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WSA

PERFORMANCE & SPORTS MATERIALS

Down alternatives on the up

Plant-based ideas keep growing

Garment invents a new product category

Dialogue: Katrin Ley, Fashion For Good

THE INTERNATIONAL MAGAZINE FOR PERFORMANCE & SPORTS MATERIALS

Contents



Front cover:

When The North Face uses down in its products it commits to sourcing material that complies with the Responsible Down Standard. But responsible down products make up only a small portion of the global down market.

IMAGE: SILVANO ZEITER / THE NORTH FACE

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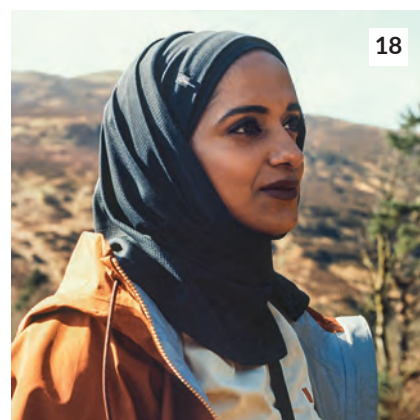
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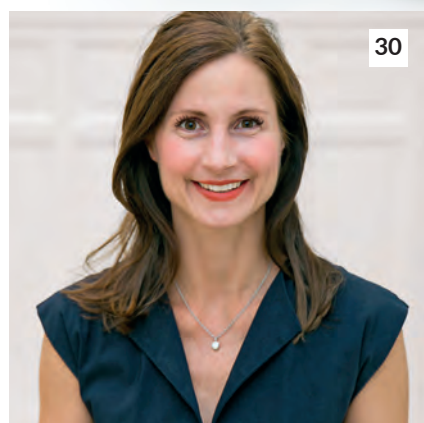
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Global news

France JD Sports has entered into exclusive negotiations with the owners French sports retail group Courir and has said it aims to complete an acquisition valued at €520 million. In accordance with French law, Courir management will now commence consultation processes with employee representative bodies prior to being able to enter into a binding agreement for the transaction. The transaction will also need to be notified to the European Commission in accordance with European Union law. Completion is conditional on receipt of merger control approval but JD Sports said it remained optimistic about completing the acquisition before the end of this year.

UK Sheffield Hallam University is to launch a new one-year master's programme, MA Design for Performance Sports, targeted at qualified graduates of fashion, product or industrial design courses at bachelor's level. Programme leader, Dr Emma Jenkins, said the full-time course had been developed alongside industry experts and is intended to hone students' skills, knowledge and experience in preparation for a specialist, yet versatile, design career in the sports and outdoor industry. The first intake will join in September.

Portugal Portugal's national textile and apparel association, ATP, has reported export values of just over €1 billion for the industry in the first two months of this year, an increase of 1% year on year. The figure includes revenues from exports of finished apparel and home textile products, as well as of fabric, yarns and fibres. ATP calculated a total export volume of 83,000 tonnes for these products over the two months. These totals represent an increase in revenue of 1% year on year, but a fall in volume of 12%.

Norway Outdoor brand Norrøna has launched a new trail-running collection, naming it Senja after an island off the coast of northern Norway. It described the collection as a set of lightweight, packable, weather-protective trail-running garments with high levels of moisture management. Products in the collection include hooded tops, socks, stretch tights, lightweight T-shirts, jackets, shorts, a body-hugging vest pack and a cap. The brand's product designer, Sara Lanyon, said the company had sought to "push each product design as far as it could go".

Austria A newly formed industry consortium has inaugurated "Austria's largest textile recycling project", with partners working together to funnel used textiles through sorting, recycling, processing into pulp and, ultimately, new lyocell and viscose fibres. Beginning with Salesianer Miettex, responsible for gathering all waste unfit for reuse, the next link in the chain, Altstoff Recycling Austria (ARA), will subsequently deliver the textiles to charity organisation Caritas Austria, where people with disabilities will be employed to sort through the waste by hand.

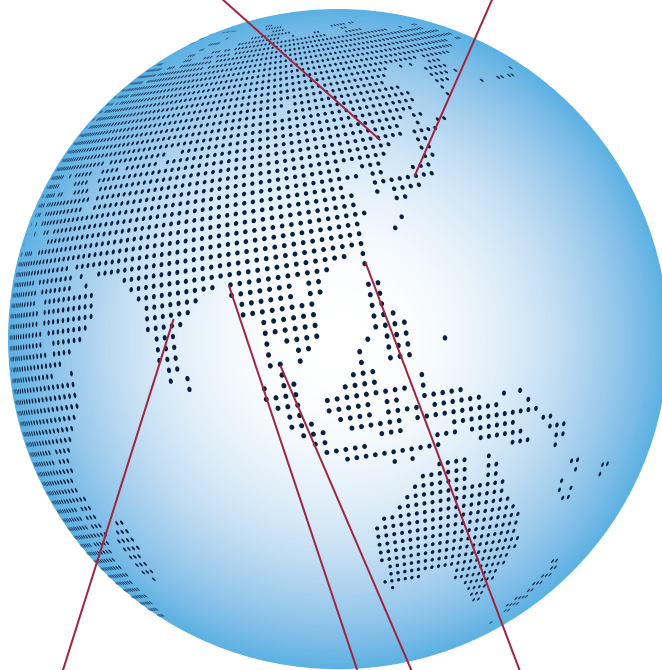
Switzerland Sporting goods retail group Intersport has won the right to acquire French group Go Sport. Founded by Bordeaux-based entrepreneur Michel Ohayon, Go Sport operated more than 80 sports stores in France, with 87 others run as franchises. It had almost 50 other franchised stores operating outside France. It went into receivership in January and the French courts gave interested parties until April 18 to submit bids for the business. On April 28, a court announced that a bid that Berne-based Intersport had submitted in partnership with Qatari group Al-Mana had won.

Egypt Technical textile developer Ventile has formed a joint venture with the Egyptian Biodynamic Association (EBDA) to support the latter's 2,380 membership in making the transition to organic and biodynamically cultivated cotton. Ventile said its ongoing support would enable the non-profit to assist more farmers in implementing soil-healthy regenerative farming methods, free from harmful artificial inputs and genetically modified organisms or GMOs.

China Nike has revealed plans to develop an “eco-sports field” in China’s southwestern Yunnan province. The project and its associated initiatives, including the on-site recycling of pre-worn athletic footwear, will fall under the theme Spread Your Wings. Local media have said the main objective is “to inspire more girls to get active and unleash their potential through sports”.

Japan Industrial group Toray has posted revenues of around \$18 billion for its most recent financial year, the 12 months to March 31, 2023, an increase of 11.7% year on year. Its fibres and textiles business unit was the biggest contributor, with revenues equivalent to \$7.2 billion, a rise of 19.5%. Performance chemicals was next biggest with revenues of \$6.5 billion, a slight decrease compared to the previous year.

US Building on the recent sale of its Keds brand and the pending licensing of Hush Puppies, footwear group Wolverine has said it is now “exploring strategic alternatives” for another of its brands, Sperry. It sold Keds in February to Designer Brands. The same buyer acquired an exclusive licence for Hush Puppies in the US and Canada. Wolverine has also been trying to find a buyer for its leather sourcing division, Wolverine Leathers, but without success so far.



India Cotton industry information resource Cotlook has reported disappointing news about crop forecasts in India. In its review of global cotton production for the month of April, Cotlook said current forecasts for India’s next cotton crop will be 30.5 million bales. At the time of sowing, it said optimism abounded in India. There was a planted area of more than 12 million hectares. In the face of an apparently benign pattern of Monsoon rainfall, early forecasts were for an output of above 35 million bales.

Myanmar Trade union organisation IndustriAll Europe wrote to the European Parliament ahead of a debate on trade with Myanmar on May 10 and 11. This was the fourth debate the European Parliament had held about the situation in the Asian country since a military coup there in 2021. IndustriAll called for action from garment brands in the European Union, saying they should stop sourcing apparel from Myanmar and that consumers in Europe should stop buying apparel made in the Asian country.



Brazil Brazil’s main cotton producers’ representative body ABRAPA has said that the country’s harvest for the marketing year 2022-2023 is likely to exceed 3 million tonnes of fibre for only the second time in the industry’s history. Current projections point to a crop of 3.1 million tonnes, which would represent an increase of 18.2% year on year. The only other marketing year in which Brazilian cotton farmers achieved a yield of more than 3 million tonnes was 2019-2020.

Peru A total of 21 textile industry leaders from Peru and Colombia visited Spain in March to discuss possible joint-working with partners in Europe, including participation in formal European Union textile projects. Companies from the Bogotá chamber of commerce and from Peru’s sustainable fashion cluster held meetings in Madrid, Alicante Valencia and Catalonia.

Taiwan The Taiwan Textile Federation (TTF) has arranged for ten of its member companies to be present in a special Taiwan pavilion at the ITMA exhibition, which takes place in Milan, June 8-14. Participants will include Formosa Chemicals and Fibre, Everest Textile, Taiwan Taffeta, Far Eastern New Century and Shinkong Synthetic Fibers.

Malaysia Fibre developer Toray has launched a new initiative with schools in Penang in Malaysia to collect used water bottles for recycling. Toray will process the bottles into flakes and chips, which it will then use to make recycled polyester staple fibre. The recycled polyester will be spun and woven into fabric locally for clothing. The company has organised a competition to see which school can collect most bottles.

Industry & Innovation

'Infinite' polyester is Lululemon's aim

Athletic brand Lululemon has become a minority investor in Samsara Eco, an Australia-based developer of plastic-eating enzymes. Its hope is that the technology will allow it to break its nylon and polyester performance apparel back down into monomer form for "infinite" textile-to-textile recycling. The investment is the first of its kind for the company.

"Nylon remains our biggest opportunity to achieve our sustainability goals," commented Lululemon's vice-president of raw materials innovation, Yogendra Dandapure. "Through Samsara Eco's patented enzymatic process, we're advancing [the idea of] transforming apparel waste into high-quality nylon and polyester, which will help us move into our end-to-end vision of circularity."



CREDIT: SAMBARA ECO

Biobased advances in sight

Biobased materials developer Origin Materials has signed a new strategic partnership with polyester fibre manufacturer Indorama Ventures. The two companies will work together to "explore initiatives related to the rapid commercialisation of low-carbon, biobased materials", they said.

One early step will be to evaluate production plants that Indorama already has in place in the US to assess their potential, with some modification, for the commercial production of biobased materials. Under this arrangement, Indorama would convert derivatives of Origin Materials' platform chemical, chloromethylfurfural, into sustainable chemicals and biobased plastics.

Partnership agreements

The Hong Kong Research Institute of Textiles and Apparel Limited (HKRITA) has signed two new partnership agreements.

Under the new agreements it will work with research partner Shinshu University and with industry partner Seiko Epson Corporation.

HKRITA signed the agreements separately, but both of its new partners have their headquarters in Nagano prefecture in central Japan.

Its relationship with Shinshu University began in 2013, when it started working with a dedicated Fibre Innovation Incubator at the Japanese institution. It renewed this agreement in 2018 and has now renewed it once again to take the partnership into its second decade.

Its new partnership with the Seiko Epson Corporation will aim to advance research and collaboration in material recycling, HKRITA said.

Dyeing first

Indian apparel brand Killer has achieved an industry first by successfully treating CovationBio's polymer Sorona in a hank-dyeing process for the first time. In this process, the yarns are loosely arranged in skeins or hanks and immersed in the dye-bath.

