not being classified and standardised efficiently for consolidation and exchange.

How?

- It standardise the labelling and classification of data points for Material Declaration Forms (MDFs) and Transaction Certificates.
- It tests the exchange of RMDF data (not API integration) between key stakeholders in multi-stakeholder pilots.
- It recommends an industry framework (based on MDF open data standard) for the first data input of textile waste feedstock for certified recycled materials, particularly for GRS & RCS certification improvements.

Proof point: Textile Exchange, a project partner of Tracing Textile Waste, has updated its RMDF and designed it to gather, standardise, and categorise information on both textile and non-textile waste.

From Waste to Black Pigment

Challenge

The lack of unified guidelines for circular design and infrastructure in footwear is hindering its recyclability and journey to circularity.

How?

- It tests black pigments made from waste and renewable feedstocks (like industrial carbon, algae, wood) in textile production, ensuring they can be used for fibre-level dyeing, not just for surface printing.
- It validates performance benchmarks (colourfastness, durability, opacity, process compatibility) so these bio-based pigments can viably replace traditional petrochemical black dyes in mainstream manufacturing.

Feedstock Assessment for Biosynthetic Innovation


Challenge

There is a lack of a clear, shared understanding of the sustainability impacts of biobased synthetics. With diverse feedstocks and production methods, the environmental and social effects vary significantly, making it difficult for brands to make informed material choices, with traditional LCA tools often fall short in capturing broader issues like land use, biodiversity, and end-of-life scenarios.

How?

- It builds robust, harmonised evaluation frameworks to enable more accurate, context-specific comparisons and support informed decision-making across the fashion value chain.
- It evaluates sustainable feedstocks and technologies to guide brands on lower-impact alternatives to fossil-based synthetics. Identifying feedstocks that are scalable and compatible with current manufacturing processes.
- It ensures all feedstocks meet the standards and certificates expected by both consumers and policymakers for ethical, social and low environmental impact materials.





MATERIAL INNOVATION COMES AT A COST (but only until scale tips the balance)

Promising new innovations get stuck in development limbo, caught between high development costs and the low prices of established alternatives. **Traditional materials benefit from massive economies of scale built over decades,** complete with optimised supply chains, proven performance, and competitive prices that innovative alternatives can't yet match.

03.

MATERIAL INNOVATION COMES AT A COST

Take Spandex, for example: this petroleum-based fibre dominates activewear, denim, and underwear thanks to decades of performance testing, global availability, and extreme cost efficiency, often as low as \$5 per kilogram. **Even if a bio-based or recycled fibre can match or exceed its performance, it often costs several times more**, and even though some brands are beginning to adopt innovative fibres³, most hesitate to absorb that premium.

But the challenge runs deeper than price: many new materials aren't direct substitutes at all. In fact, the hesitation isn't just always about cost, but it's about compatibility and performance gaps that many innovative materials or technologies haven't fully solved yet.

These **aren't always direct substitutes for existing materials**; they're often different solutions that require brands to rethink their entire approach from product development, supply chain management, and consumer communication. A mycelium-based material, for instance, is not a direct substitute for cow leather: it offers an alternative, and as such, it demands different manufacturing processes, different quality control standards, and fresh consumer education strategies.

³ Ken Research. (2024). Global Spandex Fibres Market Outlook 2030. Available [here](#).

This creates a chicken-and-egg problem: material developers can't achieve the scale needed to reduce costs without longer-term demand signals and commitments from brands, while brands won't commit without competitive prices and proven performance.

Financing adds another layer of complexity, **as each innovation maturity phase requires completely different types of capital that often don't align with available funding mechanisms.**

Early-stage material innovations need risk-tolerant venture capital for R&D and proof-of-concept work, while scaling requires patient infrastructure investment focused on manufacturing capacity and supply chain development. But most investors want either quick returns from early-stage breakthroughs or predictable yields from established operations, **leaving a critical funding gap in the middle stages** where promising technologies get stranded between prototype and commercial viability.

ADDRESSING THE CHALLENGE

Scaling Next-Gen Materials In Fashion: An Executive Guide

Challenge

Leaders often lack a clear, actionable strategy for investing in and scaling innovation. This creates a leadership gap where bold ideas are discussed but not implemented, especially when cost and risk are perceived as barriers.

