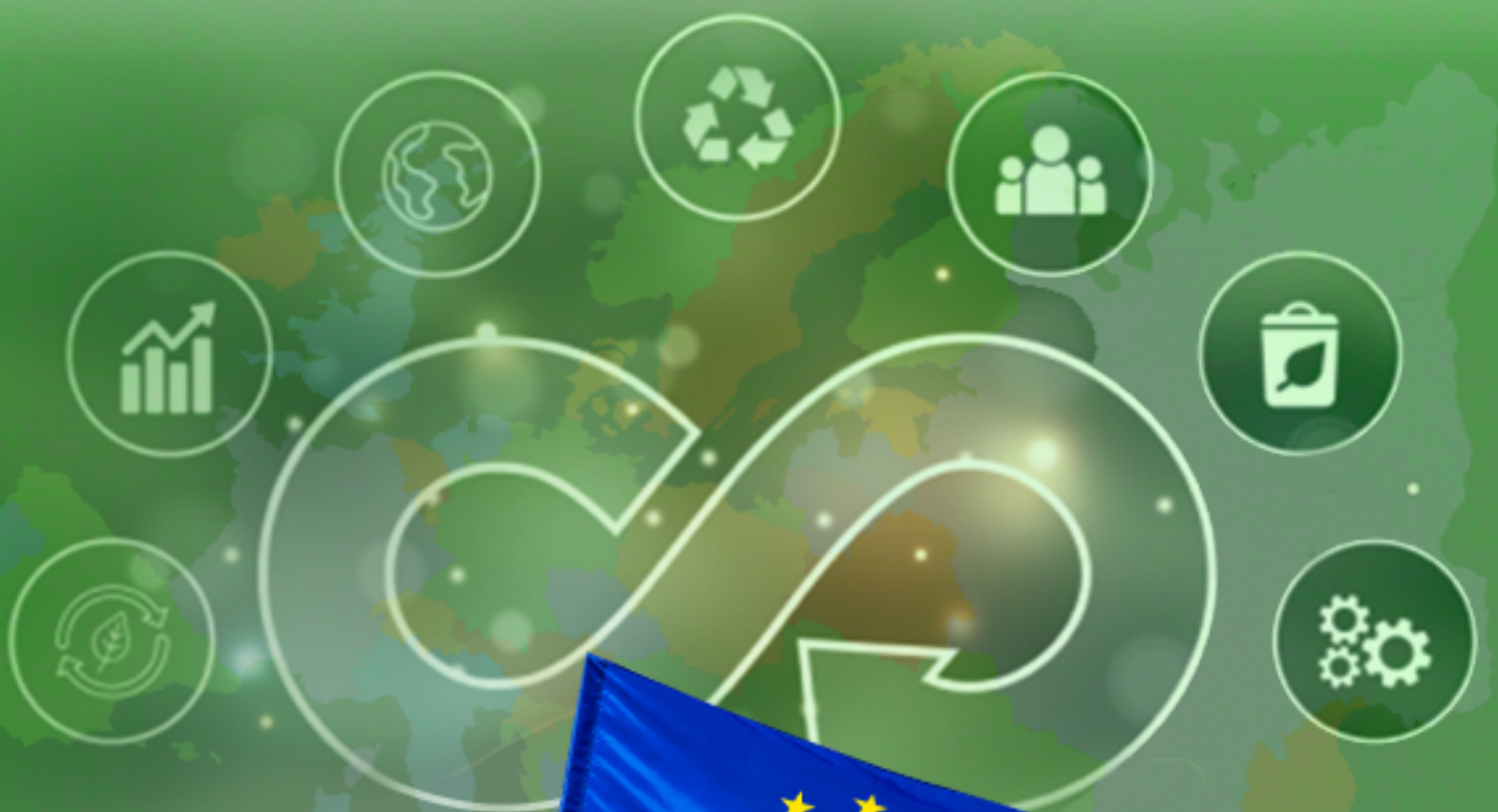


Europe's Fashion Industry Accelerates Shift Towards Circularity & nearshoring in 2024



Stella McCartney introduces world's first biologically recycled parka

More at... 08

Braskem's tech gives old shoes new life with recycling grant

More at... 12

UPM x Vaude launched world's first bio-based fleece jacket

More at... 20



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Content

December 2023

- | | | | | | |
|-----------|---|-----------|--|-----------|--|
| 5 | Europe's Fashion Industry Accelerates Shift Towards Circularity & nearshoring in 2024 | 16 | Project Re:SUEDE, PUMA's biodegradable compost sneaker | 29 | Reebok and Futureverse launch AI-powered Metaverse platform |
| 8 | Stella McCartney introduces world's first biologically recycled parka | 18 | Vegan leather, an eco-conscious choice | 30 | AI predicts shopper behavior for smarter retailing |
| 10 | Paisley Museum Project: A story bringing ancient textile collections back to life | 20 | UPM x Vaude launched world's first bio-based fleece jacket | 32 | Trust Protocol's farm data exploration and key findings on soil carbon metrics |
| 12 | Braskem's tech gives old shoes new life with recycling grant | 22 | Recycled shoes take center stage in 2023 as major brands embrace trash-to-treasure | 33 | Diesel announces sustainable collaboration with Lee |
| 13 | BioFluff – future of fur is here! Say no to animal fur | 26 | Algaeing™ and Birla Cellulose Join Forces to introduce Algae-powered fibre | 34 | Minimalistic Fashion: A Philosophy of Elegance, Quality, and Sustainability |
| 14 | Apparel's cleanup mission 2023: Battling 'textile zombie' and 'fossil fashion'! | 28 | Algaeing™ and Birla Cellulose Join Forces to introduce Algae-powered fibre | | |

Europe's Fashion Industry Accelerates Shift Towards Circularity & nearshoring in 2024

■ M A Mohiemen Tanim & Sayed Abdullah

The European fashion scene, long admired for its elegance and trendsetting innovations, is facing a shift towards circularity. Driven by environmental concerns, shifting consumer values, and forward-thinking policy, the continent's textile and apparel industry is shedding its linear "take-make-dispose" model and embracing a closed-loop approach that promises to benefit both people and planet.

At the same time, for some years now the fashion industry has been moving away from an outdated sourcing model 'characterized by long lead times, maximizing order sizes, and low flexibility.' Adopting to a new method known as 'nearshoring.' Especially the pandemic has accelerated that fashion companies in Europe and North America to produce clothes closer to home.

This transformation is fueled by a potent cocktail of factors. The environmental footprint of the fashion industry is staggering. Textile production alone accounts for roughly 10% of global carbon emissions and 20% of wastewater discharge. Mountains of discarded clothing, often laden with harmful chemicals, end up in landfills or incinerators, releasing potent toxins and microplastics into the environment. Consumers are increasingly aware of these impacts and demanding more sustainable options.

European policymakers are heeding the call. The EU's 2022 Strategy for Sustainable and Circular Textiles, coupled with national regulations like France's Extended Producer Responsibility (EPR) scheme, are pushing brands to take accountability for the entire lifecycle of their products. This includes designing for durability, promoting reuse and repair, and investing in efficient recycling technologies.

But the real change is happening on the ground, where innovative minds are redefining the possibilities of circularity. Textile engineers are pioneering bio-based materials derived from mushrooms or waste food, while others are developing revolutionary recycling methods capable of transforming old clothes into pristine new fibers. Brands, from high-end labels to fast-fashion giants, are adapting their models. Some offer take-back programs, inviting customers to return unwanted clothes for refurbishment or recycling. Design itself is being rethought, with a focus on timeless silhouettes, durable materials, and modularity that allows easy repair and customization.

This shift towards circularity is not without its challenges. Infrastructure for textile recycling is still nascent, and scaling up innovative technologies takes time and



investment. Consumer behavior also needs to evolve, with a move away from the disposable mentality ingrained in fast fashion.

However, the momentum is undeniable. Experts predict that by 2030, circular models could account for up to 20% of the European textile and apparel market. This translates to substantial reductions in waste, emissions, and water consumption, not to mention the creation of new green jobs and a more resilient industry.

At the heart of this transformation lies a vibrant realm of innovation, where scientists and engineers are weaving magic with machines that breathe new life into textiles.

One revolutionary concept is biofabrication. Imagine clothes spun from the threads of mushrooms, pineapple leaves, or even food waste. Bio-based materials offer a sustainable alternative to petroleum-derived synthetics, significantly reducing the carbon footprint of production. Companies like Mycotex and Bolt Threads are pioneering this field, crafting leather-like fabrics from fungal mycelium and silky yarns from cellulose extracted from agricultural waste.

Next comes the realm of mechanical alchemy. Innovative sorting and recycling technologies are transforming mountains of discarded clothing into a valuable resource. AI-powered robots like those developed by SORTER can identify fiber blends, colors, and condition with remarkable precision, directing garments towards specific recycling pathways. This level of accuracy allows for high-quality recycled fibers that can be rewoven into new textiles, minimizing the need for virgin materials.

Companies like Re:newcell and Infinited Fiber are pushing

the boundaries of fiber regeneration. Their cutting-edge processes break down used cotton and polyester into their molecular components, essentially creating virgin-quality fibers from old clothes. This closed-loop approach significantly reduces water and energy consumption compared to traditional cotton production, marking a major step towards circularity.

But the future isn't limited to recycling. Upcycling is gaining traction, offering creative ways to breathe new life into pre-loved garments. Companies like MUD Jeans and Nudie Jeans offer repair and renewal services, extending the lifespan of clothes and fostering a culture of conscious consumption. Designers like Martine Rose and Gabriela Hearst are champions of upcycling, incorporating vintage pieces and reworked materials into their collections, showcasing the beauty and potential of pre-loved textiles.

These technological advancements are just the beginning. Researchers are exploring enzyme-based recycling methods, 3D printing of recycled fibers, and even nanotechnology to improve the properties of recycled materials.

Stitching Together Change: Brands and Consumers in the Circular Web

The shift towards circularity in the European textile and apparel industry is not just about technology and policy; it's about a fundamental change in how we think about fashion. Brands are playing a crucial role in shaping this new paradigm, adopting innovative models and engaging consumers in the journey towards a more sustainable wardrobe.

Rethinking Design and Production:

Gone are the days of fast fashion and throwaway trends. Forward-thinking brands are taking a conscious approach to design, prioritizing durability, timeless styles, and modularity. Stella McCartney, for example, utilizes recycled and organic materials in her collections, while Patagonia focuses on creating garments built to last, offering repair services and lifetime warranties.

Circular design principles are gaining traction, with brands like Eileen Fisher and Filippa K incorporating features like detachable zippers and buttons, allowing garments to be easily disassembled and repurposed. This not only extends the lifespan of clothing but also simplifies recycling and upcycling processes.