Killer has used Sorona in shirting material for its latest collection. It said Sorona had given the fabrics a high enough level of two-way stretch, removing the need for spandex in the fibre mix. Comfort, moisture management, "luxurious drape and a superior hand-feel" in addition to vibrant colour and "outstanding stretch and recovery" were the performance qualities the Indian brand highlighted.

For its part, CovationBio pointed out that because Sorona polymer is made from 37% annually renewable plant-based ingredients, it offers "a high-performing, responsibly sourced material option".

Cotton origins

Textile testing solutions provider Eurofins has launched a new cotton origin-verification testing service. The move comes two years after Eurofins won approval from the International Standards Organisation for its proficiency in testing organic cotton. Its new service will use analytical techniques including Stable Isotope Ratio Analysis (SIRA), to determine if a cotton sample is consistent with the claimed origin, based on its environmental signature.

Seed funding

US start-up Werewool has achieved \$3.7 million in seed funding in a round led by venture capitalists Material Impact and Sofinnova Partners. The company develops plastic-free, naturally coloured and inherently fluorescent "regenerative" fibres by brewing custom-engineered proteins using microbes. It says its patent-pending platform technology can help circumvent the use of extractive raw materials and harmful dyestuffs, although it does not currently reveal the composition of its fibres.

Protein shake

A team of researchers at the McKelvey School of Engineering at the University of Washington in St Louis, has found a way to use sticky mussel foot protein fragments to generate higher-yield synthetic spider silk proteins. The team said "the outstanding mechanical properties of natural spider silk" come from its large, repetitive protein sequence. Mussel foot proteins, which are intrinsically disordered, can be placed at the ends of protein sequences to create new spider silk fusion proteins. These are said to have eightfold higher yields than recombinant silk proteins.

eVent spills the beans on Bio

Membrane technology developer eVent has used the first-quarter schedule of industry events to showcase a new product, Bio, that contains bio-based material. It said castor beans provided the renewable material component in its construction and that the product was still able to provide all-weather protection and performance. It described the Bio membrane as light, tough and flexible, with a reduced carbon footprint and recyclability.

People

Archroma CEO announces departure

Textile chemicals group Archroma has announced that its chief executive, **Heike van de Kerkhof**, left at the end of April. It said Ms van de Kerkhof had decided “to focus on other career opportunities”. She took up the role in January 2020.

Archroma brought in **Mark Garrett**, who has previously held senior roles at DuPont, Ciba and other chemicals groups, to be its interim chief executive, and said its search for a new, permanent chief executive was underway.

Chairman, **Miguel Kohlmann**, said Heike van de Kerkhof had been successful in “meaningfully advancing the company’s sustainability, innovation, and customer-focused business model”, while also closing the acquisition of Huntsman’s Textile Effects business earlier this year. 🌐



CREDIT: ARCHROMA

Sudden name-change for Higg Co is no surprise

The Higg Index, developed by the Sustainable Apparel Coalition (SAC) to help companies in the apparel and footwear value chain measure sustainability, is now to be hosted under a new company name, Worldly.

In an announcement on May 16, Worldly said that it had been set up as long ago as 2019 to be a platform for hosting the Higg Index. In the announcement, Worldly stated it was “the exclusive licensee of the Higg Index”.

SAC’s website lists press releases for 2019, but does not include an announcement on the setting up of Worldly. What it does make clear is that, in 2019, SAC launched Higg Co as a spin-off and **Jason Kibbey**, who had been SAC chief executive since 2014, moved to become chief executive of Higg Co. Mr Kibbey is now chief executive of Worldly and his profile on LinkedIn says that he has been since 2019.

What seems most likely, then, is that Worldly is simply a new name for Higg Co, although the May messages fail to spell that out.

The SAC website does not include the May announcement; in fact, the website does not mention Worldly once. **Amina Razvi**, who took over the running of SAC from Jason Kibbey in 2019, first as executive director and, from 2022, as chief executive, published a blog post on May 16, devoted to ‘30 x 30’, the goal to put aside 30% of the world for nature by 2030. She mentioned the Higg Index, but even here did not name Worldly or explain the change in the set-up.

If SAC were intent on putting some distance between itself and the Higg Index, it would come as little surprise. In 2022, the Dutch and the Norwegian consumer authorities jointly published new guidance to the textile industry. They focused on clothing companies’ use of the Higg Index in presenting their claims about the environmental credentials of their products and raised a number of objections over the way the Higg has worked until now. 🌐

Fashion Pact role for H&M chief executive

The chief executive of retail group H&M, **Helena Helmersson**, is the new co-chair of the Fashion Pact.

Thirty-two luxury, fashion and textile companies launched the Fashion Pact in 2019, signing a commitment to protect climate, biodiversity and the oceans of the world. H&M was one of the original 32 signatories, along with Decathlon, Moncler, Nike, Ruyi, Puma, adidas and others. Ms Helmersson replaces the chief executive of luxury group Kering, **François-Henri Pinault**. Former chief executive of Unilever **Paul Polman** is the Fashion Pact’s other co-chair. “We need to work together to tackle challenges that one company alone can’t solve,” Helena Helmersson said. 🌐

Shift at Toray

Japanese industrial group Toray has announced **Mitsuo Ohya** as its new company president. Mr Ohya will take up the role in June. Mitsuo Ohya, a former general manager of the group’s industrial and textile fibres division, joined Toray in 1980. He became its executive vice-president in 2020. He will take over from **Akihiro Nikkaku** as president; Mr Nikkaku will become the group’s chairman.

Leader bids farewell

Fibre group Indorama Ventures has bid a “fond farewell” to **Uday Gill**, who has now left the company after 16 years of service, most recently in the role of chief strategy officer following 13 years as chief executive of its fibres division. He had also been executive director of the board since 2011, as well as a member of its sustainability and risk management committee. The company described Mr Gill as a caring and extraordinary leader.

In the chair

Yarn producer Aquafil, maker of Econyl recycled nylon 6.6, has appointed **Chiara Mio** as its chairperson until 2025. Ms Mio, known for her focus on sustainability, is a professor at the University of Venice and is also on the board at Banco BPM. From 2014 to 2022 she was chairwoman of Crédit Agricole FriulAdria and has previously chaired the ESG Reporting Task Force at Accountancy Europe in Brussels. Aquafil supplies to sportswear and swimwear brands, and uses ghost fishing nets and carpet as a raw material for some of its yarns.

Senior appointment at Stanbee

Footwear components developer Stanbee has appointed **David Hapeman** as its new director of sales for North America. He will be based in the company’s Portland office and report directly to chief executive, **Michael Berkson**. Mr Hapeman was, most recently, general manager for the north-west for Coats Footwear, working with brands including Texon and Rhenoflex. Before that, he served on a number of leadership teams at Nike. 🌐

Backtrack

23.05.2023

OIA sees 'multi-generational mind shift' around spending time in nature
Step forward for adidas Yeezy inventory

22.05.2023

Deuter and Ortovox eye US growth with corporate move

19.05.2023

Sales figures "soften meaningfully" for Foot Locker
Hyosung FDC looks forward to spring-summer 2025

18.05.2023

Asian demand provides tailwinds as Canada Goose changes direction
Pou Yuen Vietnam lets go of another 6,000 workers

17.05.2023

Record quarter for On
Better Cotton appeals to US body to not rely on LCAs
Goldman optimistic about China's sports market

16.05.2023

Record year for Mizuno
Nigerian brand scoops International Woolmark Prize
Squatwolf looks to TDry for 'sustainable innovation'

15.05.2023

Exploratory mission to Japan for Techtera
Footwear boosts Under Armour
Y-3 enters performance wear arena

12.05.2023

Wool industry carbon emissions on the way down in Australia
Good news for Chinese dyeing and printing in March

11.05.2023

First sustainability report from CovationBio

10.05.2023

Softer demand and high inventory hurt Yue Yuen
Renewcell to link up with TextileGenesis
Out of the frying pan and into the dyer

Limitations on space make it impossible for us to run more than a carefully selected sample of industry news in WSA. However, we publish hundreds more stories on www.sportstextiles.com, one of the most comprehensive archives of news anywhere on the web for textiles, apparel, footwear and equipment for sports and outdoor. Below are just some of the headlines that have appeared on the site in recent weeks.

09.05.2023

Demand drives expansion for Fuze Biotech
361 Degrees doubled offline sales this Labour Day

05.05.2023

Footwear growth fails to compensate adidas for Yeezy downturns
Fifty-plus brands join Shanghai sports market event
Good start to 2023 for OrganoClick

04.05.2023

Sport climbing looks forward to Chengdu event
Guess shuns plastics to add sparkle to new collection

03.05.2023

Unifi names Champions of Sustainability
Lenzing revenues suggest market recovery, it says
Diversified business model works for Columbia

02.05.2023

Partners present workshop on circularity to industry figures in India
Seoul's Xexymix opens first offline store in China
Record-breaking Rossignol sets circular ambitions

28.04.2023

National Geographic expands in Asia-Pacific
Vaude voices support for PFAS restrictions
DS Printech China confirms almost 200 exhibitors

27.04.2023

Anta publishes supplier sustainability management handbook
Cotton harvest gathers pace in Australia
Footwear sales give Puma a leg-up in transitional year

26.04.2023

Gold for ASICS app at iF Design Awards
Lenzing celebrates first batch of China-made Tencel modal
Sixth award for HKRITA's Green Machine
Cotton stalks improving soil health across Asia and Africa

25.04.2023

Registrations open for Textile Institute World Conference
Binder product from OrganoClick earns TÜV certification
Factory fire warnings coincide with Rana Plaza anniversary

24.04.2023

Architecture inspires new version of New Balance shoe
Tmall reveals its top three outdoor brands for sales
Textile Exchange: Change not happening fast enough to reach goals

21.04.2023

Only 4% of adidas brand polyester now not recycled

20.04.2023

Innovation recognition for Dovetail Workwear and Cordura
Shanghai show traffic suggests China is 'back to business'
Oeko-Tex launches organic cotton certification

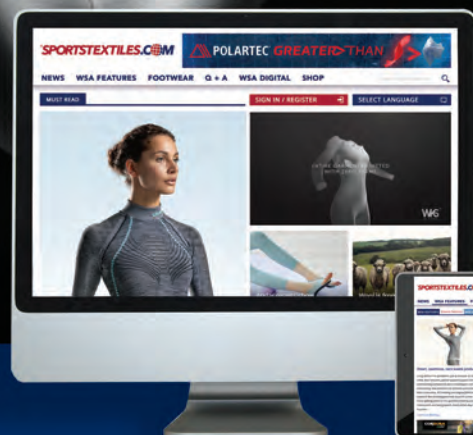
19.04.2023

Celliant stretches to kinesiology tape
HKRITA separates microplastics with sound waves

18.04.2023

Ring yarn producer added to CLASS Material Hub
Better Cotton to trial tracing technologies

take ADVANTAGE



Initially positioned for the fashion market, Tencel lyocell was found by Lenzing's R&D department to have many properties suitable for active sportswear: a smooth surface, a cooling effect, bacteria resistance and moisture absorption throughout the fibre.

CREDIT: LENZING

Can cellulосics compete with synthetics?