How?

- It provides leaders with a strategic framework to address the key levers of demand, cost, and capital to bend the adoption curve, with individual actions and collective levers
- It helps brands move from ambition to action, aligning sustainability targets with concrete investment and adoption plans.
- It encourages long-term thinking and risk-tolerant leadership, essential to break free from short-termism stalling innovation.

Fiber Club

Challenge

Breakthrough fibre technologies with clear environmental benefits often fail to reach scale due to high production costs and limited brand adoption. Brands hesitate to invest without proven performance and cost parity.

How?

- Demand pooling for brands, reducing minimum order requirements and sharing costs, which lowers financial and logistical barriers for suppliers and manufacturers to adopt next-gen fibres.
- It facilitates brand-innovator collaboration to test and validate innovations like Circ's recycled cellulose, Almat's waste-based fibres and Samsara's enzymatically recycled polyester and nylon fibres.
- It helps address performance concerns early by aligning on quality standards, use cases, and technical requirements.
- It provides early market access and co-development pathways, reducing commercial risk for both brands and innovators.

Price Parity Toolkit

Challenge

Next-gen materials often can't compete with conventional textiles due to cost, scalability, and lack of compatibility with existing supply chains.

How?

- Through premium decoupling, the Price Premium Toolkit (PPT) lets brands and suppliers separate the higher cost of next-gen material from the physical product, charging a distinct premium fee rather than passing compounded costs down the supply chain.
- It focuses on bridging the "valley of death" between R&D and commercial scale by validating materials in real-world conditions.
- Premium decoupling will drive brand demand, enabling manufacturers to optimise processes for next-gen materials and further reduce premiums (due to expected lower costs and easier sourcing).

Beyond50 Denim

Challenge

Conventional cotton remains the dominant fibre in denim production, driving high water and chemical use. Cottonised hemp offers a lower-impact alternative, but its large-scale viability, handfeel, and processing performance remain unverified.

How?

- It validates SEFF's cottonised hemp fibres in combination with Fibre52's bio-friendly chemistry across industrial denim trials at $\geq 50\%$ hemp content, applied and evaluated at the manufacturing level in two different supply chains (Bossa in Turkey and Nice Denim in Bangladesh)
- It benchmarks performance, handfeel, and aesthetic characteristics against conventional 100% cotton denim
- It measures reductions in water, chemical, and energy use to build the case for scalable cotton alternatives
- It pools brand participation & align supply chain partners to reduce risk, share cost and exchange data

The Next Stride

Challenge

Footwear soles are predominantly made from fossil-fuel-derived polymers. While bio-based alternatives show environmental potential, brands and suppliers hesitate to adopt them due to limited industrial validation and unknown performance at scale.

How?

- It conducts collective industrial trials to test bio-based polymers in footwear sole applications, assessing durability, abrasion resistance, and process compatibility
- It quantifies environmental impact through full life-cycle assessments (LCA)
- It pools brand participation to reduce risk, share cost, exchange data, and accelerate commercial readiness of bio-based sole materials




WE NEED TO SORT IT OUT!

The industry's circularity efforts are hitting a wall, and the root cause isn't only about overproduction and overconsumption: **it's about the fundamental infrastructure and processes that make recycling viable.**

04.

WE NEED TO SORT IT OUT!

The problem starts with waste not being disposed of properly, and even when it is, there simply isn't enough consumer awareness, and there aren't enough collection bins or recycling centres to handle the massive amounts being generated, meaning **vast amounts of textile waste never even enter recycling streams**, stalling circularity before it can begin. The problem continues when materials arrive at processing facilities, as they're often contaminated, mixed with non-recyclables, or degraded to the point where they can't be effectively processed.



The sorting process largely remains inconsistent, as facilities still rely on time-intensive manual processes, with workers standing at conveyor belts trying to identify and separate materials by hand.