Innovative business models are emerging to challenge the traditional ownership model. Clothing rental services like Nudie Jeans and Dresslender provide access to high-quality fashion without the burden of ownership, promoting responsible consumption and reducing textile waste. Subscription services like Le Tote offer curated boxes of pre-loved garments, giving them a second life and catering

to the growing demand for vintage and unique pieces.

Engaging Consumers:

Consumers are at the heart of the circular fashion revolution. Brands are fostering a dialogue about sustainability, educating customers about the impact of their clothing choices and empowering them to participate in the closed-loop system.

Transparency is key. Brands like Everlane and Patagonia are showcasing their supply chains and production processes, building trust and encouraging informed consumer choices. Platforms like ThredUp and Depop democratize the secondhand market, making it easier for individuals to buy and sell pre-loved garments, extending their lifespan and promoting conscious consumption.

Reward programs and incentives play a role too. H&M and Levi's offer in-store garment take-back programs, providing discounts for returning unwanted clothes. Such initiatives not only divert textiles from landfills but also create a valuable resource for recycling and upcycling.

Nearshoring

Over 7 out of 10 fashion brands and retailers say they are turning to nearshoring because of the influence on their global supply chains instigated by the pandemic and shipping disruption, according to a new report.

Turkey is named as one of the top three most promising sourcing locations for Europe. And a three-quarters of companies see shipping disruptions as the greatest threat to flexibility and speed, followed by demand volatility and the pandemic.

The study, entitled 'Revamping fashion sourcing: speed and flexibility to the fore' by consultants McKinsey and Company, says that 71% of fashion companies are planning to surge nearshoring by 2025.

It should be noted that fashion making is unlikely to wholly relocate. With the growth of economies like China and India comes a higher demand for fashion, so international brands will want to keep at least some of their manufacturing operations closer to those countries than traditional markets in Europe and North America. For them, it will be more about diversifying their supply chains than simply moving them.

The Road Ahead:

The European fashion industry's shift towards circularity is still in its early stages, but the momentum is undeniable. While challenges remain, from scaling up innovative technologies to changing consumer behavior, the collaborative efforts of brands, policymakers, and consumers are paving the way for a more sustainable future.

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Stella McCartney introduces world's first biologically recycled parka

■ Homayra Anjumi Hoque

A new era of sustainable fashion has begun with the debut of the world's first garment made using biological recycling, a revolutionary technology that transforms plastic waste into new polyester. The parka jacket, designed by British Fashion Designer, Stella McCartney and Protein Evolution, was unveiled at COP28, the UN climate change conference, to showcase how artificial intelligence and biology can create circular and low-carbon solutions for the fashion industry. It will feature soft natural tones and reference parachute models that have appeared in the British brand's collections, combining a sustainable and sporty attitude. This jacket serves as a proof of concept highlighting new innovation in textile circularity.

The jacket is made from fabric that was produced by breaking down rigid packaging and industrial textile waste into their raw ingredients, without the need for fossil fuels. The process, called Biopure, is capable of handling various waste streams, from plastic bottles to industrial textiles. Biopure claims to offer a sustainable solution across multiple sectors. Protein Evolution's initial fundraising round was led by Collaborative Fund's climate-focused Collab SOS, which is in partnership with McCartney and LVMH. In late 2022, Protein Evolution and Stella McCartney announced a R&D collaboration for Protein Evolution to turn unused polyester fabrics from Stella McCartney's previous collections into virgin-quality polyester, piloting a circular solution for the fashion industry. The team has marked a major breakthrough and milestone for the partnership in less than a year.

Protein Evolution was founded in 2021 by entrepreneur Connor Lynn and Jonathan Rothberg, a world-renowned scientist, entrepreneur and National Medal of Technology and Innovation recipient. It has claimed to be the "only company in the world" to validate bio-recycling technology through a garment that can be integrated into the existing supply chain, positioning it as a real solution to decarbonise plastic production and address the plastic waste crisis.

How does the Technology work?

Protein Evolution's Biopure technology leverages AI-designed enzymes to break down polyester waste into the raw materials of new polyester that are indistinguishable to the petroleum-derived raw materials used in polyester manufacturing today. When the enzymes are combined with plastic waste, they break it down into what Protein Evolution calls "building blocks" – these are blocks of plastic-based waste produced by a low-emission, eco-friendly process.



Figure: Protein Evolution and Stella McCartney parka made using biological recycling
Source: Protein Evolution/Stella McCartney

1. Once these raw materials are re-integrated into the manufacturing process, the result is an infinitely recyclable polyester with a meaningfully lower carbon footprint than polyester produced from petroleum.
2. Biopure is capable of handling a variety of waste streams, from plastic bottles and clam-shells, to industrial textiles and garments.
3. To create the Parka, Protein Evolution transformed rigid packaging and industrial textile waste into textile-grade polyester. Working with partners in the EU, the polyester was then spun into yarn and woven into new fabric by Stella's team to be used in the design of the coat.

What's the collaboration, Protein Evolution x Stella McCartney promising for:

The collaboration Protein Evolution x Stella McCartney is aiming for applying Biopure technology to process leftover polyester and nylon fabric from Stella's collections. The partnership will take the technology from the lab into a real-world setting, an important step toward seamlessly integrating PEI's technology into existing global brands' manufacturing processes. Ultimately, this collaboration



Fig: Stella McCartney's Parka jacket's walkshow in Paris street Source: Hypebeast

will demonstrate for the first time how complex fabric types, such as nylon and polyester blends, can be fully re-used to make new plastic material in a low-energy, cost-effective way.

With brands producing almost twice as much clothing as in 2000 – and much of that growth coming from clothing made from plastic-based fibers. The possibility of fully recycling textile waste in this way can open up a wide solution for the existing problems in both the fashion industry and our environment.

According to concerned Personnel's saying:

Commenting on the collaboration, Stella McCartney, Designer and Founder of Stella McCartney said: "Anybody who knows me knows that I hate waste, which is why I am so thrilled about our collaboration with Protein Evolution. Through my SOS Fund, we were among the first to invest in their pioneering biological recycling technology; one that has the potential and power to transform the world's plastic



Fig: Protein Evolution, Inc. (PEI); PEI co-founders Scott Stankey and Connor Lynn with their innovation

waste into infinitely recyclable polyester.

"Over the last year, Protein Evolution has taken unused fabrics from my past collections to test and prove their textile-to-textile circular process. This allowed my atelier to design and create the beautiful, airy parachute parkas made from biologically recycled polyester that you can see at our Sustainable Market at COP28."

Connor Lynn, co-founder and chief business officer of Protein Evolution, said in a statement: "This marks a pivotal moment in the move towards textile-to-textile circularity in the fashion industry." "Not only is this coat validation for the utility and quality of bio recycled polyester – specifically polyester chips created using Biopure – it also offers companies an alternative to the landfill or incinerator for their fabrics, extending the life of their materials indefinitely," he added.

Sophie Bakalar, Collaborative Fund partner, commended Protein Evolution's achievements and said, "We're excited for the world to learn about a company we've believed in, and backed from day one. Protein Evolution's breakthrough technology delivers a cost-effective, high-quality way to combat plastic waste and create a truly circular product, not only in fashion, but across industries. It's remarkable what the company has achieved in less than a year of this collaboration with our partner Stella McCartney."

In October, the Stella McCartney brand was named an early adopter of Materials Impact Explorer (MIE), a risk assessment tool designed specifically for the fashion, textile and apparel industry. This was preceded through a partnership with the organization Non-profit Textile Exchange, global technology company, Google, NGIS, a location technology company and the World Wildlife Fund (WWF).

Paisley Museum Project: A story bringing ancient textile collections back to life

■ Homayra Anjumi Hoque



Figure: Student from University of Glasgow conserved ancient piece ranging from Egyptian mummy to Dhakai muslin, Source: Renfrewshire Council

A group of students from Scotland is working to restore and display some of the country's most precious fabric collections as a part of reviving the country's rich and diverse history of textiles. The students, from the University of Glasgow and the Glasgow School of Art, are part of a £45 million project to transform the Paisley Museum into a world-class cultural destination. As part of the project of refurbishment of Paisley Museum, the textile conservation students have conserved items of clothing dating from the 1830s through to the early 20th century. The students are working with experts and curators to research, conserve and interpret the museum's textile treasures, ranging from ancient Egyptian mummy wrappings to rare Dhaka muslin. They also include a children's dress and bonnet, as well as a crinoline 'cage' skirt and even a knitted woollen water polo uniform.

The Museum, which is due to reopen in 2024, is undergoing a £45 million refurbishment which will create a world-class attraction with the local community firmly at its core. The work is taking place as part of a wider investment by Renfrewshire Council aimed at using the town's

internationally-significant cultural and heritage offer to change its future. For this collaboration, The Clore Duffield Foundation has committed £200,000 towards the creation of a dedicated learning space for children and young people in the 'new' museum.

Kirsty Devine, Project Director at Paisley Museum Re-Imagined, said staff were "thrilled" to have the support of Clore Duffield. Ms Devine added: "This will further enhance our learning programme, inspiring a new generation through creativity and culture at the heart of our new museum space."

"The Clore Learning Room will be a place of joy and education, where we work to reduce the poverty-related attainment gap and challenge levels of child poverty through the huge potential that our cultural programme can offer." "We're already creating genuine, long-lasting relationships with learners, teachers and stakeholders, working with them to design a learning programme that will make a significant difference to our young people – and the endorsement from Clore Duffield is hugely appreciated," she added.

The museum refurbishment is funded by Renfrewshire Council, the Scottish Government, the National Lottery Heritage Fund and Historic Environment Scotland and supported by a fundraising campaign led by a charitable trust, Paisley Museum Reimagined Ltd. The local authority says it will “transform the future of the city” with cultural and heritage sites of major international importance.

Vision of the project:

In many cases, the textiles are dirty, filled with decades of industrial dirt and soot, and require meticulousness and effort to transform. The results were described as "phenomenal", with a noticeable difference between before and after photos. However, the job of a textile restorer is not to make the object look like new.

Regarding this issue, the Programme convenor and textile conservator, Karen Thompson described in a statement, “Conservation is about stabilizing and requires a lot of decision making.” “We’re not the Repair Shop; we’re not trying to make something pristine, it’s all about the context – sometimes you don’t want to remove a stain or a mark, as that’s part of the story.” “By preserving these objects, it gives the opportunity for people in the future to learn from them,” he added.

Karen’s colleague at the Kelvin Centre for Conservation Research and Cultural Heritage, Sarah Foskett, added: “Textiles are really rich sources of evidence – as you get a direct link to the past – people wore these pieces and they have stories.” “The students have been able to apply their learning to real objects, providing a fantastic learning curve for them. I have never seen objects clean as well in my career. There’s a lot of satisfaction that comes from that and the long term preservation of these pieces and enabling the object to have a new lease of life.”