When Swiss chemicals company HeiQ announced the launch of its first fibre technology, AeonIQ, it boldly proclaimed that this cellulosic yarn derived from 'climate positive' raw materials could be a viable alternative to conventional synthetics. Shortly afterwards, Austrian manmade cellulosic producer Lenzing launched a programme promoting its Tencel lyocell fibre as a "sustainable and circular solution" for outdoor and activewear. These claims go against common practice in performance sportswear where polyester, and to a lesser extent polyamide, have long been the go-to raw materials for apparel designed to manage moisture, protect from the elements and keep wearers comfortable in their active pursuits. To see if the viable alternative theory has any legs, a panel talk at Performance Days in April brought together representatives from HeiQ, Lenzing and Optimer, the maker of Drirelease, which specialises in performance yarns made from blends of synthetic and non-synthetics.

Petrochemical fibres have progressively come to dominate fabric compositions for apparel

Producers of manmade cellulosic fibres would like us to believe their wood-based yarns possess performance properties that make them suitable alternatives to polyester and polyamide. Does this theory have legs? Should sports apparel brands reconsider their fibre choices, or not?

applications. Synthetics made up 64% of global production in 2021, with polyester representing roughly 54% and nylon nearly 6% of all textile fibres produced. The share of manmade cellulosic fibres was 6.4%, including 5% for viscose, as per the Textile Exchange's Preferred Fibre & Materials Market Report for 2022. The document does not break down usage by market, but it can be surmised that the proportion of synthetics in activewear would be higher, possibly in a range of 70% to 75%.

However, the manmade cellulosic fibres (MMCFs) landscape is ever evolving, with the arrival of new players on the market, such as Renewcell, Infinited Fiber Company, or even Spinnova, in addition to HeiQ. This family of fibres derived from cellulose pulp is also considered an alternative to cotton that could be more sustainable and less taxing on natural resources. For these reasons, among others, MMCF production is projected to rise to 10 million tonnes in the next 15 years, up from 7 million tonnes made in 2021. This prospect is not unanimously viewed as a good thing. Canopy, a Canadian NGO, says that more than 300 million trees are logged every year to manufacture cellulose pulp for fibres and fabrics.

The matter of cost

Synthetics are economically mass-produced, as Aswin Jaju, general manager for Drirelease, says, and this is the first reason evoked to explain their widespread use in activewear and beyond. "Furthermore, their primary property is hydrophobicity, they do not absorb water, they dry fast, and thus provide comfort. This is why synthetics excel in performance clothing," he says. However, he notes that the rise of athleisure has favoured fabrics having a softer, more natural hand-feel, and "this is where regenerated cellulosic fibres come into play".

The low price of polyester is the result of years of investment in developing efficient industrial-scale processes, which have also been directed at the recycling of PET plastics into polyester fibres to address activewear brands' growing demand for recycled materials.

Lenzing has been manufacturing fibres derived from wood pulp for 80 years now, points out Andreas Gürtler, the company's senior manager for functional wear. It has also optimised its processes over the years. It introduced Modal in the 1960s, which he describes as a "modified viscose fibre" (Modal for modified) having a higher wet modulus and better strength. "Our latest generation fibre is Tencel lyocell, which is produced using a non-toxic solvent," he says. The name Tencel, he adds, refers to tenacity, implying it is a stronger cellulosic fibre. "It has a round cross section," he adds. This gives it a smooth surface that bacteria do not attach to. "It is also antistatic, which makes it a good partner for blends with synthetics, as it discharges static electricity."

HeiQ announced the launch of its cellulose-based fibre in late 2021. Carmen Danner, director of business development, says it will be cost-competitive when production reaches industrial scale, expected in late 2025. "It is a matter of scaling up feedstock and the manufacturing process. When we achieve mass volumes, prices will be lower, like polyester," she says. HeiQ's process and non-toxic biobased solvent are different from conventional manmade cellulosic fibres, she adds, without revealing more details. HeiQ AeonIQ is currently available in limited quantities and Hugo Boss introduced a first commercial product made from it earlier this year.



The first commercial product to feature HeiQ AeonIQ is a polo shirt made by German apparel brand Hugo Boss.

CREDIT: HUGO BOSS

What about wicking?

The wicking and fast-drying properties of synthetic fibres make them ideal for activewear goes the consensus. Following this logic, the high moisture absorption of cellulose-based yarns would make them unsuitable for performance sports apparel, but this thinking may be ripe for re-evaluation.

Founder of fabric developer Concept III, David Parkes, worked with Performance Days founder Marco Weichaert, to help Lenzing develop the first Tencel-based outdoor fabrics collection. He points out that Tencel possesses genuine thermal properties and moves moisture away from the body. "It has very nice aesthetics," Mr Parkes says, "it brings a lot of body to a textile and drapes well. The industry is concerned about rPET availability in the years to come and needs a replacement for polyester. Tencel could be that fibre," he says.

Lenzing explains that Tencel lyocell's ability to absorb moisture throughout its structure endows it with functional and comfort properties. The sub-microscopic canals between the fibre's nanofibrillar structure are said to regulate the absorption and release of moisture. "Due to the porous structure of the lyocell fibre, moisture is distributed throughout the fibre. It won't feel wet, and in combination with other fibres, it moves moisture away from the body," says Mr Gürtler. To achieve best results, he says Tencel lyocell should be combined with a suitable "partner fibre", which can be cotton, hemp, wool or polyester. Double-layer knits are cited as a fabric construction that will speed up wicking. "In most cases, for performance apparel, we see Tencel lyocell as a blending partner for other fibres," he says.

HeiQ has yet to test AeoniQ's functional characteristics for activewear applications. Ms Danner says it will have properties similar to cotton, and these can be modified by finishing. "We are working on a permanent solution," she tells WSA, and the project is only 15 months old, she points out. The first commercial product, launched with HeiQ's brand partner Hugo Boss, is a next-to-skin polo shirt. A series of citywear fabrics, developed with Italian weaver Beste, were exhibited at Milano Unica in February. "AeoniQ can be used in a wide array of woven or knitted products. At the moment, we do not see any limitations," she says. She also suggests that a yarn can be given different performance properties during spinning.

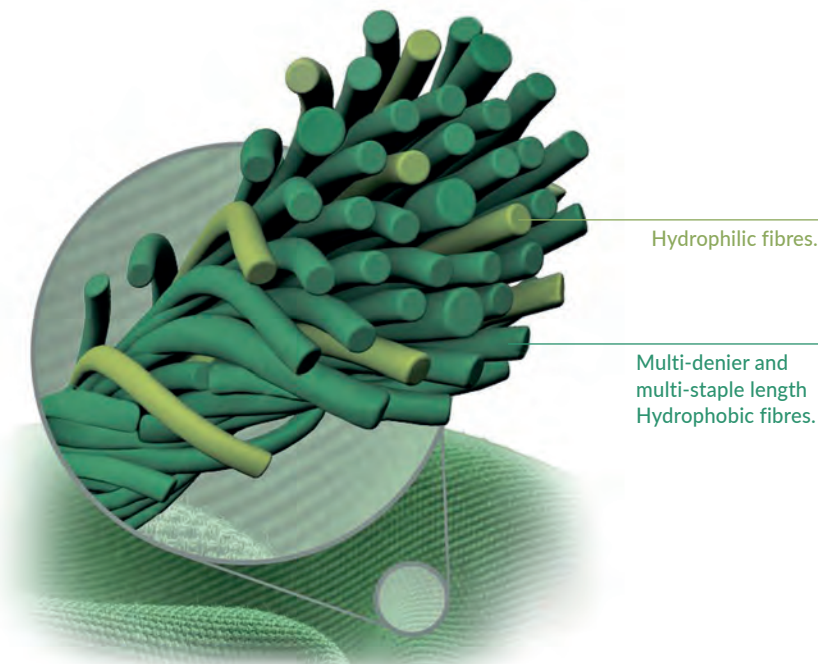
Sophisticated spinning

Drirelease performance fibres are based on "an optimised blend of hydrophobic materials, primarily synthetics, that we combine with a small amount of natural fibres to boost wicking and offer fast drying properties," says Mr Jaju. The inherent comfort of cellulose-based fibres, such as cotton, is due in part to the subtle variations in texture of the natural fibre. "We try to mimic those natural variations by incorporating multidenier and multistaple polyester fibres within the yarn," he explains. Drirelease yarns are generally made from blends of 85% to 90% polyester or nylon combined with 10% to 15% natural or cellulosic fibres. This proportion, he says, "provides the optimum balance of wicking and fast drying. The natural or plant-based fibres channel moisture within the yarn structure, and the hydrophobic fibres drive that moisture out, in a push-pull system without any chemical finish. Because these properties are engineered in the fibre blend, the yarn offers permanent performance."

In addition to cotton and lyocell, Drirelease yarns are now available in a host of other fibre compositions, including hemp. The newest product in the range incorporates recycled cotton, from Recover. The next one to come will be a blend with a pineapple fibre, supplied by a company based in Thailand. Optimer has recently expanded its hydrophobic-hydrophilic concept with a new technology called Dricomfort Geo. "We enhance the performance of filament polyester and nylon fabrics that are hydrophobic by adding a mineral particle infusion that is hydrophilic. This mineral particle infusion provides the channel to absorb moisture and heat drives the humidity out at a faster rate," Aswin Jaju tells WSA.

Biodegradability & recyclability

Moisture management and wearer comfort thus appear to be obtainable and controllable via fibre blend, spinning or finishing. But in a market increasingly driven by eco-responsible concerns, brands and their buyers also seek to offer product ranges that have a 'clean' end of life. This holistic vision could give cellulose-based materials the upper hand when considering biodegradability or recyclability. Both Lenzing



and HeiQ have tested their fibres' ability to disintegrate in soil. Lenzing has found that a Tencel lyocell knitted fabric will decompose completely in 14 weeks in compost, and similarly disintegrates in sea water, in tests conducted off the coast of San Diego. HeiQ's in-house laboratory has found that a cellulose-based knit made from AeoniQ will biodegrade in 10 weeks. Synthetic fibres and fabrics cannot compete on this, unless an additive is incorporated into the polymer to speed up degradation.

With regards to recyclability, Carmen Danner insists that HeiQ AeoniQ can be recycled "eternally", though this "depends on various factors," she says. "But the fibre ultimately needs to biodegrade at the end of its lifecycle." HeiQ and Lenzing can both incorporate pulp recycled from used cotton-rich textiles to make their fibres. They have also both formed partnerships with Renewcell to integrate Circulose pulp into their production processes. Lenzing's Tencel lyocell with Refibra technology is made from a blend of wood and cotton pulp.

Likewise, at HeiQ, pulp derived from used cotton can be used to make AeoniQ. "Our process is very flexible with regards to feedstock, we have

A blend of hydrophobic and hydrophilic fibres, Drirelease offers a wide array of options for different use cases that combine polyester or polyamide with cotton, hemp, lyocell, wool or even, soon, a pineapple fibre.

CREDIT: OPTIMER / DRIRELEASE

Manmade cellulosic fibres are made from wood pulp, a renewable resource, which also makes them biodegradable,

says Lenzing.

CREDIT: LENZING



already started using pre- and post-consumer waste and we are in trial phases with Renewcell, Evrnu and Circ,” says Ms Danner. She adds that AeonIQ is a filament fibre, which means it is more durable and it may generate a higher-quality fibre once recycled, compared to a staple fibre.

On these two topics, Mr Jaju points out that there are different ways to envision sustainability. A synthetic yarn will not biodegrade, unless an additive is incorporated into the fibre, but he says that with regards to durability, synthetics are peerless. “If you take a recognised durability standard, such as the Martindale abrasion test, a synthetic fabric will resist rupture long after a cellulose-based textile. A synthetic garment can be worn longer and that helps reduce its overall impact,” he notes.