This creates a bottleneck where the human effort and overall costs required to make waste useful exceed the perceived value of the materials. While these systems continue to function, they're fundamentally misaligned with today's ambitions for a circular textile industry: it's like **trying to stream Netflix on dial-up internet**. They sort of work, but they're outdated and can't handle what we actually need them to do today at the speed, scale and economics needed.



Take, as an example, footwear: **the complex construction of shoes** (often combining rubber, foam, leather, textiles, and adhesives) **makes them extremely difficult to recycle.** Even when collected, separating these materials at scale is costly and technically challenging, and many recycling facilities lack the capacity or technology to process them efficiently. As a result, a large proportion of discarded shoes still end up in landfills or incineration, and ultimately, around 90% of the shoes produced each year are never recovered.⁴

The barriers are both **systemic** and **financial.** Global trade policies are fragmented and inconsistent, making it risky to invest millions in pre-processing and sorting facilities when you can't predict what regulations will look like next year. For instance, the Extended Producer Responsibility (EPR) schemes remain patchy and poorly coordinated across markets, creating uncertainty about who bears the cost burden and what standards will be enforced.

This uncertainty is compounded by scaling challenges that create a cyclical problem: sorters and recyclers won't invest in mass-adoption of innovation without guaranteed demand, but brands won't commit to large purchases without proven, cost-effective technology. The result is a **market paralysis where promising innovations remain stuck** in pilot phases while the volume of textile waste continues to rise.

⁴ Vivobarefoot. (n.d.). 22 billion pairs of shoes are dumped into landfill every year. Available [here](#).

ADDRESSING THE CHALLENGE

Sorting For Circularity (Europe, US, India)

Challenge

The lack of standardised sorting systems and reliable material data hampers effective textile recycling and reuse. Absence of clear economic incentives, recycling struggles to scale as a viable business model.

How?

- It maps waste flows and fibre compositions across key regions (e.g. Europe, India, US) to understand volume, type, and quality.
- It pilots automated sorting technologies to separate by fibre type at scale using machine learning and AI to collect product information.
- It provides the data backbone for recyclers and policymakers to plan infrastructure development and investment.

Sort to Sustain (India)

Challenge

India has a large but fragmented post-consumer textile waste value chain, with formal Textile Recovery Facilities (TRFs) still in their infancy. This creates critical bottlenecks for textile-to-textile recycling. There is a lack of post-consumer sorting and pre-processing infrastructure to meet the demands of high-grade recycling industries.

How?

- It implements sorting trials in supplier factories to classify production waste by material.
- It enhances traceability and material purity, enabling direct input into mechanical and chemical recycling systems.
- It builds localised sorting infrastructure models to be replicated at scale.
- It provides comprehensive resources: from technology access and sorters handbooks, to funding mechanisms and ecosystem engagement.

T-Rex - Europe

Challenge

There's a strong need for a harmonised EU blueprint and clear business opportunities for closed-loop sorting and recycling of household textile waste.

How?

- Establishes a harmonised framework for textile-to-textile recycling by defining feedstock quality criteria and circularity guidelines across the value chain.
- Runs real-world trials with recyclers and brands to validate standards across mechanical and chemical pathways, proving that materials can be recovered and re-enter the supply chain, bypassing the traditional single-use model.
- Supports recyclers with technical guidelines to ensure input compatibility and scaling potential via its Blueprint to scale textile-to-textile recycling chemical recycling in Europe.

World of Waste

Challenge

Lack of visibility on where waste hotspots are is hindering waste use

How?

- By consolidating waste textile data, recyclers know where feedstock hotspots are, categorised by fibre sort.
- Aiding the infrastructure of recycling by allowing recyclers to strategise where their factories should be located in close proximity to reliable feedstock.