The team helped conserve a total of 13 items, with more expected this school year. One of the most extraordinary



Figure: A crinoline 'cage' skirt was among the items restored by the Paisley Museum project Source: Paisley Museum

items preserved is the early 20th century knitted swimsuit of a member of the Irish international water polo team. It was exchanged with William G Peacock, an Olympic water polo player who trained at Paisley's Corporations Baths in Storie Street.

What are the project participants saying:

Caitlin Hartmann, 24 from North Somerset, worked on two textile pieces. She said: “I was phenomenally happy with the results achieved; the soiling was significantly reduced. I was grateful for the trust Paisley Museum put in me as a student to achieve these results and it was a great experience to be able to present this treatment to representatives from Paisley Museum.”

Hannah Lacaille, 25, from Canada, also worked on textiles for the project. She said: “It is always exciting to see evidence of use in an object because one can better imagine the lives of the people who used it. I will be proud to be able to say that I took part in making this happen in a way that is safe for the object so that it may be displayed for generations to come.”

Sean Kelly, Collections and Conservation Manager at OneRen, said: “The work done by the students and the team at the University of Glasgow has been exceptional, helping to bring these incredible objects back to life. This has been a fantastic partnership, bringing benefits for both the conservation and care of these textiles and for the next generation of conservators.”

The refurbishment project of the museum involved around 70 local organizations and community groups in developing the plans. Paisley's industrial past and global importance in textiles will be explored in new exhibition spaces, which will increase in number by more than a quarter thanks to the contributions of architects who worked at the V&A in London.



Figure: Before and after of an item of clothing restored by the Paisley Museum project, Source: Paisley Museum

Braskem's tech gives old shoes new life with recycling grant

■ Sayed Abdullah

Braskem, a leading producer of polyolefins in the Americas and a pioneer in biopolymers, has received a significant boost for its innovative EVA recycling technology. The company's research partnership has been awarded a \$504,000 Research, Demonstration, and Development (RD&D) grant from the REMADE Institute; a public-private partnership established by the United States Department of Energy (DOE).

EVA (ethylene vinyl acetate) is a common plastic used in footwear soles, and its post-consumer waste poses a significant environmental challenge. Braskem's technology offers a potential solution for recycling and reusing this material.

This dynamic crosslinking will produce secondary feedstock from recycled EVA as a sustainable solution for footwear.

Braskem Research Partnership Supports the U.S. Transition to a Circular Economy RD&D Partnership includes Braskem America, adidas, Allbirds, and the Massachusetts Institute of Technology.

Braskem is the largest polyolefins producer in the Americas and leading producer of biopolymers in the world, today announced Braskem's polymer recycling technology research partnership has been awarded a \$504,000 Research, Demonstration, and Development (RD&D) grant from the Reducing Embodied Energy and Decreasing Emissions (REMADE) Institute, a public-private partnership established by the United States Department of Energy (DOE).

The winning RD&D project is focused on innovating a new pathway for recycling ethylene-vinyl acetate (EVA) as a sustainable materials solution for the footwear industry. The project is a partnership between Braskem America, adidas, Allbirds, as well as the Massachusetts Institute of Technology (MIT). REMADE is the first institute in the U.S. dedicated to accelerating the nation's transition to a Circular Economy.

Kimberly McLoughlin, Principal Engineer, Braskem, stated, "Braskem and REMADE share a vision for building a more sustainable future, all built upon the creation of a carbon neutral circular economy. With a mutual passion for R&D-driven innovation, we are creating the next generation of manufacturing and materials science technologies."

"We commend REMADE for its leadership in effectively



Figure: This grant will support the development of a new pathway for recycling ethylene-vinyl acetate (EVA), a commonly used plastic found in footwear soles. Courtesy: Braskem

bridging government and industry to accelerate the path forward to a more sustainable economy and society," McLoughlin added.

The REMADE Institute enables the early-stage applied research and development of key industrial platform technologies that could dramatically reduce the embodied energy and carbon emissions associated with industrial-scale materials production and processing. By focusing its efforts on the technical and economic barriers that prevent greater material recycling, recovery, remanufacturing, and reuse, the REMADE Institute seeks to motivate industry investments to advance technology development and support the U.S. manufacturing ecosystem.

REMADE-funded research projects seek to innovate industrial-scale materials production and processing, achieving multiple positive impacts among the following Target Technical Performance Metrics (TPMs), including:

- Reducing primary feedstock consumed
- Reducing secondary feedstock energy
- Increasing embodied energy efficiency
- Reducing greenhouse gas (GHG) emissions
- Facilitating cross-industry reuse
- Balancing cost and energy party

According to the U.S. Department of Energy,

manufacturing accounts for 25% of U.S. energy consumption at a cost of approximately \$150 billion. Based on data from the U.S. Environmental Protection Agency, industry is the single largest contributor to greenhouse gas emissions in the nation, at 30%. By embracing the circular economy, REMADE's investments ensure that America's manufacturing sector remains globally competitive while moving the nation closer to meeting the clean energy goals set forth by the Biden-Harris Administration including achieving a net-zero-emissions economy by 2050.

This project aspires to reduce the waste generated by permanently cross-linked EVA, the rubbery material

that forms the cushion of shoe midsoles, through the development of a dynamic crosslinking technology that facilitates both the direct reuse of process scrap and the recyclability of post-service parts.

The circular economy is a sustainable model that aims to minimize waste by keeping resources in use for as long as possible, extracting their maximum value while in use, and then recovering and regenerating products and materials at the end of a resource's life cycle. Not only does this reduce environmental impact, but it also offers new business opportunities and economic benefits, supporting innovation, job creation, and global competitiveness.

BioFluff – future of fur is here! Say no to animal fur

■ Mashia Sahejabin

In recent times a significant revolution has been brought about in the fashion industry by using genuine and reliable animal fur – as the fashion sector is exploring sustainable alternatives. And this is exciting because BioFluff's plant-based fur sounds like a promising step forward.

While the majority of US consumers consider the use of fur to be ethically acceptable, influential fashion brands and retailers have now specifically decided to harden their position. They stopped using real fur in their products, which was considered a turning point in the ethical approach of the industry today. Some such companies are: Prada, Phillip Lim, Macy's, Chanel, Burberry, and Net-a-Porter Group, etc.

Turn to vegan options

Lately in place of authentic animal fur, these fashion heavyweights have turned their attention to vegan alternatives. The fashion industry has a huge impact on the entire environment, from production to transportation. Which is under increasing scrutiny and the search for sustainable alternatives is a high priority.

Introducing Biofluff

Stepping in at the right time is BioFluff, a New York and Paris-based bio-materials startup. Meanwhile BioFluff has launched a new luxury collection, most recently Savian, which features artificial fur made from natural plant fibers.

The collection stands for its commitment to vegan, GMO-



Courtesy: BioFluff

free fabrics that use natural- and mineral-based dyes.

Funding and future plans

BioFluff's innovative approach has particularly caught the attention of investors. The startup recently raised \$2.5 million in a seed funding round led by Astanor Ventures. The funds are expected to support BioFluff's expansion into other plant-based products such as interior design, packaging and toys.

The move is part of a broader trend in which plant-based materials are increasingly used as sustainable alternatives to petroleum-based products. Innovations such as clothing made from seaweed and all-natural sneakers are also now popular, gradually appearing on the market, promising a marriage of fashion and sustainability and hinting at a progressive beautiful, modern future.



Apparel's cleanup mission 2023: Battling 'textile zombie' and 'fossil fashion'!

■ Mashia Sahejabin

The year 2023 has played a huge role in hyperfast fashion, with its huge carbon footprint and terrible waste ramping up.

Beneath the glossy veneer of the fashion industry lies a growing monster – the “Textile Zombie” of unsustainable practices. Imagine mountains of unsold clothes piling up, releasing microplastics, and draining resources.

Also, dependence on fossil fuels for clothing production, from nylon to dyes, fuels climate change and depletes precious resources. With extreme price tags (both high and low) and the toxic spill of polyester clothing. (That was the year the zombies in the room—the amount of clothing they were making and buying—took on a life of their own.)

The connection between fossil fuels and the synthetics in clothing really hits home. Bringing together a coalition of organizations aiming to phase out fossil fuels from industry.

Fossil Fuel Fashion – a new organization that launched at New York Climate Week in September Fossil-fuel based polyester is cheap and the fiber of choice for hyper-fast fashion, which now dominates the market – says, “Fossil fashion is at the root of fast fashion’s worst problems: cheap materials, an overreliance on synthetics, a spiralling waste crisis and spiking emissions.”

But it wasn’t all bad news though. The link between agriculture and fashion was never discussed again;

“Reproductive” is one of the biggest buzzwords of the year. Safia Mini, founder of Fashion Declare, explains it as she calls for radical change in the industry. Fashion is not just about ensuring farmers keep carbon in the soil, but the entire process – how cotton, linen, wool and leather are farmed to the end of the garment life.

Then a triumph for regenerative fashion came in October, when Justine Aldersey-Williams presented the UK’s first indigenous, home-spun jeans made from hemp and wood grown on the wasteland of Blackburn, Lancashire.

Louis Vuitton links to some confusion that, for million-dollar handbags, the price tag still isn’t enough to justify the Crayola-colored crocodile. It was the year that saw a new focus on the dire pollution of waste colonialism.

‘Terrible pollution of waste colonialism’ ... Piles of textile and plastic waste have been spotted on the beach in Jamestown, Accra, Ghana.

In September, Claire Press, founder of the Sydney-based podcast Wardrobe Crisis, essential listening for anyone interested in sustainable fashion, released her latest book, *War Next: Fashioning the Future*. He explored some ways and terms to solve many such problems. “Overproduction and hyperspeed are two big issues facing the fashion industry,” he says. In its annual Fashion Transparency Index, Fashion Revolution reported that 88% of major fashion brands still do not disclose their annual production volume. According to the index, there is enough clothing globally and enough clothing for the next six generations.

But this year also saw European law dig back into

regulating fast fashion. In December, the European Parliament agreed to ban the destruction of unsold clothing, accessories and footwear as part of its new “eco-design” framework, which is also expected to see clothing given a digital product passport. Expected to go into effect in 2026, a QR code will give shoppers greater transparency about materials, manufacturing and even how to repair their items. Without regulation, brands are still not taking proper responsibility for their products, the materials they use and their supply chains. Soon the law will begin to force them to take collective action.

According to a report by the Clean Clothes Campaign, Shahidul Islam, a union leader for the labor rights movement, was beaten to death in Tongi, Bangladesh on June 25 this year. Four workers died and at least 115 workers and trade unionists were jailed in November as a result of ongoing protests against the new minimum wage in Bangladesh. According to Maeve Galvin, Fashion Revolution’s global director of policy and campaigns, “We are so far from achieving social justice for workers that it is shameful.”