Recycled polyester (rPET) may often be favoured over its virgin counterpart, but its uptake is slow; it inched up from 14.7% to 14.8% of global polyester production in 2021. It faces the challenge of switching from an open- to a closed-loop system by replacing PET plastics with used polyester textiles. While both synthetics and cellulosics can theoretically be recycled, mechanically or chemically, in practice the industrial infrastructure to do so is far from reaching a scale that would bring either of them into the mainstream.

There is also a global move, among sports brands and beyond, to favour plant-based



A digital rendering of a top made from HeiQ AeonIQ.

CREDIT: HEIQ

materials derived from renewable resources over those made from fossil fuels. This argument gives manmade cellulosic fibres another advantage.

Ultimately, choosing to favour one or the other category of fibre will depend on the use case of a finished garment, whether it is designed for extreme conditions or as a lifestyle item of clothing. Yet, unpacking their relative properties does seem to open the door for an increased presence of manmade cellulose fibres in activewear. 

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It has unique performance properties and offers unrivalled warmth to weight. The natural material is also robust allowing it to be recycled, if properly cared for. But down is not without shortcomings and specific challenges. Technical innovation has solutions for some of these. A new set of start-ups is betting on plant-based and peatland-restoring alternatives.

A look at what's up in down

Down is considered the best thermal insulation material in the world. Its performance properties are rarely brought into question. But, like any animal-based raw material, it suffers long-standing criticism from animal welfare activists and organisations. This is the talking point that new companies developing a down-like fluff from bulrush or cattail plants put forward. To this, down suppliers can reply that their raw material is a by-product of the food industry (from birds bred for food) that would otherwise go to waste. While the workings of this particular supply chain may often be difficult to spin into a positive marketing message, consumer attitudes are slowly shifting as an anti-plastic movement gains traction and microplastic pollution awareness grows. The landscape is thus changing, amidst unabated popularity for puffer jackets that drives demand for down.

Suppliers of premium and branded down have for the most part taken measures to secure sourcing from farms and slaughterhouses that can certify best practices. But responsible down products are a small portion of the global down market. In Textile Exchange's Preferred Fibre & Materials report for 2022, the Responsible Down Standard (RDS) and Downpass account for, respectively, 3.2% and 1.2% of the 565,103 tonnes produced in 2021. As for recycled down, Textile

Exchange pegs its market share at just under 1%, or some 5,580 tonnes.

Patagonia now claims that 85% of its down-padded products are made from second-life plumes. The North Face has also stepped up its use of recycled down so that this now represents nearly 30% of its offering. Many lifestyle and sports brands, from Moncler to Rab, offer puffers made from recycled polyester or nylon fabrics encapsulating 100% recycled down. Textile Exchange's latest Material Change Index (MCI), a self-assessed survey that 424 brands contributed to in 2021, notes that the volume of 'preferred down' fell from 97% to 93%, but recycled was up as recorded by the 41 companies that filled the index's down module. The volumes reported by the 15 companies having made the switch approaches 2,000 tonnes and increases each year. MCI authors conclude that this sends a clear signal to the industry.

Adding GRS to RDS

Allied Feather & Down, the developer with The North Face, of the RDS, now managed by Textile Exchange, views favourably any progress made in transparency, education and animal welfare. These, says company creative director, Matthew Betcher, lead to better quality overall. The next step forward would be to offer down holding both the RDS and Global Recycling Standard (GRS), the holy grail, as

VF-owned brand The North Face spearheaded the Responsible Down Standard (RDS) and uses it exclusively. Its new Himalayan suit, designed by women for women, is padded with 900 fill power RDS-certified down sewn in baffles designed to minimise cold spots. The North Face athlete Dawa Yangzum Sherpa was part of the product development team.

CREDIT: SAVANNAH CUMMINS / THE NORTH FACE



he sees it. The down specialist, headquartered in California, is launching such a programme with Renu:Trace. "Current recycled down offerings have one major flaw: they don't necessarily comply with RDS protocol, meaning it's impossible to know how ethically the birds in the supply chain were treated. Renu:Trace will fix that," says Allied president, Daniel Uretsky. Achieving volumes of this type of down will take time, concedes Mr Betcher. "We are at the infancy stage of achieving a product offering that is both recycled and RDS certified."

Allied launched its first RDS-certified down in 2015 along with a consumer-facing online traceability tool known as Track My Down. This platform will soon be expanded to include information on a product's environmental impacts and steps that can be taken to offset them through a partnership with Protect Our Winters (POW). "Education is essential for consumers, and the new version of Track My Down fills out gaps in the information a brand can provide," says Mr Betcher, adding that the platform has proven to be quite popular, with some 23,000 daily users. In time, information drawn from an LCA will enable the platform to indicate emissions, he says, as part of the company's science-based targets.

“Our ExpeDry down makes hydrophobic down obsolete.”

MATTHEW BETCHER, ALLIED FEATHER + DOWN

Improving on down

A new high-tech reference at Allied Feather & Down is a gold-infused finish, supplied by Fuze, a US-based biomed company. This ExpeDry down was initially developed to offer antimicrobial properties, but was also found to speed up drying by 50%. "We discovered that the gold particles create an electrostatic barrier that weakens the hydrogen bond of water. It makes water evaporate faster and prevents moisture from turning into water droplets," says Mr Betcher. This, he believes, "makes hydrophobic down obsolete." It is, furthermore, a more sustainable solution he says, as "down will be easier to care for and will therefore last longer".

To address some of the natural material's shortcomings and specifically improve its performance in humid conditions, Cincinnati-based Downlite offers down treated to combat bacteria, with pur-down, and a PFC-free water-repellent treatment, activ-dri.

Innovation in down extraction

Technical innovation is also being applied to circularity, with the development of machines that can remove down from used apparel. The primary source of recycled plumes has been bedding. While extracting the plumes from duvets and pillows is fairly easy – a slash in the cover fabric releases its contents – more handling, or specialised machinery, is needed to draw out down enclosed in sewn or welded baffles. This process is being automated and such machines are now in operation at Re:Down, in China, and at Debrand, in the US, in a partnership with Downlite.

French-Asian company Re:Down sells only recycled down and created a down-extracting device with Iteratif, a circular solutions provider based in Chamonix, France. It has been installed in





US-based Downlite is looking into possible reuse cases for down fibre and dust waste from its washing and drying processes that could be used to make batting.

CREDIT: DOWNLITE

Re:Down's China-based supply chain near Shanghai. "A vast majority of the recycled down we sell was being sent to China and Vietnam but shipping it from Europe to Asia is not very sustainable," Eric Firmann, CEO and co-founder tells WSA. The company has two main sources of used down: bedding in Europe and clothing in China. The more complex process of extracting the natural filler from used garments is done in China where labour costs are lower, he says.

Downlite's Recharged recycled down also comes in part from clothing utilising a machine developed by Debrand. The Vancouver-based reverse logistics company retrieves pre- and post-consumer products, including seconds, from brands and retailers. The device automatically removes unwanted materials, pieces of fabric, labels, zippers and sewing threads, and also separates white from grey, says Josh Werthaiser, Downlite's president and chief finance officer.

As part of a strategy to become a zero-waste company, Downlite is currently testing a new outlet for unused material from its own manufacturing processes. "Washing and drying generate some down fibre and dust," says Mr Werthaiser. This is "usable" waste, and research is under way to combine it with another filling material to create insulating batting for apparel. It has already been tested by brands, and has been found to offer high thermal insulation and washability, he says.

Recycled down is part of Minardi Piume's offering, but the Ravenna-based company has also developed what it says is a "200% natural" filler it calls FlowerDown, which it makes from a blend of down and kapok. "These two materials work well together as kapok is naturally hydrophobic and antibacterial," says Filippo Zaniboni, sales manager. The company has patented this process, as he says combining the two is tricky due to the tendency of kapok fibres to clump. "Our method mechanically spreads the kapok within the down, using neither chemicals nor additional energy," he says. The

percentage of kapok is usually around 20% to 30%, a proportion that he says works well for jackets, but it can go up to 50%. Adding kapok has the advantage of aligning the price of FlowerDown with that of a premium synthetic filler.

Vegetal down

As providers of a high-performance raw material that is recyclable, biodegradable and even compostable, suppliers of down suggest it is one of the most sustainable textiles used in apparel. But a few enterprising young companies are developing plant-based alternatives derived from plants widely known by the names bulrush and cattail. These companies believe they have a better solution that can also help restore wetlands



Recycled down specialist Re:Down has developed a machine to extract down from clothing with its partner Iteratif.

CREDIT: RE:DOWN

and can be considered carbon-negative.

"Wetlands and peatlands are biodiverse, carbon-rich ecosystems that support 40% of all species on earth, including humans," points out Julian Ellis-Brown, chief executive and co-founder of one of these companies, UK-based SaltyCo. "This critical ecosystem is shrinking, we have lost 89% of it in the past 300 years." He explains that SaltyCo's plan is to develop regenerative agriculture solutions to restore wetlands to their original state and create a new resources for apparel manufacturing at the same time.

He points out that one particular challenge the company faces is in convincing the owners of these wetlands to plant crops that have regenerative properties. Not all wetlands have the same needs, and a certain amount of flexibility is required, he says. The company estimates that there are 25 million hectares of farmed peatland worldwide and it is now working with farmers and Natural England, a government environmental body, to support peatland restoration.

The founders of Fluff Stuff share a similar goal. They want to reintroduce the cultivation of cattail plants in distressed peat moss areas in Finland and harvest the fibre to make a thermal insulation filler. Aalto University students Lukas Schuck and Tea Auramo are the company's co-founders and postulate that reintroducing cattail farming could help Finland reduce its carbon emissions; a prototype machine to automate harvesting has been developed.

SaltyCo has created a Planet Positive Textiles platform to market its bulrush fluff-based filler BioPuff. "We are in the early stages of scaling up. We are now processing tens of kilos per day, and we expect to produce hundreds of kilos per day later this year," says Mr Ellis-Brown. Next year, the company believes it will be able to deliver bulk orders, and it is in talks with lifestyle and activewear brands for a market launch this autumn. The company still faces a number of challenges. The first is that cattail fluff on its own does not make a good fibre fill. The team is looking for ways to improve its performance and properties by making it stronger with a biobased coating or blending it with another plant-based fibre. One technical issue that has been resolved is making BioPuff machine-washable. "It is the first question I get asked, systematically, and it is one of the main challenges of cellulose-based materials that tend to clump," says Mr Ellis-Brown.

Fluff Stuff co-founder Tea Auramo tells WSA that the material the Finnish company is using, Typha fluff, has "excellent thermal properties, dries faster and has a comparable recovery from compression with down's. Additionally, its breathability is better than that of down. The fibre performs well in washing tests, where it is again very similar to down." The start-up says it is currently finalising product development and is in talks with a handful of brands.

For those that endorse the move to go plastic-free, down, kapok and cattail all fit the bill. "In addition to its longevity compared to synthetic



fillers, on its own, down can be composted and biodegrades within days in the right conditions. It won't release any microplastics either," says Josh Werthaiser at Downlite.

Matthew Betcher, at Allied Feather & Down, has noted a shift in consumer attitudes through the company's social media monitoring. "In the past, any reference to down would generate a lot of criticism, but with rising of awareness of microplastic pollution, the proportion of positive comments has risen. Now only 65% of comments suggest that synthetics are better than down. Public sentiment is changing. There is now more talk of a product's end of life," he says.