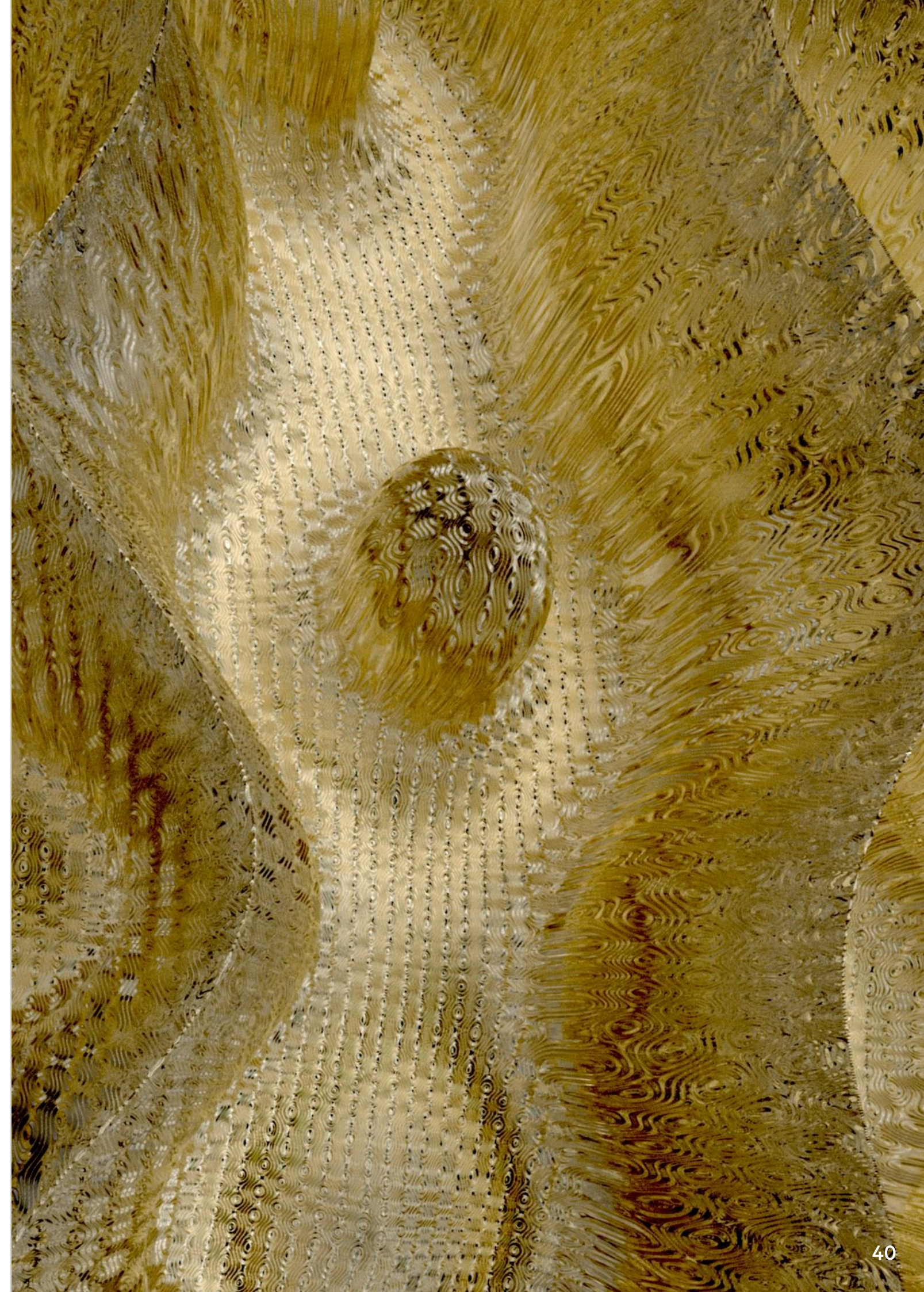
Closing the Footwear Loop

Challenge

Lack of scalable infrastructure and systemised processes for recycling footwear at end-of-use. With footwear composed of complex, multi-material components (often exceeding 40 materials per pair), current waste streams are ill-equipped to enable effective sorting, disassembly, or material recovery, resulting in most post-consumer footwear being incinerated or landfilled.

How?

- Mapping European post-consumer footwear waste streams to gain a clear understanding of the current state of footwear waste.
- Scouting and validation of end-of-use innovations.
- Developing circular design principles: to establish a comprehensive roadmap for circular footwear design.



THE BACKBONE IS BUCKLING:

suppliers'
analysis-paralysis

The fashion industry's decarbonisation ambitions hinge on a critical reality: suppliers are the backbone of global textile production. **When suppliers modernise, entire supply chains transform.**

05.

