

The European apparel market and sustainable fashion

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Many buyers in Europe are increasing their efforts and demands in terms of sustainable production and social responsibility. This is because of growing awareness among consumers of the negative environmental and social impacts of fashion as well as an increasingly strict regulatory environment. Manufacturers who can adapt their supply chains to meet these demands will be well placed to take advantage of opportunities in this area.

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1. Brand commitments

Major apparel brands and retailers across all price/value segments are stepping up their commitments to use more sustainable materials. In the sustainable cotton ranking, for instance, [Adidas, IKEA, H&M, C&A and OTTO Group lead the way](#). European buyers are also providing information to consumers about the materials used in their products (such as manufacturing location, fabric composition, finishing and even production methods), including information about why certain materials within the collection are more sustainable.

2. Industry-wide initiatives

Fashion brands and retailers, pressure groups, solution providers and individuals from across the industry have come together in several platforms, programmes and pledges to find and implement solutions to fashion's most pressing issues and to challenge fashion's traditional linear 'take-make-waste' system. Examples include:

- [Sustainable Apparel Coalition \(SAC\)](#), a multi-stakeholder non-profit alliance that promotes social justice and works to reduce environmental impact.
- [ZDHC \(Zero Discharge of Hazardous Chemicals\)](#), a multi-stakeholder organisation dedicated to reducing the industry's chemical footprint.
- [Fashion For Good \(FFG\)](#), an innovation platform that connects sustainable innovators with brands, retailers, manufacturers and funders.
- [H&M Global Change Award](#), an accelerator for early-stage sustainable innovation.
- The [Textile Exchange's 2025 Sustainable Cotton Challenge](#) to source 100% of their cotton from the most sustainable sources by 2025.
- The [German Textile Partnership](#), in which apparel companies agreed to use 70% sustainable cotton by 2025, of which 20% must be organic cotton.

- The [Charter for Climate Action](#), a pledge of over 40 large fashion brands to achieve net zero emissions by 2050.

Figure 1: Sustainable Cotton Ranking: how global brands score on policy, traceability and actual uptake of sustainable cotton



3. Circularity and the EU Green Deal

Launched in 2019, the European Union’s ‘[Green Deal](#)’ aims to remake Europe into the ‘first climate-neutral continent’ by 2050. It is a growth strategy ‘to move to a clean, circular economy and stop climate change, revert biodiversity loss and cut pollution’. Europe is trying to achieve this goal through legislation, large investments in clean technologies and new business models. Concrete legal measures to help formalise the sustainable transition should be expected from 2021 onwards.

This includes legislation on:

- [Due diligence regarding human rights and environmental protection](#) (CSRD);
- A new ‘[carbon border adjustment mechanism](#)’ (CBAM) that imposes a tax on exports to the EU from countries that do not impose a carbon constraint on their industries;
- [Extended producer responsibility](#) (EPR), an initiative to make companies financially responsible for the environmental costs of textiles during their lifecycle;
- The ‘[right to repair](#)’ for consumers.

Why are sustainable materials important?

Materials (fabrics) can generate a direct, negative impact at each stage of the garment lifecycle, from cultivation and production of fibres to garment end of life.

Table 1: Negative impacts at each stage of the apparel-making process

Raw materials extraction/cultivation	Materials production	Garment production	Use	Disposal
Water usage	Water usage	Post-industrial material waste/scraps	Lack of fabric durability	Non-recyclable composition
Fertiliser usage	Energy usage		Dry-clean only	Non-biodegradable
Pesticide usage	Use of harmful chemicals/dyes		Microplastics shedding/pollution	
Land usage	Air pollution/ Greenhouse gases			

Use and/or treatment of animals	Water pollution			
Depletion of resources				
Poor working conditions				

Source: [FT Journalistiek](#)

Garments that are not recycled, upcycled or repaired often end up in landfills or are incinerated. Many materials are not biodegradable. Furthermore, a big determinant of recyclability is fabric composition (many blended fabrics are harder to recycle).

The production of petroleum-based synthetic materials (those made from fossil fuels, such as polyester, nylon and acrylic) generates a large amount of greenhouse gases. When washed, clothing made from these fibres also releases microplastics into oceans, lakes and other waters.

Some fibres and materials (for example cotton) require a lot of water, land, energy and/or chemicals to produce. Animal-derived natural fibres and materials (such as down feathers and wool) are often obtained from animals that have been subjected to unnecessary suffering (e.g. live plucking, force feeding or [mulesing](#)).

What makes a material sustainable?