Down, arguably, has a cleaner end of life than its entry into the apparel supply chain and its performance and sustainability credentials are widely recognised. Some may prefer a plant-based alternative, but they may also find that the development of a material capable of emulating down does not come easily. 

The recycled gold particle finish of Allied Feather + Down's ExpeDRY is said to increase the material's resistance to humidity and speed up drying. It is featured in the collections of US-brand Artilect.

CREDIT: ARTILECT

British start-up SaltyCo plans to market a natural filler made from bulrush fluff. BioPuff would be the first commercial product within its Planet Positive Textiles platform.

CREDIT: SALTICO





RISE TO THE CHALLENGE

An investment in equity in Genomatica in 2021 was Lululemon's first in a sustainable materials company. The gymwear brand has now followed up by launching T-shirts made from nylon, developed from Genomatica's plant-based building blocks.

Lululemon has reached its target of launching alternative nylon solutions ahead of schedule.
CREDIT: LULULEMON

Plant-based nylon garments

What began as an interest, then an investment in plant-based nylon at yogawear brand Lululemon has now resulted in garments. The Canadian company announced in April that its first plant-based nylon garments are now on the market.

The garments, plant-based versions of its short-sleeved T-shirt styles called Metal Vent and Swiftly Tech, were almost two years in development, Lululemon states, but the plant-based nylon they are made from has a much longer development history. It is the work of Genomatica, or Geno, which chief executive and co-founder, Dr Christophe Schilling, launched in the 1990s while carrying out research into sustainable materials for his PhD at the University of California, San Diego. His co-founder was the university's professor of bioengineering, Bernhard Palsson.

Their work produced a proprietary technology that converts renewable carbon in the form of sugar from plants into butanediol (BDO), the key chemical intermediate for making caprolactam and hexamethylene diamine (HMDA), precursors for nylon 6 and nylon 6,6 respectively. The aim from the beginning was to use these building blocks to produce 100% renewable carbon-based nylon 6. Geno took a look at the traditional, fossil fuel-based nylon industry, which has a value of more than \$20 billion per year, and decided to disrupt it.

Story so far

In 2013, Genomatica won a prestigious chemical engineering prize, the Kirkpatrick Award, for its process to produce biobased butanediol. In 2017, Geno developed another new process, this time to make butylene glycol for the beauty industry (giving its new brand of 1,3-butylene glycol the name Brontide) and, in 2020, Brontide won an award, too, the Green Chemistry Challenge, organised by the US Environmental



Protection Agency. Partnerships followed for scaling up both these processes, with major groups, including Novamont in 2016, Aquafil in 2018, Covestro in 2019 and Asahi Kasei in 2022, signing up to work with Geno.

At the time of Covestro's announcement about partnering with Geno, its chief technology officer, Dr Klaus Schäfer, said: "Being able to derive key materials from biomass is essential for making our industry less dependent on fossil raw materials and market fluctuations. We are pursuing our vision of making the world a brighter place." When, in 2022, Geno and Aquafil began what they call pre-commercial production of plant-based caprolactam at a new demonstration plant located at a site in Slovenia, Aquafil chief executive, Giulio Bonazzi, said: "The world needs to put into action every possible approach to make supply chains sustainable. Making biobased nylon is an essential piece of that."

The project with Asahi Kasei involves Geno's plant-based butanediol to make HMDA for its nylon 6.6 offering. The Japanese group said it viewed Geno as "an essential partner" in its drive towards carbon neutrality. Its nylon 6.6 yarns will still be 50% derived from fossil fuels because its construction is from HMDA and adipic acid, which is still made from fossil-derived feedstocks. But the HMDA half of the recipe can now be plant-based, utilising Genomatica's breakthrough.

Qore, established in 2021 as a joint venture between chemicals firm Helm and food corporation Cargill's bioindustrial business, has launched its own brand of biobased butanediol, calling it Qira. It has licensed Genomatica's BDO process technology to make the product and has said it will open a dedicated Qira production facility at Cargill's biotechnology campus in Eddyville, Iowa, in 2024. Qore's immediate ambition is to bring to market a minimum of 65,000 tonnes of biobased BDO per year.

Luring Lulu

Lululemon kept a close eye on all of this and very much liked what it saw, so much so that it decided in 2021 to open its chequebook and its order book to Geno.

The Vancouver-based brand has said nylon makes up the biggest portion of the materials it uses. "Nylon provides outstanding product performance and quality that cannot currently be replicated with other materials," Lululemon claims. "Our goal is to transition from virgin nylon fibre to renewable or recycled fibres to reduce our dependence on fossil fuels and lessen carbon emissions, while simultaneously ensuring uncompromising feel and performance." It has committed to using nylon made 100% from renewable or recycled content by 2030 and says: "This is by far our most challenging materials goal."

It was to help it meet this challenge that Lululemon took part in a C Series funding round for Genomatica in 2021, which brought in total investment, from all participants, of \$118 million. C Series is about scaling up innovations that have



already been proven to work and that is what Geno pledged to do with the 2021 cash injection. This was the first time Lululemon had invested in the equity of a sustainable materials company. Its vice-president for raw materials, Patty Stapp, said: "By transitioning our nylon to renewable content, we will impact over half of the synthetic materials we use in our supply chain. We have seen Genomatica repeatedly and successfully deliver industry-changing biobased materials on a commercial scale and are confident this partnership can truly change the way we source products."

Bobbins of plant-based nylon yarn at Aquafil's facility in Slovenia.

CREDIT: AQUAFIL

Advances in biomanufacturing

On the path towards its 2030 target, the gymwear brand had committed to launch "alternative nylon solutions" by 2025. By introducing the plant-based versions of its Metal Vent and Swiftly Tech T-shirts, it has achieved this target early. At the time of the launch, Geno chief executive, Dr Christophe Schilling, said it marked a major achievement. He said the partners were opening a new chapter for plant-based nylon and "accelerating the sustainable materials transition".

He believes that an array of openings awaits plant-based nylon. Dr Schilling appeared before a US Senate Committee on Agriculture, Nutrition, and Forestry to contribute to a discussion about advancing biomanufacturing in the US. To give them a sense of Geno's potential impact, he said that replacing current petroleum-derived ingredients with plant-based alternatives could reduce carbon equivalent to taking more than 18 million cars off the road each year because "bio-nylon has notably lower greenhouse gas emissions than conventional alternatives". He said procurement professionals should engage much more deeply with the manufacturers of upstream ingredients, including Geno, rather than only with the manufacturers of finished products. This would help them make informed decisions about stipulations for biobased content in the products they source. "We are ready to get to work," he told the politicians and policy-makers. "The US has the raw materials, the technology and the talent to be the world leader in biomanufacturing. The time to invest in building this important industry is now." 



NEWCOMERS

The pace to meet the under-served activewear needs of more women is picking up as industry leaders begin to zoom out and piece together the bigger picture.

Another angle

Outdoor brand Berghaus' launch in mid-April of a wrap-style performance headscarf "to help remove barriers that discourage Muslim women from walking and climbing" was noteworthy for a couple of reasons. First, a hijab expressly targeted at outdoor pursuits rather than the gym, swimming or team sports, all territories that Nike, adidas, Under Armour, Lululemon, Hummel and Haute Hijab have, to varying degrees, ventured into previously, felt new. Second, the idea that the concept was first put to the company, headquartered in north-east England, by brand ambassador Zahrah Mahmood of @the_hillwalking_hijabi fame on Instagram was also significant, particularly as Ms Mahmood then went on to help Berghaus develop and refine the garment over a period of three years.

Speaking at the time of the launch, the Glasgow-based accountant, who was appointed honorary president of walking charity Ramblers Scotland back in March, pulled no punches in remarking that the scarf's more traditional, face-framing design importantly offers practising women an alternative to the "egg head" look, her term for pull-on exercise hijabs. "The material will just stick to you and not feel good," she says of those versions.

Points of view

To navigate this, the Berghaus team, led by senior designer Kate Ablett, landed on US functional textiles developer Polartec's Delta fabric, introduced in 2016 as its first-ever cooling solution. Delta's highly breathable and moisture-wicking baselayer properties made it "ideal for a technical activewear hijab", as Ms Ablett puts it to WSA. A combination of alternating hydrophilic and hydrophobic yarns, the knitted fabric is constructed in a radiating matrix to produce an evaporative cooling effect, inspired by the body's own natural cooling processes. Its next-to-skin hydrophilic fibres (typically lyocell, in Delta's case, but sometimes other cellulose) pick up and retain "little bits" of perspiration, working to regulate drying by drawing out the evaporative



(Left:) Zahrah Mahmood's insights provided Berghaus with a window into the world of women who ask something different of their outdoor gear.

CREDIT: R29/SANDRA SEATON

(Right:) Salomon's Service-to-Athletes design team played a major part in making Courtney Dauwalter and her fans' Shortney dreams a reality.

CREDIT: @THE.ADVENTURE.BAKERY

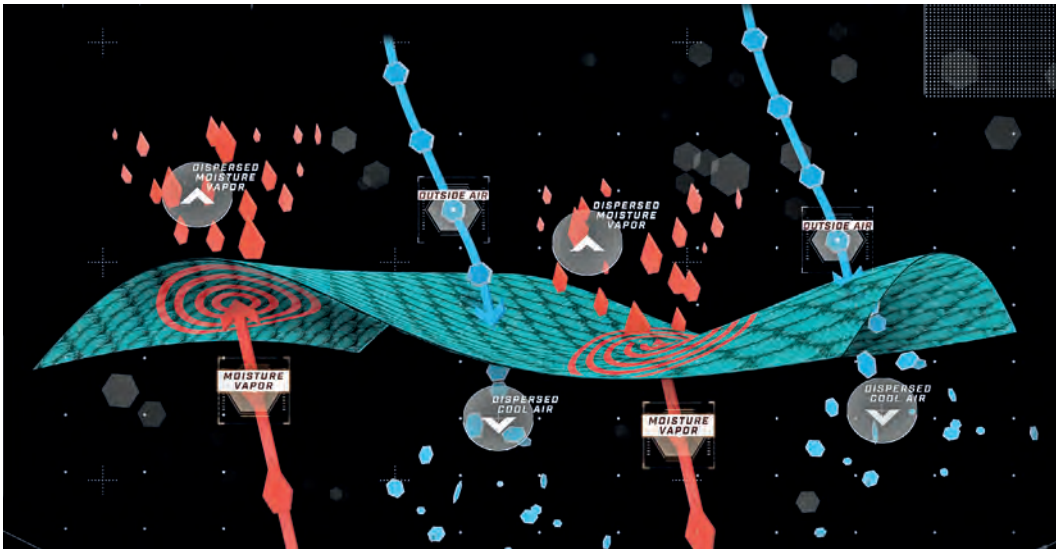
cooling phase in comparison to faster-drying synthetic materials. Meanwhile, knitted zones of hydrophobic fibres, mainly post-consumer polyester from recycled PET bottles, though virgin polyester is still used on occasion, stay open and breathable, as Polartec's global director of product marketing, Karen Beattie, tells us.