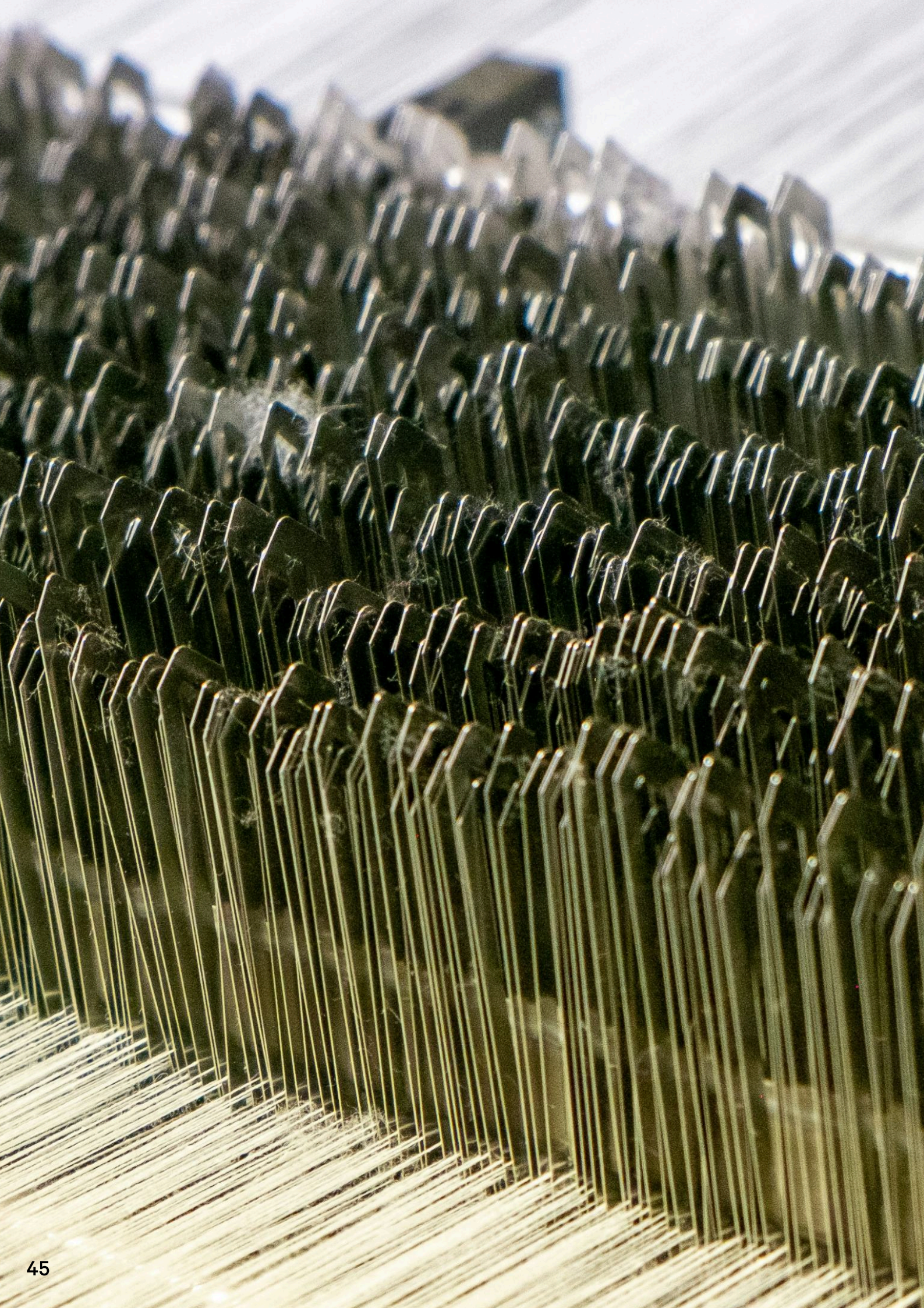
THE BACKBONE IS BUCKLING: SUPPLIERS' ANALYSIS-PARALYSIS

When they innovate, emissions plummet, as Tier 2 production (which is the stage where fabrics are produced and treated before being assembled by Tier 1 suppliers) remains the largest source of emissions (55%), followed by raw material production (22%)⁵. When they adopt innovative technologies, the industry's environmental impact shifts dramatically. **Yet this potential remains largely untapped**, trapped within a system that simultaneously demands transformation while falling short in the commitment to achieve it.