On a more hopeful note, young people are increasingly buying their clothes second-hand, online or at car boot sales. Fast fashion brands are finding that Depop, Vinted and eBay are their biggest competitors and are starting to turn valuable retail space into second-hand clothing. As the press at *Wear Next* observes, while the cost of fashion continues to rise, we’re also seeing the parallel rise of the slow fashion movement with the repair revolution (with repair and alteration apps like Sozo and The Sim) and DIY fashion continuing to thrive. Now embark on that path of progress.



Figure: Plant-based fur – BioFluff sounds like a promising step forward.

Project Re:SUEDE, PUMA's biodegradable compost sneaker

Anjumi Hoque

THE 100% BIODEGRADABLE SNEAKER

RE:SUEDE: A PUMA EXPERIENCE TO REDUCE WASTE TO LANDFILL

1. RESUEDE
It's not enough to create a biodegradable shoe. It's important to create something that can be made from a circular material and that can be used for its entire life cycle.

2. RETURN
The RE:SUEDE sneaker is designed to be returned to the Netherlands for recycling and composting.

3. REGRIND
Using industrial processes, the sneakers are broken down into a material that can be used for other products.

4. REBIRTH
All 100% returned sneakers are used to create a new biodegradable sneaker.

THE BETA TESTERS
THE PAIRS ARE PART OF THE EXPERIMENT

Five hundred fans – consumers and influencers – are currently wearing and testing the RE:SUEDE. They're documenting their experiences for six months, because if biodegradability is viable, it's essential that the consumers get behind it too.

OPEN-SOURCE FINDINGS
Once we understand how the innovative sneaker materials perform, what photographs best, what can we improve – we'll share these findings with the industry. Because that's how we'll all win.

55+ COUNTRIES COVERED THE EXPERIMENTAL LIFESTYLE

855+ PAGES OF COVERAGE INCLUDING BUSINESS, BUSINESS AND BASH

9.5bn PEOPLE REACHED WITH MEDIA

THE SOCK LINER
The sock liner is made from 100% recycled cotton.

THE UPPER
The upper is made from Zeology tanned suede, a material that is made using an improved tanning process and that ensures better comfort for the wearer.*

THE OUTSOLE
The outsole is made from TPE-E (thermoplastic elastomer).

THE LACES
The laces are made from 100% recycled cotton.

VOGUE **Bloomberg** **DAZED** **The Guardian** **HYPEBEAST**
GQ **LA NACION** **EveningStandard.** **HICONSUMTION**

Fig. Re: Suede, PUMA's experiment in Biodegradability entry. Source: The Work

Puma, the global sports company, has achieved a remarkable feat of sustainability: turning an experimental version of its classic Suede sneaker into compost. The sneaker, which was made from biodegradable materials such as wood-based polyester, hemp, and Zeology tanned suede, was part of a two-year-long pilot project called RE:SUEDE, which aimed to test the feasibility and benefits of biological recycling in footwear. This is the first come project from PUMA's circular lab and They claimed that it has successfully turned its classic suede sneaker into

compost under certain tailor-made industrial conditions”.

In 2021, Puma created 500 test pairs of the Re: suede sneakers, using Zeology tan suede, TPE outsoles and hemp. The sportswear brand then asked volunteers to wear the sneakers for six months to test comfort and durability before sending them to a specially equipped industrial composting area Operated by their partner, Ortessa Group in the Netherlands.

How does PUMA does this work:

In early 2022, Puma invited consumers to participate in the RE: SUEDE pilot project, selecting 500 people from 2,000 applicants in Germany to wear the shoes approximately twice a week for six months. There, Puma sought to answer four questions:

1. Can Puma create a compostable shoe that people actually want to wear?

-More than two-thirds of pilot testers said they would recommend RE: SUEDE to others, although 57% said it was uncomfortable.



Fig. Diagram of the materials within RE:SUEDE sneakers. Source: Puma

2. Did participants return shoes for composting?

-Four hundred and twelve of them did so.

3. Could the shoes transform into farm-ready compost?

-Not entirely. The uppers decayed well enough to be used as standard compost but the soles took too long.

4. Can it evolve?

-Puma's Circular Lab is exploring new projects, including an effort to recycle RE: FIBER textiles with professional football shirts.

How the shoes are composted according to expertise saying:

Yet the project piqued the curiosity of Marthien van Eersel, Ortesa's manager of materials and innovations. "We thought about it and said, what the heck, let's see what it is," he said. "We have a special testing method, where we can introduce biodegradable materials into our terminal and they will not contaminate the rest of the green household waste or the compost that we make."

Private Dutch company Valor's composting facility turns 50,000 tons of household food waste and garden waste into 24,000 tons of Grade A compost for farms each year. From March to June, Ortesa mixes Puma shoes with green waste from households and makes them decompose at high temperatures in one of 14,150 square meter concrete tunnels. Every two weeks, the company screens for decomposing materials: anything less than 1.5 inches in diameter is compostable; less than 0.4 inch becomes Class- A compost.

PUMA reveals the result of project RE:SUEDE:

Anne-Laure Descours, chief sourcing officer at Puma, said in a statement: "While the Re:Suede could not be processed under the standard operating procedures for industrial composting, the shoes did eventually turn into compost." She added, "We will continue to innovate with our partners to determine the infrastructure and technologies needed to make the process viable for a commercial version of the Re:Suede, including a takeback scheme, in 2024."



Fig: Puma's original "Crack" running shoe from 1968. Source: Puma



Fig: Inside a composting tunnel at the Valor Composting Facility. Source: Ortesa

Puma also added that they have a plan to share the insight of their project in a very detailed report, "So its peers and other interested stakeholders can learn from the experiment and apply the learnings to their own initiatives".

Marthien van Eersel, manager of materials and innovations at Ortesa, added: "We learned a lot during the Re:Suede trial and how to streamline our industrial composting process to include items that need longer to turn into compost." "While all Re:Suede materials can decompose, the sole of the Re:Suede requires more pre-processing and additional time in the composting tunnel to completely break down," he added.

The Re: Suede trial is the first programme, alongside the new Re: Fiber polyester recycling initiative. The program is to be launched as part of Puma's innovation center, 'Circular Lab', led by Leading sportswear brand's innovation and design to create the future of the corporate circularity programs.

Other ventures by PUMA towards circularity goal:

RE:SUEDE isn't Puma's first stab at a biodegradable sneaker. Ten years ago the company launched an InCycle design featuring organic cotton and linen, with soles of APINATbio plastic.

Since then, the technology has improved, Puma's senior head of innovation, Romain Girard said, "The RE:SUEDE is a simple shoe, comprising only a few pieces and components." "We are currently working on exploring a similar concept but based on more complex products that have higher functional benefits."

Puma has talked to many of these startups, Girard said. "We share the same goals yet here at Puma we are looking at developing innovations that can be applied at scale," "We see the opportunity to scale up giving more people access to these types of products. We also see the chance to expand the product portfolio in this field with different silhouettes and product types."

Puma's circularity goals for 2025 include product recall in major markets; halving the amount of manufacturing waste sent to landfill; and developing recycled materials for leather, rubber, cotton and polyurethane.



Figure: Vegan-leather made from cactus plant

Vegan leather, an eco-conscious choice

■ Homayra Anjumi Hoque

Leather is one of the oldest and most popular materials used for clothing, footwear, accessories, and furniture. It is valued for its durability, versatility, and elegance. Commercial leather is made from the skins of animals, such as cows, sheep, and goats, who are killed for their flesh and hides. Leather production also involves a lot of chemicals, water, and energy, which cause pollution, greenhouse gas emissions, and resource depletion.

But what if there was a way to enjoy the look and feel of leather without harming animals or the environment? That's the promise of vegan leather, a material that mimics the properties of animal leather, but is made from plant-based or synthetic sources. Vegan leather is also known as faux leather, artificial leather, or alternative leather. In recent years, high-street staples like H&M, American Apparel and Topshop have thrust the material into the mainstream by releasing a succession of eco-leather fashion collections; Adidas even dropped a vegan leather Stan Smith in 2018. A recent study predicts the vegan leather market will be worth \$89.6 billion by 2025 (Infinium Global Research).

What is vegan leather? How is it made:

Vegan leather, or faux leather, imitates actual leather by using synthetic materials or plant-based fibers like pineapple leaves, cactus, cork, and apple peels to get a similar consistency. However, the majority of vegan leather is made out of polyvinyl chloride (PVC) and

polyurethane (PU), both of which are petroleum-based plastics. First produced in the 1920s, PVC was the earliest form of faux leather. It is created by combining polyvinyl chloride with certain chemicals that give the plastic a leather-like appearance and texture.

Characteristics of vegan leather:

- 1. Aroma:** Part of the allure of quality animal leather lies in its rich and earthy aroma: a product of the tanning process. In contrast, synthetic leather has a plastic-like smell (owing to the chemicals employed during manufacturing) or no scent at all.
- 2. Durability:** As vegan leather is normally thinner, it's more prone to general wear and tear, as well as discolouration. That said, developments in vegan leather are being made all the time, so longevity should diminish as an area of concern in the future.
- 3. Absorbency and longevity:** Far from porous, synthetic leather is actually water-resistant, meaning it is unable to develop a patina (as the phenomenon is known, is revered by leather aficionados; for some it is the ultimate indicator of quality)
- 4. Affordability:** Common PU or PVC vegan leather is generally inexpensive where the higher average real leather is really expensive.
- 5. Finishing treatment and end usage:** Vegan leather is an ideal material for creating anything from upholstery

to clothes. Water and stain resistance are two more beneficial traits for manufacturers and consumers alike. PU leather can also be treated with different finishing treatments and dyes that alter the texture and color of the material, ensuring an unrivaled degree of versatility.

Faux VS Real leather; Benefits and drawbacks:

1. Raw materials:

The majority of vegan leather is made from two types of polymers (PU and PVC). Real leather is produced from animal hides, which are considered a byproduct of the livestock industry.

Commercial animal farming contributes 15% of global greenhouse gas emissions and there is an ongoing debate about the extent to which demand for cowhide contributes to this phenomenon. A recent EU directive concluded that less than 1% of this amount should be allocated to the leather industry, due to the low monetary value of hides compared to other parts of the cow, such as meat. We also need to consider the additional costs and environmental impact of using alternative materials without leather by-products. It goes without saying that if using non-animal products is the future motto, real leather clearly can't compete with vegan leather.

2. Production Process:

Producing both vegan leather and chrome-tanned animal leather requires a significant amount of energy. This adds to the carbon footprint of each material, as fossil fuels are required and CO2 is then released into the atmosphere.

There are other negative factors of the production process of real leather. Chromium tanning – the main method of leather production, accounts for 90% of global production – involves the use of extremely toxic chemicals with carcinogenic properties. In underdeveloped countries, dangerous chemical byproducts such as sulfides and lime sludge seep into local rivers, killing marine life and animals, and putting workers at risk. The same can be said about toxins like phthalates that are exploited to make vegan leather.