All this means Delta "occupies a Goldilocks zone of comfort", Ms Beattie explains, with a hand feel not unlike cotton, yet not as slow to dry, and resistant to wetting out and unwanted skin-cling. Available in numerous weights and knit textures, Polartec Delta ranges from gossamer light and high-activity fabrications to "more substantial" versions better suited to collars, plackets and even ultraviolet protection, she adds. The lightweight variety selected by Berghaus can therefore be draped, folded and fastened to suit, without the need for multiple layers of fabric. After several rounds of testing and prototyping, the hijab is built on a cap-like base, secured by a concealed

“Comfort is key, and I know there will be many people who are thrilled to have a lightweight, long-inseam option to run in,”

COURTNEY DAUWALTER





The cooling effect produced by Polartec's Delta textile technology hinges on an optimum balance between cellulosic and polyester yarns, knitted in radiating zones.

CREDIT: POLARTEC

headband and fastened with a knot. Carefully placed press studs replace the unreliable, and at times uncomfortable, pins often used to fix similar scarves. The co-creators' aim was to offer a modesty-friendly product that would help make women feel "confident, secure and ready for anything while outdoors", according to Ms Mahmood, who Ms Ablett says was happy with the final outcome. Released only in black initially, it is currently being sold for just over \$30 (£25).

"It's weird, it's uncommercial"

Along similar lines, another outdoor brand, Salomon, brought its 26.5-centimetre-inseam women's Shortney shorts to market this May. In a LinkedIn post, the company's global vice-president of apparel, Ben Ryan, described them as an "exact replica" of the pair Salomon's Annecy design centre in the French Alps custom-makes for trail running athlete Courtney Dauwalter each season. Minnesota-born Ms Dauwalter is a two-time Ultra-Trail du Mont-Blanc champion and a Hardrock Hundred Mile Endurance Run winner, among a long list of athletic achievements. She is well-known among ultrarunning communities for favouring uncommonly loose-fitting gear, including oversized tees and knee-length, basketball-style shorts, nicknamed "Shortneys" by fans. Ms Dauwalter has said she "never imagined" she would start a trend, let alone one that would ever catch on, but acknowledges that she had "always preferred long shorts" since her early years, as they helped her feel more comfortable during training. "Comfort is key, and I know there will be many people who are thrilled to have a lightweight, long-inseam option to run in," she told Salomon.

From the brand side, more typical feedback might be "it's weird, it's uncommercial, there is no research to back it up and not enough people will want to buy it", Mr Ryan went on to say. In this way, the Shortneys' launch effectively turns conventional business wisdom on its head, he proposes, and are thus, in his view, tangible evidence of his team's bravery, risk-taking and embrace of "the inspiration that our athletes bring us". Made from a four-way stretch polyamide-elastane blend, using the

company's own targeted moisture-wicking and quick-drying AdvancedSkin ActiveDry textile technology, the regular-fit shorts also incorporate five-times-faster-drying 37.5 Technology for temperature regulation, reflective inserts and a semi-elasticated waist. They likewise bear a personally meaningful quote from the athlete, printed in tiny reflective typeface, just behind the right knee: "No one else can run those miles for you". Priced at \$90 (£80), they are already sold out online in either black-and-white or grape leaf green.

Making an impression

April further saw the launch of Unilever-owned bath and body brand Lux's Change the Angle initiative in South Africa, to coincide with its sponsorship of the two-day Durban Open Women's Beach Volleyball tournament midway through that month. Spearheaded by communications agency Wunderman Thompson's Singaporean office, the campaign homes in on what it frames as media-led visual representations of sportswomen's bodies for viewers' consumption. "All too often, media cameras covering female athletes have zoomed in with impunity to their breasts, buttocks, thighs and crotches," Wunderman's global business lead, Hinoti Joshi, tells WSA. She adds that women are up to "ten times more likely than men to be objectified in sports", citing research conducted by Californian "gender justice" organisation The Representation Project (TRP) in the wake of the 2020 Summer Olympics in Tokyo, held between July and August of 2021 owing to covid-related delays. TRP's report, titled #RespectHerGame, says it found that 5.7% of female athletes were objectified visually (that is, "when a camera pans an athlete's body or focuses on specific body parts in a sexualising way"), in contrast to 0.6% of their male counterparts.

Change the Angle thus set out to challenge "sexist" angles head-on, through deliberate placement of printed QR codes on the back of female volleyball players' shorts. Scannable by a camera's lens, viewers of certain shots are immediately directed to a short film in which athletes relay uncomfortable claims such as "2,500 images objectifying women [were]

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reported” during Tokyo 2020 and other statistics relating to Athens 2004. The video, viewable on YouTube and other platforms, ends with six “best-practice tips” for camera operators: don’t focus on intimate body parts; frame their game, not their body; don’t create sexualised imagery; aim for athletes’ skills, not disrespectful close-ups; avoid indiscreet camera angles; and capture beauty in strength and prowess. State-owned South African Broadcasting Corporation (SABC), which counts six television channels and 19 radio stations, was a key partner and, according to Ms Joshi, over 80% of media who attended the Durban Open have since shared that they would be open to adopting its core guidelines in the future. The campaign has already achieved 4.7 billion impressions and it has featured in 375-plus publications across the globe, generating \$500,000 in earned media so far, she shares.

It is striking that it took Lux, a beauty brand, to cause this kind of ripple effect. The issue was raised, to some extent, at an International Textile and Apparel Association conference in Cleveland in 2018, during which two researchers from Indiana University discussed the “objectification of women in sportswear brands’ Instagram accounts”, drawing on their analysis of 1,000 promotional images or 200 each from the primary accounts of the then highest-ranking sports brands in the US: Nike, adidas, Dick’s Sporting Goods, Under Armour and Puma. The team found 167 “objectifying” images of women in total, representing 33.4% of all single-person ads examined, with Nike coming off worst (39% of its Instagram visuals were considered to be “objectifying”) and Dick’s Sporting Goods faring best, at 23%. This led them to conclude that, if influenced to self-objectify as a result of their media consumption, women and girls could be persuaded to abstain from sports participation, thereby hindering their athletic development.

Imaginative leap

Roughly one year prior, UK golfing e-tailer GolfSupport carried out its own survey of 1,700 women. Participants were asked how they really felt about athletic leisurewear and their motivations for wearing it. Strikingly, 76% of those asked reported that they “felt female activewear can be sexist at times” and 18% said they had felt objectified while wearing it. Of course, the data is not new and opinions, as ever, varied, but a couple of respondents’ comments do give cause for pause. One woman’s answer, shared on the retailer’s website, was that she believed “current trends are sexualising sportswear for women, such as sheer fabrics and panels”, which she suggested was “unnecessary and completely unrelated to what [activewear] is designed for – exercise!” Another described how tight fits, low necklines and what she felt was too much exposure around her hips, waist and chest made her feel like she “can’t run” in some sports clothing.

Fast-forward to the current year and TikTok videos tagged #GymWeirdo have been viewed in



excess of 2.6 billion times as of mid-May. That number does not include #GymCreep (285.1 million views) and other spin-offs. The undertones to these videos are often voyeuristic. Men and women alike have inevitably pushed back on this social media ‘trend’ and the jury is still out. What is clear, however, is that gyms, despite their relative uniformity, are not neutral territory. How exactly sports attire plays into this debate differs from culture to culture, person to person, depending on whom you ask, and the answer is not a simple one; there are as many nuances as there are human beings.

Obviously, more form-fitting or lower-coverage fitness apparel does not automatically inspire “weirdo” or “creep” behaviour in others. Nor is there any suggestion here that extra layers, higher cuts or looser fits might dissuade an individual who is so inclined. But with all the investment in sportswear design, development and storytelling, there is surely room for improvement, to offer smarter solutions to more people.

Opportunities abound

By next year, the worldwide activewear market is projected to be worth approximately \$575 billion, according to Allied Market Research. It is somewhat surprising, then, that concepts like knee-length, loose-fit technical running shorts for women and hijabs suitable for outdoor sporting activities still seem so novel and, in the case of Salomon and Berghaus, apparently ambassador-inspired. The most hyper-visible global brands have possibly developed blind spots from the sheer scale of their operations, perhaps becoming too reliant on centralised, one-size-fits-all product strategies. Or maybe some have simply become a little too laser-focused on honing top-performing products from past seasons to fully appreciate the opportunity, especially after several years of uncertainty. Either way, while women from all walks of life are still working out in generic baggy t-shirts and bottoms, dressed in all manner of less-than-technical layers to be active while remaining comfortable, why not dig a little deeper? Nothing ventured, nothing gained. 🌍

Lux’s Change the Angle campaign is not backwards in coming forwards in how it confronts unwanted camera close-ups of female athletes’ bodies.

CREDIT: LUX



FOOTWEAR TECHNOLOGY

Garmont taps into 'unexplored market segment' as the use of e-bikes and 'slow tourism' change consumer needs.

Relaxed explorers need multitasking shoe

Outdoor footwear brand Garmont believes it has invented a new category of shoe, or at least one that meets the needs of "a currently unexplored segment of the market". The 9.81 Hi Ride, which Garmont describes as "a hybrid shoe developed for those who love to cycle along rolling dirt trails, but not without getting out of the saddle for short walks in the woods or around a picturesque old town" is, therefore, an all-in-one shoe for hiking and biking.

The Italian company, which was established in 1964 and produced 500,000 pairs of shoes and boots in 2022, studied how consumers' activities were changing and how needs were altering as a result. The pandemic and associated lock-downs slowed the pace of life for many, and created a new-found love of the outdoors as people craved a healthier lifestyle.

"The events of recent seasons have rekindled interest in the environment and the desire to be in contact with nature and, among the technological innovations that have led to an increasingly active life, e-bikes have certainly contributed to widening the audience of users, also creating a new consumer profile," Davide Calcagnotto, general manager of Garmont, tells WSA. "This new end-consumer reaches destinations never reached before and enjoys slow tourism as a form of entertainment, discovering the territory, from gastronomy to culture, without chasing performance."

The move away from performance presented a challenge: to design a shoe with sufficient rigidity to apply force to the pedal and, at the same time, the required flexibility to be comfortable enough to walk in. Garmont overcame this challenge with a two-zone outsole it calls the Garmont Traction Formula (GTF) Hyve. One part of the sole is made



From bike to path to restaurant; new type of consumer operates at a slower pace. ALL CREDITS: GARMONT

from recycled rubber with large, deep lugs to achieve the right compromise between grip, traction and durability while walking. The other zone is made from a softer compound with high-density honeycomb lugs to offer increased pedal grip.

Gone are the classic cycling bindings for performance shoes; instead a proprietary heel-lock technology keeps the heel in place when the laces are tightened. This works by means of loops that are integrated into the lateral reinforcement.

"There are already shoes on the market that are ideal for trail riding and e-bikes, but which focus on power transmission during pedalling and are not very oriented towards walking," explains Mr Calcagnotto. "Garmont wanted to take the alternative route, allowing comfortable hiking without sacrificing the right compromise of stiffness for pedalling."

Selective suppliers

Sustainability of materials is a "fundamental pillar" of Garmont, and the R&D department pays particular attention to the use of materials that provide excellent performance but with the lowest possible environmental impact, he adds. The upper is made from recycled, abrasion-resistant rip-stop nylon, while the lightweight protective panels and the heat-bonded TPU trim provide added protection. The shoe also has an Ortholite insole made from 98% recycled materials, and a midsole made from a bio-based compound derived from sugarcane.

"Our suppliers are chosen with care, because we select only high-quality raw materials, favouring the reduction of emissions and a supply chain that is as short as possible," says Mr Calcagnotto. "This is because transport also affects sustainability, and the high quality of the materials guarantee greater durability once the shoe is assembled. A shoe that lasts longer will clearly have less impact."