At the heart of the problem is the relentless **race to the bottom**: brands compete to produce clothing at the lowest possible cost, continuously driving down prices, while expecting sustainability on tap. The result is that suppliers are asked to deliver cleaner processes, better materials, and greater transparency, yet rarely receive the **long-term commitments** needed to make those upgrades viable. Contracts remain short-term, margins razor-thin, and investments in innovation too risky for suppliers to shoulder alone.

⁵ Apparel Impact Institute. (2025). Taking stock of progress against the roadmap to net zero. Available [here](#).





To make matters worse, suppliers are too often stuck in a storm of **competing demands**, pulled in conflicting directions by brands with diverging priorities. Many brands bring their own approach (different metrics, reporting systems, and compliance requirements), creating a dizzying array of audits and checklists. The result? Suppliers tend to spend more time filling out forms than fixing issues on the factory floor, with limited guidance on how to meet targets or which industry shifts are truly here to stay.

And even the most forward-thinking suppliers, willing to invest and evolve, face a daunting reality: **there is no clear blueprint for modernisation**, no coordinated strategy, making every investment feel like a risky, one-off effort rather than a step towards industry-wide change. This leaves factories trapped in a status quo where business survival outweighs sustainability ambition, leaving suppliers stuck in survival mode: eager to lead, but trapped in a system that holds them back.

ADDRESSING THE CHALLENGE

Future Forward Factories

Challenge

Tier 2 facilities are outdated and represent the largest share of Scope 3 emissions (55%), yet lack the incentives or examples to upgrade.

How?

It accelerates the transition to low-carbon manufacturing by:

- Creating the first-of-its-kind collaborative facility in India showcasing renewable energy and efficient production technologies.
- Developing a scalable blueprint for manufacturers to replicate across geographies.
- De-risking investments by demonstrating commercial and environmental viability.

Advanced Processing Matrix

Challenge

Testing processing innovations is a lengthy and expensive exercise, creating a barrier to brand and supplier adoption.

How?

It identifies and maps key Tier 2 processing technologies alongside their commercial readiness and environmental benefits, providing suppliers and brands with a clear, scalable blueprint for decarbonising the most emission-intensive stage of the supply chain.

Good Fashion Fund

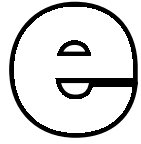
Challenge

Sustainability innovation remains underfunded and risky for manufacturers.

How?

- It unlocks financing in manufacturing markets to implement impactful, validated technologies.
- It supports long-term transformation by aligning financial tools with measurable environmental outcomes.

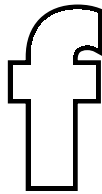
GLOSSARY



END-OF-USE

The end-of-use stage focuses on extending the life of materials and garments by enabling technologies and infrastructure that can redirect garments into reuse and recycling. This supply chain step involves innovation in sorting, chemical recycling processes, and waste match-making platforms. Directing textile waste coming from factories and households into new use phases allows the industry to reduce waste and reuse materials to build a regenerative system.

Link [here](#).



FASHION SUPPLY CHAIN TIERS

The textile industry's supply chain is commonly represented in four Tiers, which are used to describe the production process from raw material extraction to the finished product. Tier 4 includes the cultivation and extraction of raw materials from the earth, plants or animals. Tier 3, the processing of raw materials into yarn and other intermediate products. The processing stage falls into Tier 2 and is often referred to as material production. Tier 1 is the assembly and manufacturing of the final products.

Tier 0: Branding, Retailing & Distributions: Marketing and distribution of final products without production process.

Output: Finished products (e.g., apparel, home textiles, footwear).

Tier 1: Finished Product Manufacturing: Assembly and manufacturing of final products.