3. End usage and degradability:

Real leather has a far superior shelf

life to vegan leather, which to a certain degree makes it a more sustainable option, encouraging consumers to buy less frequently and less wastefully. But while vegetable-tanned leather will naturally biodegrade, chrome-tanned leather products will spend hundreds of years in landfill sites.

Flourishment of Vegan leather usage in fashion industries:

Vegan leather has become increasingly popular in recent years, as more consumers are looking for ethical and sustainable choices in fashion. Many brands, designers, and celebrities have embraced vegan leather as a way to express their style and values. Nowadays it's affordability and accessibility is raising the audience of it. Brands are increasingly seeking vegan alternatives in response to the growing demand for environmentally friendly clothing. The sustainable fashion market is currently valued at approximately \$6.5 billion, and it is anticipated to increase to \$10 billion by 2025. By 2030, that figure is expected to reach \$15 billion.



Fig: Kylie Jenner's Fashion line; Khy, offers a wide range of faux leather products

UPM x Vaude launched world's first bio-based fleece jacket

■ Homayra Anjumi Hoque



Figure: World's first Bio-fleece jacket produced from biomass

Fleece jackets are cozy, comfortable, and versatile, but they also have a dark side. Most of them are made from synthetic materials, such as polyester, which are derived from fossil fuels and contribute to climate change, pollution, and waste. Moreover, fleece jackets shed microplastics when washed, which end up in the oceans and harm marine life.

But what if there was a way to make fleece jackets from renewable and biodegradable materials, such as wood? That's the question that UPM Biochemicals and VAUDE, a German outdoor clothing company, set out to answer. Together, they developed the world's first fleece jacket made from wood-based polyester, a groundbreaking innovation that could transform the fashion industry and

the environment. The UPM Biochemicals and VAUDE have showcased their innovation at ISPO Munich 2023, the world's largest sports trade show, where the worldwide business sports community comes together to share their perspectives about future trends and industry practice.

What is Bio – based fleece jacket and how is it made?

UPM and VAUDE are producing bio-based fleece fabric by using wood-based polyester, which is made from wood pulp that is converted into bio-monoethylene glycol (BioMEG) and then polymerized with terephthalic acid (PTA) to form polyethylene terephthalate (PET). This PET resin contains 30% of BioMEG. The PET resin



VAUDE is a leader in advancing sustainable products – addressing all aspects of sustainability from longevity through repairability and alternative use options to truly responsible materials. This collaboration confirms the strong appeal of our novel product portfolio to changemakers in the outdoor and sports industry but also beyond. By building a first-of-its-kind biorefining business to offer a new generation of bio-based renewable materials, we can help global brands to reduce their CO2 footprint and defossilize their products.”

“We recognise the acute challenge faced by the fashion and footwear industries to find more sustainable solutions for the textiles and materials used in their products. Today’s launch of the first ever bio-based fleece jacket is a milestone in responding to that challenge, enabling fashion industry leaders to take action now and move beyond fossil-based materials

Michael Duetsch
Vice President of Biochemistry at UPM

is then spun into fibers, woven into fabric, and brushed to create the fleece. This identical process replaces the fossil-based monoethylene glycol (MEG) that is normally used in polyester production with a renewable and biodegradable alternative. It’s a drop-in solution that can be used on a molecular basis and also go for corresponding recycling streams as well.

UPM and VAUDE claim that this innovation can reduce the environmental impact and increase the circularity of the textile industry. Approximately 60% of all materials currently used by the fashion industry are made from fossil-based polymers. While there is a need for synthetic polymers especially for key performance materials it is hoped that this prototype will inspire and motivate brands to exit fossil-based materials for more sustainable bio-based solutions, accelerating the sustainable transformation of the textile industry.

Re- shaping the future; What are VAUDE and UPM saying

VAUDE and UPM have collaborated to bring solutions for challenges that the textile and footwear industries are facing. Their initiatives are to take movements for making

fossil-based materials also ensuring their longevity and sustainability.

Vaude, known for its commitment to sustainability, sees this collaboration as an affirmation of the appeal of its sustainable product portfolio. By growing their biorefinery business to supply bio-based renewable materials, they aim to help global brands reduce CO2 emissions and move away from fossil-based products.

Collaboration that goes worldwide

UPM’s €1,180 million investment to build the world’s first industrial-scale biorefinery in Leuna, Germany, reflects a broader commitment to the transition to renewable materials. The biorefinery will convert sustainably sourced hardwood into biochemical products, contributing to the transition from fossil to renewable materials in various industries.

Partnerships across the whole value chain are a prerequisite for enhancing sustainable innovations across various industries. In this case, Indorama Ventures Public Company Ltd. (IVL), Bangkok/Thailand, will polymerize and spin a polyester yarn containing UPM’s BioPura BioMEG at its German site in Guben. Pontetorto SpA, Prato/Italy, will then process this yarn into a novel, bio-based polyester fabric which Vaude will use to produce the final garment. Sustainably sourced, certified hardwood will be converted into next-generation biochemicals, facilitating the critical transition from fossil to renewable materials across many industries. The biorefinery is now aiming to produce a total of 220,000 tons of bio-fleece fabric from biomass per year.



We have partnered with UPM as partnerships across the whole value chain are a prerequisite for enhancing sustainable innovations. This initial milestone marks the first step in our journey to create a polyester derived from non-fossil ingredients.

Producing outerwear made with bio-based chemicals is part of our shift towards using renewable materials in the textile and apparel value chain – we want 90 percent of all our products to be bio-based or have recycled content of more than 50 percent

René Bethmann,
Senior Innovation Manager at Vaude

Heimtextil 2024 announces “New Sensitivity” theme, focusing on sustainability

■ AH Monir

The upcoming Heimtextil trade fair, from January 9 to 12, 2024, in Frankfurt, Germany, has unveiled its theme for the 2024/25 edition: “New Sensitivity.” This theme marks a significant shift in the event’s focus, moving away from trend forecasting and towards a more holistic exploration of transformation and sustainability in the textile industry.

“New Sensitivity” goes beyond mere aesthetics, delving into the deeper emotional and psychological connections we have with textiles. It encompasses themes of mindfulness, well-being, and a renewed appreciation for nature. This shift reflects the growing awareness of the environmental and social impact of the textile industry and the increasing demand for products that are both beautiful and sustainable.

“The world is changing, and with it, the way we live and the textiles we choose for our homes,” explains Olaf Schmidt, Vice President of Textiles & Textile Technologies at Messe Frankfurt. “With ‘New Sensitivity,’ we want to explore this transformation and inspire the industry to create textiles that are not only functional and aesthetically pleasing but also good for the planet and the people who make them.”

Visitors to Heimtextil 2024 can expect to see a diverse range of exhibits that embody the “New Sensitivity” theme. This includes:

- **Sustainable materials and production processes:** Innovative fabrics from recycled materials, organic fibers, and biodegradable dyes will be displayed.
- **Mindful design:** Products that promote well-being and relaxation, such as biophilic design elements and textiles with calming colors and textures.
- **Artisan craftsmanship:** A focus on traditional techniques and handmade textiles that celebrate cultural heritage and support local communities.



Figure: Messe Frankfurt Exhibition GmbH / Thomas Fedra

The “New Sensitivity” theme will also be reflected in the Heimtextil Trend Space, a curated exhibition that showcases the latest trends and innovations in the textile industry. The Trend Space will feature four distinct theme worlds:

- **“Embrace Nature”:** This world will explore the connection between textiles and the natural world, featuring organic materials, biophilic design, and earthy colors.
- **“Nurture Wellbeing”:** This world will focus on textiles that promote well-being and relaxation, such as soft textures, calming colors, and natural materials.
- **“Celebrate Craft”:** This world will showcase the beauty of traditional craftsmanship and handmade textiles, highlighting the importance of cultural heritage and sustainable production practices.
- **“Reimagine Tech”:** This world will explore the future of textiles, showcasing innovative technologies that are transforming the industry.

Heimtextil 2024 promises to be a thought-provoking and inspiring event for anyone interested in the future of textiles. With its focus on “New Sensitivity,” the fair will provide a platform for innovative ideas, sustainable practices, and a renewed appreciation for the role of textiles in our lives.

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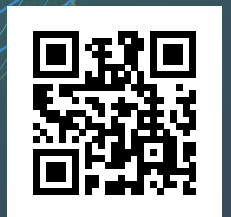
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Figure: Danny Pormes and Erna Pordes-Redecker, CEO of FastFeetGrinded, working in their company shoe recycling. Courtesy: Business Insider

Recycled shoes take center stage in 2023 as major brands embrace trash-to-treasure

■ Hodayra Anjumi Hoque

According to a report by the World Economic, more than 50 billion pairs of shoes were produced in 2022, and most of them ended up in landfills or incinerators. The footwear industry is one of the most polluting and resource-intensive sectors, consuming large amounts of water, energy, chemicals, and materials, and emitting greenhouse gasses, microplastics and toxic substances.

Why it is difficult to recycle shoes

In every pair of shoes, there is a long list of materials. Sometimes there's found up to 40 different materials are in one pair of shoes including plastic, rubber, metal, and ethylene-vinyl acetate (foam), among others; where many of which are sewn or glued together. This makes them extremely difficult to recycle.

Some materials don't have the necessary recycling facilities in place. Leather is a popular material choice for shoes – more than 60% of the UK shoe sales are leather-based shoes, and yet the recycling of leather from post-consumer shoes has not been commercially exploited.

Planning for post-consumer shoe recycling is often not included in the design process, it's an afterthought. An example (usually associated with cheap shoes) is cementing construction, where the sole is glued to the upper. Luxury brand Bally claims that once the sole and

upper are separated or damaged, the relationship between the parts are over. A cement shoe can't be resoled and therefore its lifespan is very limited.

Another example is vulcanization – the process of turning rubber into a polymer – commonly found in skate shoes. Vulcanized shoes cannot be resoled because the upper, outsole and strap bond together during the vulcanization process, making them inseparable.

These are the things that are making shoes extremely difficult, and often impossible to recycle. But what about being less bad?

How Shoe Recycling is Evolving to Meet the Challenges of Sustainability

In this regard, some shoemakers are trying to change this situation by adopting more sustainable practices and innovations. Companies like Adidas, Asics and Thaely are leading the way in creating shoes that are made from recycled or renewable materials, designed for easy disassembly and recycling, and aligned with circular economy principles. These companies are reducing their environmental impact and creating value for their customers, stakeholders, and society. One Dutch company, FastFeetGrinded, has developed a method to combat waste while the industry searches for more sustainable

materials, which can process up to 2,500 shoes per hour.

What does FastFeetGrinded do?