The concept and R&D work began in 2021, and although this was not an easy time to invest in new products, given the uncertainty in the market due to the pandemic, the Veneto-based company pushed ahead with the testing. "Right from the start, we set ourselves the goal of responding to the needs of a new niche market and we did it our way, with the classic Garmont style, that is developing a shoe with our trusted testers who carried out tests for several months. They were the first to be surprised by the versatility of the shoe, by its comfort and flexibility when walking."

Risk management

Although the pandemic disrupted some supply chains, Garmont is now growing strongly. It reported revenues of €40.5 million for 2022, an increase of 60% compared with the previous year. The company said this was a testament to its ability to respond to market opportunities as they arise, despite increasing production costs and supply chain shortages.



Mr Calcagnotto explained that the company adopted a risk management and product/market/footprint diversification strategy in 2019. It now sells in more than 50 countries and manufactures in Europe, Asia and America, which allows it to respond to opportunities quickly, with a "lean and efficient" internal structure. "We share our feedback with customers and involve them in planning," he adds. "We adopted innovative tools such as Maker Sights, which allow us to work with three-year plans but enables us to introduce corrective measures quickly, if necessary."

These 'corrective measures' might include changing a colourway, for example, as marketing tool MakerSights enables brands to gather consumer sentiment and feedback via interactive charts within the platform, helping them decide which products or colours might sell well, or not, before rolling out a concept more widely.

Germany remains Garmont's top market; it has a wide distribution network there and generated a 60% increase in sales in 2022. It achieved good results in the rest of Europe and said demand for its products was also strong in the US, growing by 40% compared with 2021. Over the next three years, Garmont plans to lower the CO₂ impact of its best sellers, increase digitalisation and open up new markets.

Impressing judges

For the 9.81 Hi-Ride, this summer will be a pivotal time with several consumer-focused events planned, following pleasing interest and good sales results in its first season. The design was a hit at bike industry event Design & Innovation Awards, where a panel of journalists, professional test riders and industry experts named the shoe the winner in the Outdoor category.

"The 'phase-in' period is not easy to plan, especially if there is no history," says Mr Calcagnotto of the shoe's introduction, "but we are convinced that through product test opportunities, the 9.81 Hi-Ride will find more and more space." 

Reflective accents have been added to the heel for greater visibility.

Power struggle

Many ambitious decarbonisation and sustainability targets have been set in recent years: the European Union aims for a 55% reduction in greenhouse gases from 1990 levels by 2030 and to be climate neutral by 2050, the US is aiming for 100% clean energy by 2035, and the UK aims for net-zero emissions by 2050, to name but a few. Multiple groups and companies have also signed up to net-zero targets, some as soon as 2030. However, without a sea change in how we operate, these targets could be difficult to meet. It will take a gargantuan effort – propped up by billions of pounds of investment and globally joined-up legislation – to prise the world from the grip of fossil fuels. But these billions are starting to appear, and policy is being implemented, as companies scramble to capitalise on any first-mover advantage.

Hydrogen, which accounts for around 2% of power, is considered “critical” to this effort. It is not only the most common element in the known universe but also one of the most energy-dense molecules. Put simply, water can be split into hydrogen and oxygen by means of an electric current, and if the electrolyser is powered with solar, wind or wave, then the ‘green’ hydrogen it produces provides an emissions-free source of power. The main users of hydrogen – steel, fertilisers and some chemicals makers – produce about 9% of global emissions, which could be slashed if they converted to green hydrogen from the current grey hydrogen (made using natural gas), according to the International Energy Agency (IEA).

Hydrogen does not just present the potential for cleaner energy, countries are also keen to become



SUSTAINABILITY

A German partnership is exploring how green hydrogen could be used by textiles machinery, as companies test and scale the energy source that has been touted as one route towards decarbonisation.

more self-sufficient, not least in the wake of Russia’s invasion of Ukraine and the disruptions in gas supply that have sent energy prices skyrocketing, affecting business and domestic users alike. Euratex, the European textiles industry body, complained in November to the European Commission about a lack of support in the face of steep increases in energy prices. At that time, the energy cost in Europe was more than six times that of the US, China and neighbouring countries. This factor alone almost erased the business case for producing clothing and textiles in the EU, it said, particularly when overseas governments were capping energy prices and providing large subsidies.

Governments know that until the means and infrastructure catch up, taxpayers’ money must prop up the research. And it is not just green hydrogen that is vying for these subsidies: powerful voices from the coal and gas industry suggest the more practical answer to carbon reduction lies in blue hydrogen – where the hydrogen is derived from gas but where the CO₂ is captured, or stored underground. Is there a way to compete meaningfully against the giants?

Iberdrola’s €150 million Puertollano plant in Spain consists of a 100 MW solar plant, a lithium-ion battery system and one of the largest electrolytic hydrogen production systems in the world (20 MW).

CREDIT: IBERDROLA



Joined-up thinking

The theory of green hydrogen is promising, but there are fairly major limitations. The first, and most significant, is cost. It is more expensive to produce electricity using wind, solar or wave than it is from fossil fuels, and producing hydrogen is energy-intensive and therefore expensive in itself. There will be significant costs in the initial set-up – building the production plants, for instance – as well as the infrastructure needed to store hydrogen and transport it. This means green hydrogen currently costs around \$3-\$5 per kilo, when it needs to be in the \$1-\$2 range to be competitive, according to Bloomberg. It is also a difficult gas to deal with – it is highly flammable, creating safety issues, and it is hard to store without leakage. Renewable energy supply needs to dramatically increase, and electrolyzers need to be cheaper and more abundant.

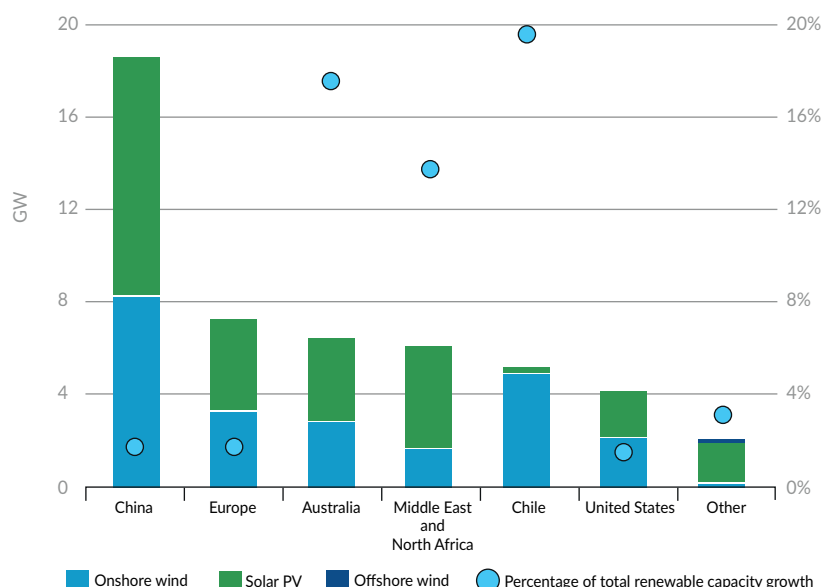
The large-scale overhaul of current systems that is needed means companies are collaborating on solutions and creating joint ventures to speed up the research. Germany introduced its National Hydrogen Strategy in 2020, integrating climate, energy, industry and innovation policies. The country has a well-developed gas pipe network, which some suggest could be converted to transport hydrogen if needed.

The German government last year earmarked more than €8 billion for 62 initiatives to explore options and collaborate on research. Among these projects is WasserSTOFF, a project chaired by machinery maker Monforts that aims to establish to what extent hydrogen could be used as an alternative heating source for textile finishing processes. This will first involve tests on laboratory equipment with partners Pleva and NTB Nova Textil, with academic input from the Hochschule Niederrhein and the Technical University of Freiberg.

“Everybody knows that textile finishing is a high energy consuming process,” says Monforts managing director Gunnar Meyer. “To make this process more efficient, Monforts already offers several solutions, but as a technology leader we are also rising to the challenge of exploring alternative heating options to be ready for the future.”

Following lab tests, the trials will be transferred to a stenter frame at the Monforts Advanced Technology Center in Mönchengladbach. The company will carry out intensive tests to assess the reliability of the processes and final products when different natural gas and hydrogen mixtures – up to 100% green hydrogen – are employed.

But how practical would it be to change how machinery is powered, and what would this mean for manufacturers? “Despite all its advantages, there are obstacles to overcome on the way to widespread, economically-feasible green hydrogen use,” explains Monforts textile technologies engineer Jonas Beisel. “Hydrogen also has a tendency to make steel brittle and subject to fracture, which is something that requires further investigation in both its transportation and use in industrial processing.”



Rapid advancement

Despite the limitations and unknown quantities, the sector is rapidly evolving. Steel makers have built green-hydrogen-powered facilities, while Spanish energy group Iberdrola is running 60 projects in eight countries and expects to produce 350,000 tonnes of green hydrogen per year by 2030. Twenty-five countries, plus the European Commission, have announced plans that include hydrogen as a source of clean energy, and several have begun to introduce financial support schemes. The UK expects to produce up to 10GW of green hydrogen (around 4% of needs) by 2030 and the EC aims to produce 10 million tonnes and to import 10 million tonnes by 2030.

China is leading the expansion of renewable capacity dedicated to hydrogen production, followed by Australia, Chile and the US. While these developments are “laudable” they are still below what is needed to get on track with the Net Zero Emissions by 2050 Scenario, according to the IEA. Faster action is required on creating demand and unlocking investment that can accelerate production scale-up and deployment of infrastructure.

“Hydrogen is the missing piece in the green energy puzzle,” says the Hydrogen Council, calling on partners to “awaken the biggest economic opportunity of our lifetime, create countless skilled jobs and help answer the call to provide cleaner air for all”. If green hydrogen’s production costs fall by 50% by 2030, as it predicts, it could indeed find a way to take a share of the market from fossil fuels, and make a big dint in emissions from transport, industry – and perhaps textiles making. “Green energy’s potential as a clean fuel source is tremendous, but there is much we need to explore when considering its use in the textile finishing processes carried out globally on our Montex stenter dryers and other machines,” concludes Mr Beisel.

Monforts is organising two seminars on the potential of green hydrogen at the ITMA trade show in Milan, June 9-12 June at 11am.

Total renewable capacity dedicated to hydrogen production by region, 2021-2027.

CREDIT: IEA

Sustainable nylon 66 breakthrough

Fibre and textile developer Toray has announced what it is calling the world's first 100% bio-based adipic acid, which, if it turns out to be scalable and usable in commercial contexts, could represent a major breakthrough in making nylon 66 more sustainable. Adipic acid is a key raw material for nylon 66; Toray's new way of producing it uses sugar derived from inedible biomass and the company says it has achieved this breakthrough with a proprietary synthesis technique, combining the microbial fermentation and chemical purification technologies that it already had in place.

Six and six

It is the polymerisation of adipic acid, an organic acid consisting of six carbon atoms, and of hexamethylenediamine, which also has six carbon atoms, that results in nylon 66. It is an important product for the textiles industry because most of the adipic acid that is produced at the moment goes into making nylon. According to Toray, the global nylon 66 market has a volume of 2.5 million tonnes per year and a value of as much as \$20 billion.

Japanese group Toray has announced what it claims to be a potential breakthrough in making nylon 66 more sustainable.

It now intends to subject the nylon 66 it has produced using this new technique to detailed testing; after which it will develop production technology, conduct market research and take steps to commercialise applications. It has said this may take until 2030 because full assessment of the best products to put it into and of the marketability of those products will take time. Toray says it is precisely this marketability that will determine the first applications for its new, more sustainable nylon.