Output: Finished products (e.g., apparel, home textiles, footwear)

Tier 2: Material Manufacturing: Production and finishing of materials (e.g., fabrics, trims) that go directly into the finished product.

Output: Finished materials (e.g., fabrics, finished leather, composite material).

Tier 3: Intermediate Material Processing: Processing of raw materials into yarn and equivalent state.

Output: Intermediate material (e.g., yarn)

Tier 4: Raw Material Production & Primary Processing: The extraction and farming of primary raw materials from the earth (e.g., fossil fuels), plants (e.g., cotton), or animals (e.g., wool), and the collection of secondary raw materials (e.g., reclaimed textiles), as well as the processing of these raw materials into a commodity state.

Production: Extraction and farming of primary raw materials and collection of secondary raw materials.

Primary processing: Primary processing of (primary/secondary) raw materials into a commodity state.

Output: Raw material (e.g. seed cotton, greasy wool, reclaimed materials, latex, petrochemicals, wood, and raw hides). Processed raw material (e.g. staple fibre and filament, and hides).

Link [here](#).

FIBRE FRAGMENTS

Within the fashion and textile industry, the term 'microfibre' clashes with the industry terminology for a very fine synthetic yarn defined as having a count of 1dtex or less, specifically referring to the small diameter rather than the small length or size.¹⁸ To avoid confusion, the term 'fibre fragment' is considered more appropriate as it also captures the notion that fibres shed from all fibre types, their fibrous structure, and reflects the action by which a fibre is released from the main textile construction.

Link [here](#).



LIFE-CYCLE ASSESSMENT (LCA)

Life-cycle assessment is a methodological framework for estimating and assessing the environmental impacts attributable to the life cycle of a product or service. Through an LCA, we can evaluate the effects that it has on the environment over the entire period of its life, thereby increasing resource-use efficiency and decreasing liabilities.

Link [here](#).

n

NEXT-GENERATION FIBRES & MATERIALS

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

Link [here](#).

p

POST-INDUSTRIAL TEXTILE WASTE

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

Link [here](#).

PRE-CONSUMER TEXTILE WASTE

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

Link [here](#).

POST-CONSUMER TEXTILE WASTE

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

Link [here](#).

t

T2T (TEXTILE-TO-TEXTILE) RECYCLING

T2T recycling is the process of recovering textile waste (both pre- and post-consumer) and reprocessing the material into new garments. Textile recycling is crucial to reduce waste, circulate materials, and allow nature to regenerate: the tenets of a circular economy.

There are three ways we can recycle textiles:

Mechanical Recycling is currently the most widely used and established method for converting textiles into recycled raw materials. It uses mechanical processes to physically reduce the textile waste into shredded material, fibres, scraps, clippings or other outputs. This route is versatile and can process both natural and synthetic fibres, but knowing the exact fibre composition is crucial, particularly for blended fabrics, to ensure efficient recycling.

Thermomechanical Recycling is primarily applied to synthetic textiles made from thermoplastic fibres. It combines mechanical processes, such as shredding and densification, with thermal processes like extrusion and pelletising, to produce recycled raw materials in the form of pellets or compounds. These materials can be used for melt-spinning new fibres or in plastics manufacturing.

Chemical Recycling is a generic term that refers to any process that modifies or purifies a polymer's chemical structure to produce materials that can be used as raw materials. Depending on the technology (e.g., dissolution, depolymerisation) and input, outputs may include monomers or purified polymers. These outputs can then be used to produce new fibres for textiles (closed loop) or materials for other sectors (open loop). This approach enables the production of materials with properties comparable to virgin fibres.

Integrated Recycling refers to processes that combine mechanical (including thermomechanical) and chemical methods to process blended textile feedstock, optimising the recovery of materials from complex fabrics.

TEXTILE RECOVERY FACILITY

A Textile Recovery Facility (TRF) is a centre that collects, sorts and processes textile waste. These facilities categorise and channel textiles based on suitable end-use cases, such as resale, recycling, or downcycling. They may also carry out additional processes such as cleaning, repairing, upcycling and other such requirements. Unlike a generic Material Recovery Facility (MRF), a TRF is specialised for textiles.