FFG, located in the Netherlands, collects shoes from the Dutch military, collects boxes from stores, and manufacturers pay the company to destroy defective shoes. The company then separates the shoes into different types before putting them through an automated system that uses heat and friction to separate them. Once the shoe is broken down, the materials are sorted by type, such as rubber, which is ground into fine particles, and fabric, which can be spun into yarn to create new laces.

The fully automated shoe recycling machine (SRM) at FastFeetGrinded grinds down athletic shoes and separates all foam, rubber and textile components. The machine returns from 1 '000 kg of athletic shoes 380 kg of foam, 230 kg of textiles and 170 kg of rubber. The grinded materials are reused in different products, such as sports flooring, picnic tables, or even outsoles of new shoes. From Waste to Value: How Fashion for Good, FastFeetGrinded, and Brand Partners are Transforming the Footwear Industry with Circular Solutions:

Fashion for Good launches a new pilot program with brand partners Adidas, Inditex, Target and Zalando, as well as footwear recycling innovator FastFeetGrinded to test and validate innovative footwear recycling processes to support the adoption of recycled content into shoes, thereby driving a shift towards a more circular footwear industry.

“This project will be a first in the footwear industry to allow us to understand the sustainable recycling technologies and infrastructures needed to accelerate the transition towards a circular future. By fostering collaborative partnerships like this, where companies come together to share knowledge and validate innovation, we pave the way for scalable solutions,” said Katrin Ley, Managing Director, Fashion for Good.

FastFeetGrinded has the unique ability to deconstruct any type of footwear before and after consumption, breaking it down into its macro ingredients. These macro-ingredients are then ground into smaller, high-purity pellets that FastFeetGrinded can use to create material streams for reuse. Through this collaborative pilot project, the partners will transfer pre- and post-consumer footwear to FastFeetGrinded, which will process them into a variety of new material pellets.

The next step involves FastFeetGrinded’s extensive network of supply chain partners, who will manufacture the output products, such as outsoles, midsoles and flip-flops.

Brands will closely evaluate product quality and purity, aiming to showcase the potential of FastFeetGrinded’s footwear recycling technology and pave the way for scalable solutions.

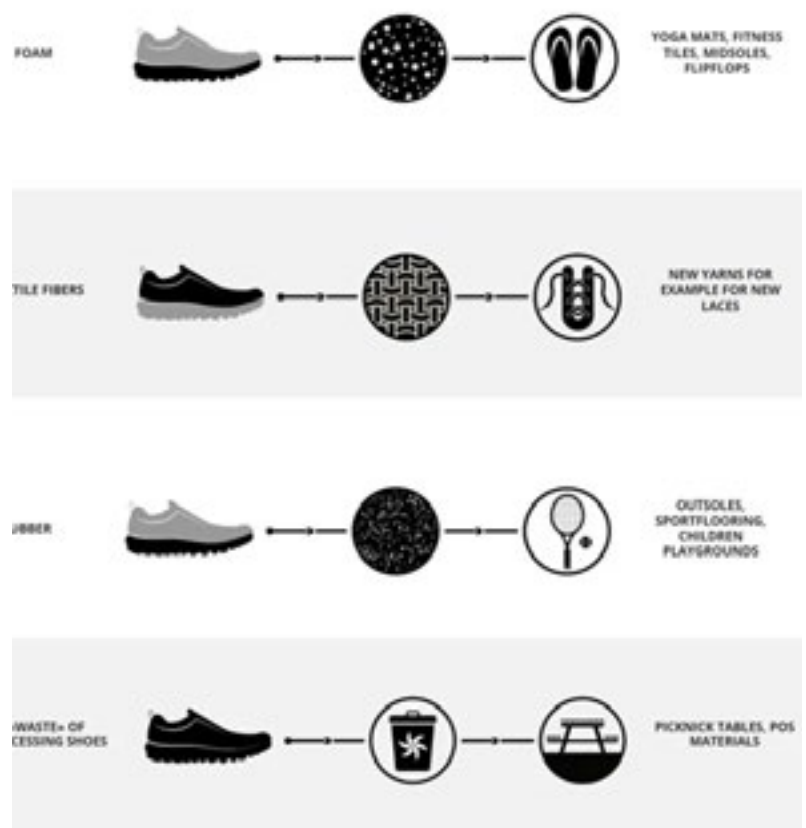


Figure: Deconstruction of Major shoe parts and converting them into recycled products.

With demand for raw materials expected to triple by 2050, urgent action is needed to reduce dependence on raw resources. FastFeetGrinded, as a key recycling innovator, plays a key role in supplying the industry with secondary raw materials, meeting growing market demand and regulatory requirements for content Recycling. To meet demand, FastFeetGrinded operates from a 40,000-square-foot facility and plans to expand its facilities globally.

What are the brands saying about this initiative?

Following the request from the Dutch government, FastFeedGrinded started working with Asics to develop new shoes from recycled materials. Asics says that while it can create new shoes from recycled materials, they can’t be used for high performance.

“If we take our highest performance running shoe, making that entirely from circular recycled materials, it won’t have the same functional properties still,” Asics manager of sustainability Romy Miltenburg told Business Insider.

Miltenburg said Asics hopes to get to a point where it can manufacture high-performance shoes from recycled materials.

“Hopefully, it will not be just a cool side project, but something we can implement into the way we make shoes at large,” Miltenburg said.


Other major shoe manufacturers, like Adidas, are also working to make their shoes more durable by using plastic that floats in the ocean. Adidas released the Futurecraft Loop in 2021, a shoe made entirely from recyclable plastic and requires no glue. The plastic is ground into pieces before being heated and spun into the polyester used to create the shoe’s upper. The shoes use only one material and are designed to be recycled into future versions of the shoe itself.

For over 30 years M&R has helped countless screen printers realize their dreams by supplying them with innovative screen and digital printing products that stand the test of time. We have the right solutions, from pre-press to product finishing, for shops of all sizes. M&R equipment is designed and built with a commitment to quality, durability, and innovation, and is backed by unrivaled 24-hour service and support. With efficient systems integration from start to finish, it's no surprise that year after year, print after print, M&R's hard-working equipment is the choice of professional printers around the world.




DS-4000™ Digital Squeegee® Hybrid Printing System

M&R's DS-4000 Digital Squeegee is setting the standard for hybrid printing. At production rates of 400+ prints per hour the DS-4000 bridges the gap between direct-to-garment (DTG) printing and screen printing. Since the Digital Squeegee prints on top of a screen-printed underbase a wide array of fabrics - including synthetic and performance blends - can now be printed digitally, opening the door to new market trends and cost-effective high-end digital textile imaging.




Screen Printing

Tiny dots while handling halftones




Digital Printing



Smoother gradient at up to 1200 dpi

Executing complex designs and multicolor prints like this is possible in screen printing but requires a lot of screens and a lot of time to setup, otherwise there may be quality problems as well as alignment problems

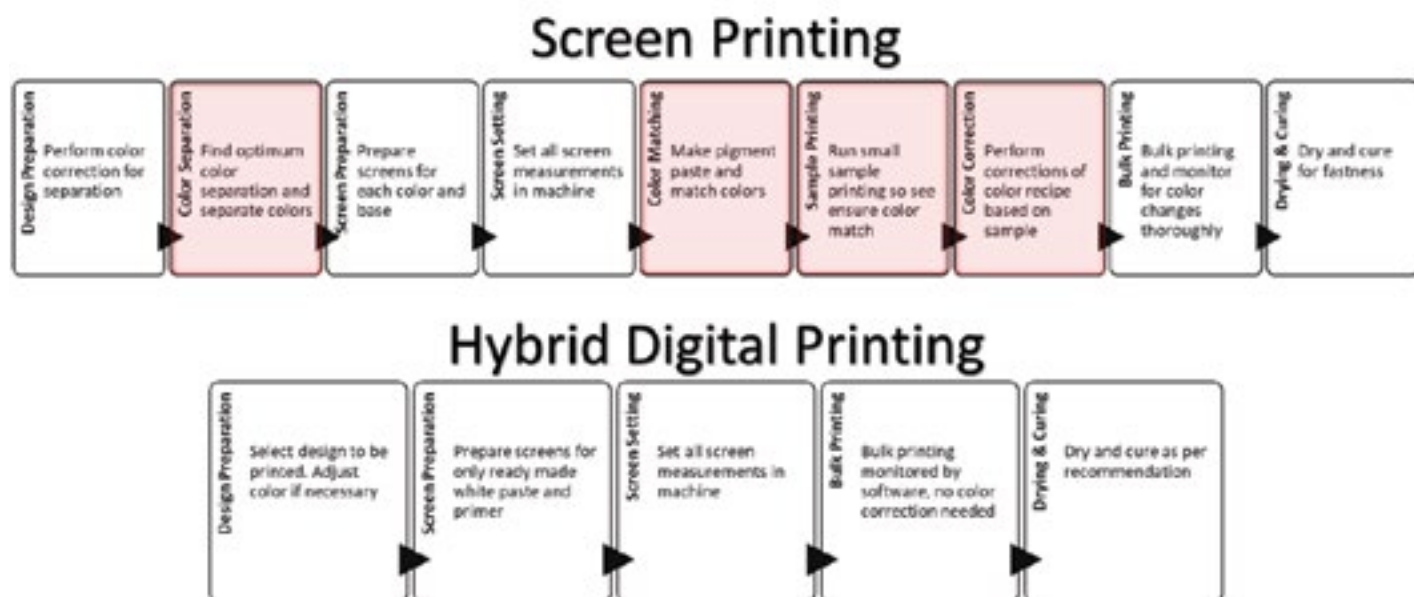


Digital printing handles complex designs with multiple colors with ease reducing the amount of screens needed for the print as well as saving time for setup

Using a screen printed underbase eliminates the need for time-consuming pretreatment, and expensive digital white underbase inks. M&R's hybrid printing process reduces the time, labor, and cost required by digitally printing alone, making small and mid-size print runs cost effective.



An eight-to-twelve-color screen print would typically require hours to perform separations, process and expose screens, mix inks, and register the press. The same screen print can be set up and printed on the Digital Squeegee in a fraction of the time with a minimal number of screens, greatly reducing art times that are normally associated with multi-color screen print jobs.



Hybrid prints can be embellished with specialty printing effects before or after the digital print, expanding creative possibilities by blending the best attributes of screen printing with the ease and detail of digital imaging.