Ecofriendly demand

Nylon 66 has been used for many years in fibres, resins, and other applications because of its exceptionally durable, strong, and rigid properties, but the company acknowledges that pressure to develop an ecofriendly nylon 66 has

Research into the possibility of making bio-based adipic acid began at Toray in the 2010s.

ALL CREDITS: TORAY





Nylon fibres. Toray has been manufacturing these products on a large scale for more than 70 years.

increased in recent years.

It explains that a particular challenge manufacturers face is that conventional chemical synthesis for producing adipic acid for production of nylon 66 generates a potent greenhouse gas called dinitrogen monoxide. Its new technique, it insists, is free of dinitrogen monoxide emissions.

It says the achievement is partly attributable to joint research it has carried out with the National Institute of Advanced Industrial Science and Technology, and RIKEN, Japan's largest comprehensive research institution, starting in the 2010s.

The company is aware of developments elsewhere in the market to introduce fibres made with, in part, renewable raw materials replacing materials derived from petrochemicals. However, it says that these will still leave the way clear for the developments it is working on. "Bionylon 66 is currently not available on the market," the Japanese group says, "and existing biomass-nylon products have different physical properties." Its belief is firm that demand for its bionylon 66 will be strong.

Part of a far-reaching strategy

It is more than 70 years now since Toray began to manufacture nylon fibres on a large scale and it says features such as high levels of tensile strength, abrasion strength, and chemical resistance, as well as good colour development properties, have allowed it to achieve success in this area. Its nylon fibres are in extensive use in swimwear, skiwear and baselayer garments.

Long before this, at the group's inception in the 1920s, it has had at the core of its activity the conviction that materials can change lives, that its technology can "provide real solutions to the challenges the world is facing". It says that,

“Reducing the use of fossil fuels is part of a drive towards helping to create what Toray calls ‘a recycling-based society’.”

in the twenty-first century, the greatest of these challenges is sustainability.

Managing resources sustainably is one of the four pillars of the group's wider corporate social responsibility programme. A society that is managed in a sustainable manner will be one that makes effective use of limited resources, it states. Reducing the use of fossil fuels is part of that, and part of a drive towards helping to create what it calls "a recycling-based society". Developing products such as biobased adipic acid is, therefore, part of a wider effort to create renewable products, using plants and other biological resources to replace hydrocarbons.

Good for business

As is clear from the strategy it has outlined for the adipic acid concept, commercialising these products effectively is also part of its philosophy; commercial success is a key part of a sustainable business because a group that does not bring in revenues cannot continue to operate for long.

But Toray views innovation in more sustainable solutions as beneficial to the business. It calculated that sales revenues from products that were part of what it calls "green innovation" reached around \$3.9 billion in its 2013 fiscal year. Seven years later, the figure for the 2020 fiscal year was \$4.9 billion. Its target for 2030 is to achieve revenues of almost \$7 billion from these products. 



Mission and vision

Fashion for Good is a unique organisation that selects promising start-ups working on sustainable solutions for all stages of the textile and apparel supply chain. To accelerate their development and help bring their innovative products or processes to market, the Amsterdam-based body connects them with fashion and sportswear brands and retailers. It also provides assistance in accessing funding. This novel platform has actively contributed to drawing attention to and attracting investors to support an impressive array of sustainable concepts. Katrin Ley has headed the organisation since its founding. Six years on, she says it is at a turning point and ready to take on the second stage of its mission.

What are the specific services and support that Fashion for Good provides the sustainable textile-tech start-ups it selects?

When we launched, we saw ourselves as an accelerator, but we now prefer to use the term incubator. At the time, the start-ups we selected would have access to a three-month mentoring programme. Now we provide year-long services that include impact measurement and methodology. Over the years, we have learned a lot and understand better how the apparel industry works. We have found that bringing CEOs and founders together has been very helpful for start-ups.



DIALOGUE

Katrin Ley, managing director, Fashion for Good



Fashion for Good also operates a museum where it stages exhibitions on sustainability and innovation.

CREDIT: ALINA KRASIEVA

Katrin Ley, managing director, Fashion for Good.

CREDIT: FASHION FOR GOOD

“We bring together corporations that are inherently risk-averse with start-ups that are by nature risk-prone.”

KATRIN LEY, FASHION FOR GOOD



Our early work focused mostly on innovators based in the United States and Western Europe, fewer were in Asia. In 2020, we launched a fresh innovation platform for start-ups based in countries closer to the global supply chain to have more impact, in India, China, Bangladesh and Indonesia. This has led to a project seeking to turn agro-industry waste into feedstock for new materials.

Among all the projects supported by the organisation since it launched, what has been the success rate, if that is a notion that applies to these endeavours?

We strive first, of course, to select the most promising companies and have scouted 2,500 innovators. Among these, 160 start-ups have gone through the Fashion for Good programme and one-third have been implemented. Our platform has also helped launch 326 pilot projects. This has enabled us to evaluate each technology, its cost-competitiveness and verify that it has a positive impact. Among the 160 innovators that have been incubated, not all have reached industrial scale, but many have been able to access recurring or continuous business. Infinited Fiber has been able to attract commitments to buy from Inditex, the owner of Zara. PVH, Zalando and adidas have also made commitments to some of the start-ups we support. Some of these have made it to the market, such as a gilet made by Pangaia from Natural Fiber Welding's Mirum.

Have you found that there is a recipe for success that makes some projects take off?

We have found that it is often just a function of time. Developing a new technology takes time, and with time, it reaches its tipping point. In the first five years of our activity, we have helped create that space for innovative companies. Now, as we move on to the next five years, we are looking to scale the projects we back.

What type of projects do you see as having the most potential to scale and how do you plan to move on to this second stage of Fashion for Good's agenda?

We will continue to support new and promising solutions in all areas of the textile and apparel industry, but we have identified those projects that have the potential to be scaled up. In recycling, real progress is underway, as we have seen at Renewcell, Infinited Fiber and Circ (start-ups incubated in 2020, 2017 and 2018 respectively). In denim processing, we see great promise at Stony Creek, with its natural indigo process, as well as at Huue, a company developing a biotech indigo pigment. We are also focusing on pushing for cleaner processes within the industry as part of our "Dry Factory of the Future" programme that seeks to encourage the industry to switch from wet to dry processes to save water and energy. This is a space where the payback may be faster than innovation in materials which can have long lead times. Renewable energy is another low hanging fruit that we promote and that companies may be more willing to invest in.

Many of the research programmes set up by Fashion for Good require that companies from all stages of the supply chain work together. Collaboration is arguably fundamental to developing and scaling new technologies in textiles and apparel. How easy, or difficult, has it been to convince companies to pool their resources?

From the very foundation of Fashion for Good, we designed it to be a space for pre-competitive collaboration. This is not uncommon in the world of sustainability, but it is not so common in the field of innovation, which companies often consider a key differentiation point. I think we've been able to prove that there is a real benefit in working together and that it makes sense to collaborate when taking on challenging projects that are risky and R&D heavy, as is any new

The façade of Fashion for Good's headquarters in Amsterdam.

CREDIT: PRESSTIGIEUX

technology related to circularity. Companies understand that it makes sense to learn together, even that it makes business sense for the more challenging projects. But it makes collaboration even more difficult because we are bringing together corporations that are inherently risk-averse with start-ups that are by nature risk-prone.

Some technologies are easier to set up, particularly the digital concepts, such as Textile Genesis' digital tracing solution which Fashion for Good supported four years ago. The programme covered the entire supply chain from fibre to finished product and involved Kering, Bestseller and three viscose producers. Its goal was to prove the interoperability of Textile Genesis' solution. For the New Cotton Project, a programme looking into the recycling of cotton waste into manmade cellulosic fibres (MMCFs), twelve organisations worked together, including Infinited Fiber, adidas, H&M, Kipar, Inovafil, and Tekstina.

How does Fashion for Good choose the industry partners that are involved in its innovation programmes?

We have a very stringent process for onboarding industry partners. We have chosen only 25 companies, but they collectively represent 12% of the industry. Our selection process follows a highly curated path to identify the corporations that are willing to work with innovators, are committed to investing in novel materials and processes and have in-house R&D capabilities. Fashion is generally considered a creative industry, but many of the technologies it uses haven't changed in decades. We have also deliberately chosen to work with both large and small organisations. Adidas, Levi's, Bestseller and Zalando joined our programme when we first started, but smaller brands such as Pangaia and Norrona are also Fashion for Good partners. We also take into account a company's leadership and its commitment to innovation, as seen at Arvind, Paradise or Shahi for instance.

How are Fashion for Good's activities financed?

Our seed funding was provided by the Laudes Foundation, and our operating costs are covered in part by our partnership fee-based model. Each project receives funds on a case-by-case basis. We also have access to outside funding, from the European Union as well as from investors and venture capital (VC) firms. When we started, very few VC funds were ready to invest in innovation in textiles and apparel, but this is changing. We have good relationships with companies such as Prelude Ventures and Breakthrough Energy. When VCs show interest in a start-up, it helps de-risk the projects we support. Venture capital was on a fast growth path over the past ten years, and it may be more difficult in today's context to attract funding, but sustainability remains an important driver for investment. Through our network, a company like Infinited Fiber was able to access other sources of



capital. Venture money may not finance the construction of a factory, but debt financing can. It is a new challenge for us, as we need to identify new sources of funding and financiers.

Innovation in new, more sustainable materials and processes requires investment and can be added costs to manufacturing. This is often a barrier to wide scale adoption within the textile and apparel industry. Do you see any signs of change, or will this remain an obstacle to their market success?

In this area, we see legislation as critical. A certain measure of sticks and carrots is needed to bring these new materials and technologies to market. Our hope is that the European Union will help make this possible. Though legislation may have some unintended negative consequences, it is to a large extent beneficial. The EU's waste directive, for instance, could help recycling solutions gain access to the feedstock they need to scale. The directive for eco-design is another area important to our work. Directives could also be used to better align supply and demand. We are active in Brussels to bring our innovative vision to European policy makers. We share our learning with policy makers on matters of transparency and traceability, such as the Digital Product Passport. Sorting for circularity is a big European project, and we have similar programmes underway in India and in the United States. 🌍

A hoodie developed by adidas as part of the New Cotton Project was exhibited in the Fashion for Good museum.

CREDIT: ALINA KRASIEVA

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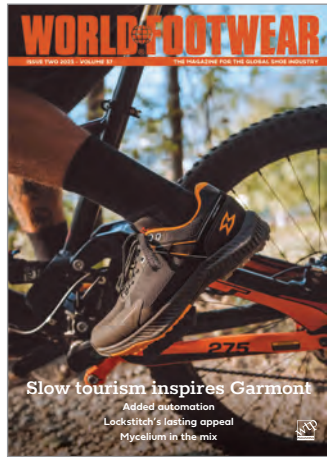
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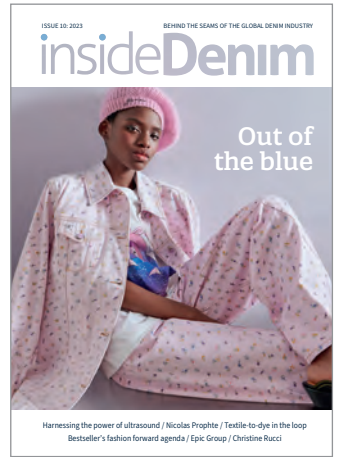
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