- Efficiently Unleashing Human Potential**
- Streamline, Automate, Thrive, Succeed**
- More than 50% Flash Energy Saving**
- Up to 20% Time Saving in Printing**
- More than 50% Cost Saving in Screen Preparation**
- More than 25% Energy Saving in M/C Operation**

With some creative planning, a common screen-printed white underbase can be used with varying digital print data to produce completely different images in the same print run. It can also result in savings in the production process in various aspects. Digital Squeegee inks can be cured in conventional gas dryers, such as the Sprint® 3000, Sprint 3000 D, and Sprint 3000 DHZ

Algaeing™ and Birla Cellulose Join Forces to introduce Algae-powered fibre

■ M A Mohiemen Tanim

Imagine a world where fabrics shimmer with natural hues extracted from algae, where clothes decompose harmlessly after their lifespan, and where fashion embraces a future free from harmful chemicals and environmental exploitation. This vision, once relegated to the realm of science fiction, is now taking a giant leap towards reality thanks to a groundbreaking partnership between Algaeing™, a pioneer in clean textile innovation, and Birla Cellulose, a global leader in man-made cellulosic fibers.

This collaboration marks a pivotal moment in the textile industry, heralding the arrival of an innovative algae-powered fiber poised to disrupt the status quo. But what exactly is algae-powered fiber, and why is it such a game-changer?

Harnessing the Power of Microscopic Marvels

Algae, often dismissed as pond scum, are nature's tiny powerhouses. They thrive in diverse environments, grow rapidly, and possess remarkable properties that have long captivated scientists. Algaeing™ has harnessed this potential, unlocking the secrets within these microscopic marvels to create sustainable and eco-friendly textiles.

Their patented technology transforms algae into both fibers and natural dyes, eliminating the need for harmful synthetic materials and dyes that plague the conventional textile industry. This not only reduces reliance on petroleum-based products but also significantly shrinks the industry's carbon footprint.

A Symphony of Sustainability

The benefits of algae-powered fiber extend far beyond reduced environmental impact. Here's how this revolutionary technology is weaving a symphony of sustainability:

- **Biodegradable Bliss:** Unlike their synthetic counterparts, clothes made from algae-powered fibers decompose naturally when their time comes. This means no more microplastics polluting our oceans and landfills, contributing to a cleaner and healthier planet.
- **Renewable Resource:** Algae are incredibly fast-growing and require minimal resources like water and land compared to traditional crops like cotton. This makes them a sustainable and readily available alternative, reducing the burden on our planet's precious resources.



- **Skin-Friendly Sensation:** Ditch the itch! Algae-based fabrics are renowned for their softness and gentle touch on the skin. This makes them ideal for sensitive individuals and adds a luxurious feel to every garment.
- **Naturally Vibrant:** Say goodbye to harsh chemicals and embrace the beauty of nature's palette. Algaeing™'s natural dyes extract vibrant colors from algae, eliminating the need for harmful synthetic dyes that pollute waterways and endanger ecosystems.

A Powerful Partnership

The union of Algaeing™'s innovative technology and Birla Cellulose's expertise in fiber production creates a synergy that amplifies the impact of this revolutionary material. Birla Cellulose's vast experience and global reach will accelerate the development and scaling of algae-powered fiber, making it accessible to a wider audience.

Beyond the Fabric



Our collaboration with Birla Cellulose marks a significant milestone in our joint mission to detoxify the textile industry and promote sustainable innovation. Joining hands with a global leader like Birla Cellulose amplifies our impact, allowing us to bring affordable, superior products to consumers and branch into new industries. Together, we are carving a path for a brighter future, where fashion and sustainability seamlessly converge.

Renana Krebs
Co-founder and CEO of Algaeing™

The implications of algae-powered fiber extend far beyond the realm of fashion. This technology has the potential to revolutionize various industries, from medical textiles to home furnishings, offering a sustainable and eco-friendly alternative to traditional materials.

Algaeing™ and Birla Cellulose's collaboration sets

a powerful precedent for the future of the textile industry. It demonstrates that innovation and collaboration can pave the way for a more sustainable future, where fashion embraces environmental responsibility and clothes become a symbol of our commitment to a healthier planet.

Reebok and Futureverse launch AI-powered Metaverse platform

■ Ahosanuzzaman Roni

Reebok and Futureverse Team Up to Create Next-Gen Digital Fashion Experiences Reebok, the iconic sports culture brand, and Futureverse, the leading AI and metaverse technology and content company, have unveiled an exclusive partnership to create cutting-edge artificial intelligence, web3, blockchain gaming, and metaverse experiences for consumers. The partnership aims to revolutionize digital fashion by launching Reebok Impact in 2024, a digital shoe experience that will immerse mass consumers in artificial intelligence and digital wearables.

“We are beyond excited to announce our partnership with Reebok; a testament to our shared belief that life is a journey of active participation, not observation. This collaboration is a groundbreaking fusion of AI, web3, gaming, and metaverse technologies, set to transform how consumers define digital fashion. It's an invitation for consumers to step into a world in which their digital footprint is as significant as their physical one. Together, we're pioneering digital possibilities where every step tells a story, and every story shapes our world,” said Shara Senderoff and Aaron McDonald, co-founders of Futureverse.



Figure 1: In 2024, Reebok and Reebok Impact will create a mind- and heart-bending digital shoe experience that will allow mass consumers to dive into artificial intelligence and digital wearables.

Reebok and Futureverse share a vision of active life participation, as reflected in Reebok's motto “life is not a spectator sport” and Futureverse's “play-to-learn” approach. Their partnership aims to offer consumers new experiences that combine digital fashion, AI, web3, gaming, and metaverse technologies.

“Reebok is deeply entrenched in consumer trends and transformative technology,” said Todd Krinsky, CEO of Reebok. “Our ethos champions the principle of moving with purpose and stepping out into the world as a participant, not a spectator. At the heart of our brand is our vibrant

community and our efforts to weave their unique stories into the fabric of our products. Our partnership with Futureverse and the upcoming launch of Reebok Impact enables us to transcend traditional boundaries of innovation to engage our consumers in the digital evolution of our products in ways that redefine the realm of possibility.”

This partnership signifies the initial step in a long-term collaboration between Reebok and Futureverse, with plans to expand, enhance functionality, integrate new features, and introduce further groundbreaking experiences.

AI predicts shopper behavior for smarter retailing

■ Ahosanuzzaman Roni

AI has the potential to predict what shoppers will buy in the retail sector. By utilizing data analytics and machine learning, AI can analyze customer behavior, preferences, and past purchase history to make accurate predictions about their future buying patterns. AI technologies such as big data, facial expression analysis, and IoT can capture and analyze vast amounts of data from various sources, enabling retailers to better understand their customers. This data can then be used to perform predictive analysis and forecast consumer demand and behavior. However, it is important to note that AI in retail is still in its preliminary stage, and retailers need to strategically implement AI based on their specific business needs.

Examples of AI in Action in Retail

Sparkbox.ai Company is a retail planning, price optimization, and insights platform powered by machine learning. This Company helps busy merchandising teams make data-driven pricing and inventory decisions to improve profitability and reduce waste.

Sparkbox's team consists of former retail data experts and merchandisers. The team uses user experience to enable merchandisers to get value from data quickly and sustainably.

SandStar Retail Technology is an artificial intelligence company that provides leading computer vision technology for the retail industry. The company aims to make retail more efficient and profitable by using AI as the "eyes" and big data as the "brain". SandStar offers three solutions: 1) AI Vending Machine, 2) Smart Store, and 3) CV Unattended Shop (A low-cost vision system that recognizes actions semantically). These solutions help retailers reduce costs by 10%-70% and increase revenue by 10%-300%.

AI's Potential to Predict Shopper Behavior in Retail

A key insight for using AI in retail is that customers buy fashion items based on their feelings, newness, and product quality, so past sales data, even for similar products, has limited value. Additionally, it's important to note that AI forecasts are probabilistic, meaning they can have varying levels of confidence and need to be judged accordingly. Proponents of AI emphasize that the technology can still be more effective than



conventional methods and is best thought of as a way to support experienced merchandisers and creative teams, not replace them.

AI and machine learning are not just used for forecasting demand and setting prices; they are increasingly being leveraged to dynamically recommend products, personalize pricing, and predict individual consumer behavior. By analyzing massive and constantly evolving data sets, including purchase histories, product preferences, competitor pricing, and inventory, retailers can offer timely recommendations. Connected devices, such as smart assistants and IoT devices, further enhance the potential for predictive commerce.

Predictive commerce adapts to user habits and environments, making shopping seamless and personalized. However, retailers need to balance this with human-centered design, privacy, and trust. They must create engaging and transparent ecosystems that respect and reward consumers.

AI's Capabilities in Predicting Shopper Behavior

- 1. Data Collection:** AI gathers data from various sources such as transactional data, customer data, and environmental data.
- 2. Analysis:** AI utilizes data analytics and machine learning to analyze customer behavior, preferences, and past purchase history.
- 3. Real-time Decision Making:** AI can process and analyze data in real time, enabling retailers to make data-driven decisions on-the-fly. This facilitates

dynamic pricing, inventory management, and personalized promotions to maximize sales and customer satisfaction.

- 4. Continuous Learning:** AI systems continuously learn and improve over time. As new data is generated, AI algorithms adapt and refine their predictions to better align with changing customer preferences and market trends.
- 5. Simulation:** AI can run simulations using virtual AI shoppers to reveal behavior and preferences for various products and searches, enabling retailers to optimize website layouts and product displays.

By leveraging these capabilities, AI can accurately predict what shoppers will buy, enabling retailers to optimize their inventory, improve customer satisfaction, and increase sales.

Limitations of AI in predicting shopper behavior

- 1. Probabilistic nature:** AI forecasts are probabilistic, meaning they can have varying levels of confidence and need to be judged accordingly. Forecasts should come with confidence scores since a prediction might only have 40 percent confidence.
- 2. Overfitting:** AI models can learn irrelevant data in their training and can't make accurate generalizations

from new data. For example, the system might learn the performance of one red shirt so well that it can't make reliable predictions about a new batch of similar shirts.

- 3. Need for accurate data sets:** To make reliable predictions, AI needs precise data sets. The predictions will suffer if the data is faulty or missing.
- 4. Lack of transparency:** AI models can be difficult to interpret, and it can be challenging to understand how they arrived at their predictions. This lack of transparency can make it difficult for retailers to trust the predictions and make informed decisions.
- 5. Limited historical data:** AI models rely on historical data to make predictions. If there isn't enough historical data available, the predictions will be less accurate.
- 6. Emotion-driven purchases:** Fashion purchases are often driven by emotion, novelty, and the strength of the particular products.

Despite these limitations, AI-powered demand forecasting has been shown to improve the accuracy of forecasts, customer satisfaction, and logistics in the retail industry. Retailers need to strategically implement AI based on their specific business needs and be aware of the limitations of AI in predicting shopper behavior.



Trust Protocol's farm data exploration and key findings on soil carbon metrics

■ Mashia Sahejabin

Specific data and accurate measurements are important tools for US growers in improving cotton production and their environment. As the saying goes, you can't improve what you can't measure. Trust Protocol is keen to empower and develop farmers with this information.

The program annually provides data against six key environmental metrics and produces new reports measuring them. In an annual report through the 2021-22 fiscal year, aggregate data from U.S. farmers, including soil carbon content, is explored. But what does soil carbon measurement mean?

Soil carbon refers to the total amount of carbon in both organic and inorganic forms that is stored in the soil of a plant, such as natural fiber cotton. In fact, plants such as cotton absorb carbon dioxide from the atmosphere and store it in the soil carbon pool as they grow, thereby increasing soil carbon levels through the process of sequestration. Sunlight then synthesizes nutrients from carbon dioxide and water through photosynthesis. Plants then store the carbon in their leaves and roots, locking it in the soil, where it will remain for as long as the land remains free. Although soil carbon may not be the primary source of energy for most soil microorganisms, increased levels of soil carbon specifically support water infiltration, water, and nutrient holding capacity and increase crop productivity.

Soil carbon metrics are a USDA Natural Resources Conservation Service tool, calculated by the Soil Conditioning Index (SCI). The SCI



index ranges from -1.0 to +1.0. If the calculated index is a negative value, a decrease in soil organic matter levels is accurately predicted. However, if the index is a positive value, soil organic matter levels are predicted to increase under current production systems. Soil organic matter is extremely rich in soil carbon. Soil carbon is often measured based on how much organic matter is present in the soil.

The national target for soil carbon measurement in FY 2025 is to achieve positive SCI improvement of 30% of farmers. For the 2021/22 crop year, 70% of Trust protocol grower members were assigned a positive index value, meaning well-maintained soil health with high soil organic matter levels and an abundance of diverse soil microbiomes.

Healthy soil has many superpowers and provides the necessary nutrients to meet the nutrient needs of an environment and plants to thrive.

So now the question is – how can trust protocol farmers raise their soil carbon levels and take better care of the soil?

There are various steps and methods to ensure planting of cover crops when land is bare and susceptible to erosion prevention and practicing minimum and no-till systems to preserve soil structure and encourage biodiversity. In 2021/22, 82% of Trust Protocol land adopted conservation tillage, and 57% of acres were planted with cover crops which directly contributed to reducing soil erosion by 78% compared to the 2015 Trust Protocol baseline. Reducing soil erosion improves both groundwater and surface water quality, thereby reducing negative impacts on ecosystems.

US cotton farmers understand that in order to take care of the land, they must take care of it, and they are working hard to improve their environmental impact, including their soil carbon.

Diesel announces sustainable collaboration with Lee

■ Hasan Mia



Figure: Diesel Announces Collaboration with Lee Under Diesel Loves Initiative

Italian fashion brand Diesel has announced a collaboration with denim competitor Lee as part of its Diesel Loves initiative. This program, conceived by creative director Glenn Martens, aims to redefine brand collaborations by addressing overproduction through shared creative and manufacturing resources.

Diesel Loves is an open invitation to fellow brands, encouraging them to collaborate by sharing materials, manufacturing capabilities, and creative expertise. In a departure from traditional collaborations, Diesel plans to contribute its unsold stock to a joint creative team, inviting its collaborators to do the same. The result will be a unique limited-edition capsule collection crafted entirely from existing materials, embodying a true partnership between the two brands.

For each Diesel Loves collection, all profits will be donated to UNHCR, the United Nations Refugee Agency,

through the OTB Foundation—the philanthropic arm of Diesel’s parent company, which actively engages in various projects with UNHCR worldwide.

The inaugural collaboration under the Diesel Loves program features American denim company Lee. The limited-edition capsule collection showcases jeans with a distinctive twist—some pairs feature Diesel denim on the front and Lee on the back, while others reverse the combination. Each of the 3,000 pairs of Diesel Loves Lee jeans is a one-of-a-kind creation.

A preview of the Diesel Loves Lee capsule is currently available on Diesel.com for Europe and Japan, with the full collection set to launch in March 2024 on both brands’ websites. Through this initiative, Diesel aims to encourage positive change within the fashion industry and contribute to meaningful causes.

Key Highlights

- Diesel and Lee collaborate on upcycled denim collection
- Diesel Loves initiative tackles overproduction through creative reuse
- Limited-edition capsule features unique “half-and-half” jeans
- 100% of profits benefit UNHCR, the UN Refugee Agency
- Sets a precedent for collaborative, sustainable fashion partnerships

Minimalistic Fashion: A Philosophy of Elegance, Quality, and Sustainability

■ Homayra Anjumi Hoque



Figure: Minimalistic fashion for all body size of people

Minimalist fashion is a lifestyle choice that involves wearing fewer clothes and accessories but with more specific intentions. It's about creating a wardrobe of quality, curated pieces and also feeling comfortable. This encourages people to think carefully about what is truly necessary, rather than just buying for the sake of buying. Minimalist fashion rejects the chaos caused by fast fashion, specifically the widespread water pollution caused by the use of cheap and toxic dyes and textiles matters.

Minimalism encourages individuals to eliminate unnecessary clutter and keep only items that bring value and joy. In fashion, the principle of minimalism involves keeping a minimal amount of clothing that fits personal style and promotes personality. By embracing minimalism,

individuals can challenge the relentless discourse of consumerism, reduce stress, ease financial burdens, and contribute to a more sustainable future.

Benefits of Minimalistic Fashion

- Having fewer clothes to choose from means less decision fatigue in the morning and spending less time thinking about what to wear for the whole day.
- Less clutter in the closet, which helps reduce stress and overwhelm and makes cleaning a lot easier.
- When anyone has fewer clothes they can easily take better care of their pieces, making them last longer.
- It can end up saving a lot of money.

- Decluttering the excess can also help anyone discover their style as he/she starts to understand what it is like wearing and feel comfortable.

Why Minimalistic fashion is to be chosen over Fast fashion

Environmental concern

Fast fashion is a term that describes the mass production and consumption of cheap, trendy, and disposable clothes. Fast fashion hurts the environment, the workers, and the consumers. A study showed that Fast fashion is one of the most polluting industries in the world. It consumes a lot of water, energy, and chemicals, and produces a lot of waste, emissions, and microplastics. According to the United Nations, the fashion industry is responsible for 10% of global carbon emissions, 20% of global wastewater, and 24% of insecticides.

Minimalistic fashion enhances personal well-being:

Fast fashion is not only harmful to the environment and the workers but also to the consumers. Fast fashion creates a culture of overconsumption, dissatisfaction, and stress. Fast fashion makes consumers feel pressured to keep up with the ever-changing trends, to buy more than they need, and to discard what they have.

Minimalistic fashion, on the other hand, enhances the personal well-being of the consumers. By having a minimal amount of clothes that fit their style, personality, and values, minimalistic fashion lovers feel more confident, comfortable, and authentic. They also feel more satisfied and happy with what they have, and less tempted and stressed by what they don't.

Less is more- The mantra of minimalist fashion

It's a movement that embraces simplicity, quality, and sustainability. Minimalist fashion lovers curate their wardrobes with care, choosing pieces that are timeless, versatile, and ethical. They resist the temptation of fast fashion, which floods the market with cheap, trendy, and disposable clothes. Fast fashion harms the environment, exploits workers, and creates waste. Minimalist fashion, on the other hand, respects the planet, supports fair trade, and reduces clutter. Minimalist fashion is not a trend, but a lifestyle.

It is a way of dressing, thinking, and being that values substance over style, and quality over quantity.

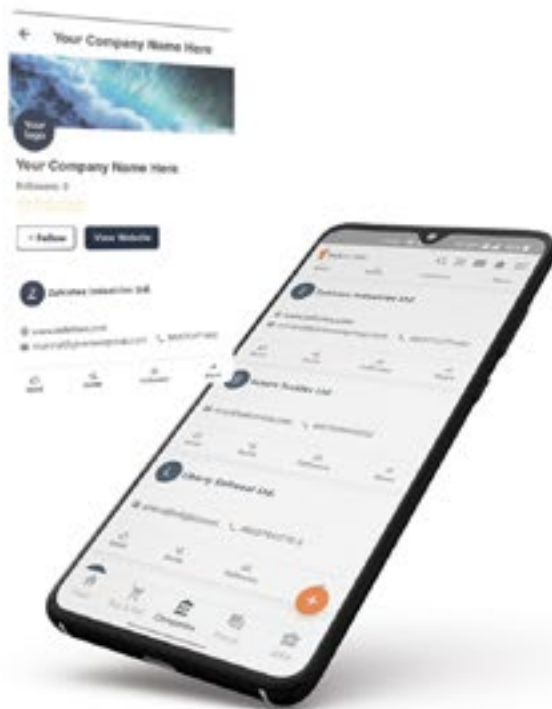
Brands that are practicing minimalistic fashion trends

- 1. Armedangels:** German brand Armedangels's quality and long-lasting pieces are made from lower-impact and certified materials, like Global Organic Textile Standard (GOTS) certified cotton.
- 2. NAE:** NAE is a Portuguese footwear, bags, and accessories brand using innovative materials to create goods with "No Animal Exploitation". Its lower-impact materials include recycled PET from bottles, OEKO-TEX® certified microfibres, recycled car tires, natural cork, etc.
- 3. A.BCH:** A.BCH is a Melbourne-based, Australian-made fashion label that utilizes renewable, organic, and recycled materials.
- 4. Mila.Vert:** Mila.Vert offers timeless, minimal, and chic clothing, adding sophisticated details that give the garments a modern feel.
- 5. CARPASUS:** CARPASUS is a Swiss menswear brand that makes fine shirts, ties, socks, and pocket squares. CARPASUS uses GOTS-certified cotton and manufactures locally to reduce its carbon footprint.
- 6. Colorful Standard:** Colorful Standard is a Danish clothing brand that makes organic fashion essentials for men and women that are also minimalist and chic.

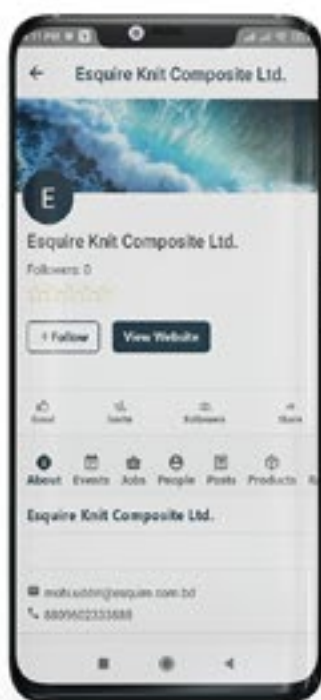


Figure: Minimalistic fashion have been the new trend

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Create Your

Profile

Create & build your profile

Events

Create & Join events in a single place.

Buy & Sell

A dedicated marketplace to buy & sell products.

Jobs

Post jobs easily and get the right professionals.

Post

Share thoughts or views with people of the same interest.