A material can be considered more sustainable if it is produced, and can be maintained or disposed of, in a way that is considerate of humans, social justice and the environment. Such materials may be:

- Manufactured from inputs and materials that cause less harm to the environment during production;
- Manufactured from materials that are already in circulation (non-virgin materials, waste materials and manufacturing by-products);
- Manufactured from inputs and materials that cause less harm to the environment during disposal (e.g., biodegradable);
- Manufactured using sustainable processes that use less water, energy, pesticides, fertilisers and/or harmful chemicals;
- Obtained from animals that have been treated humanely;
- Of decent quality and durability so as to lengthen the product (garment) lifecycle;
- Manufactured by organisations employing socially-compliant practices, including:
 - Workplace health & safety;
 - Payment of a living wage/fair wage;
 - Lack of child or forced labour;
 - Decent working conditions.

Tips:

Check the [ITC Standards map](#) for a comprehensive list of independent standards covering environmental impact and traceability.

Check Solidaridad's [Wet Processing Guidebook](#) for an extensive overview of industry initiatives, tools, certificates, guidelines and strategies for reducing social and environmental impacts during the wet-processing stage of material production.

Check the so-called '[Five Freedoms](#)'. This a commonly used framework in Europe for assessing animal welfare. Animal rights advocacy group Four Paws has translated the 5 freedoms into [a set of recommendations for animal welfare](#).

Read the CBI studies [The sustainable transition in apparel and home textiles](#) and [The EU Green Deal - How](#)

[will it impact my business?](#) for more background information about the growing market for sustainable apparel in Europe, its origins, new policies, and strategies to switch to sustainable production.

4. What requirements must sustainable materials comply with to be allowed on the European market?

For all materials (including sustainable materials), you need to comply with several requirements, some of which are mandatory, whether they are legal requirements or not. Others are voluntary, but meeting them can give you a competitive advantage.

What are mandatory requirements?

There are several mandatory requirements you must comply with if you want to export apparel to Europe. These include legal requirements concerning the use of chemicals as well as non-legal requirements. In addition, many buyers have created non-negotiable terms and conditions for all their suppliers. These generally include standards and certifications regarding raw materials testing, product performance, product safety, labelling and environmental and/or social impact.

Legal requirements

[REACH](#) is the EU Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals.

The European Union has restricted the use of several chemicals in textile products because they pose a health risk for consumers. In textile products that come into contact with the skin, flame retardants are restricted. Often-used flame retardants are Tris (2,3 dibromopropyl) phosphate (TRIS), Tris (aziridinyl) phosphineoxide (TEPA) and polybromobiphenyles (PBB). Azo dyes are often used in the dyeing process for textile products. Certain azo dyes are carcinogenic and may not be used in consumer products in Europe.

Non-legal mandatory requirements

When you do business with a European buyer for the first time, they will typically give you a contract and/or a supplier manual to sign. By signing either of these, you confirm that you will comply with all the listed requirements. Ultimately, you are responsible for enforcing these requirements at your facility and within your own upstream supply chain. You will be held accountable in case of a problem at your (or one of your suppliers') facilities or with the product, including any problems discovered after the delivery of an order.

- Brands and retailers may require that social and environmental audits of raw materials production facilities are conducted, either by the brand/retailer itself or by an independent third party. These audits may be announced or unannounced. Factories and mills that do not allow full access will usually be blacklisted and will not receive future orders.
- Many brands have created their own Restricted Substances List (RSL), based on industry and regulatory standards, that suppliers of both materials and garments need to follow. Complying with REACH and customer-specific requirements can be challenging. With small orders, most European buyers will not ask for testing, but if illegal chemicals are discovered after delivery or products do not perform to standard, you will have to bear all the costs involved.
- Many buyers distribute a supplier Code of Conduct as part of the supplier manual. This Code of Conduct outlines the buyer's values and policies with regard to key topics and is intended to ensure that suppliers understand and comply with required ethical standards. It may cover the following aspects:
 - Child labour
 - Forced labour and overtime
 - Health & Safety
 - Discrimination
 - Fair remuneration

- Environment
- Business integrity and conflicts of interest
- Intellectual property

Tips:

Audit your own mills and/or facilitate the execution of buyer or independent audits at your mills.

Ask your buyer if they use a Restricted Substances List (RSL). These are often inspired by the guideline on safe chemical use from the ZDHC foundation. Download the ZDHC [Conformance Guidance](#) here.

Share your buyers' RSL with your raw material suppliers.

Specify the material content of every item that you export to the EU, in accordance with EU [Regulation 1007/2011](#). Check the [EU Access2Markets online helpdesk](#) for information about how to do this.

Search online for documents created and published by brands outlining their expectations of suppliers regarding CSR (Code of Conduct) or use of chemicals (RSL - Restricted Substances List).

Ask buyers for their supplier manual, which should include all legal and non-legal requirements.

Develop your own Code of Conduct, for instance [based on the BSCI principles](#), and communicate this to your suppliers.

What additional requirements do buyers often have regarding sustainable materials?





European buyers are always looking for special materials or production methods that will help them stand out in the market in terms of sustainability. Suppliers should be proactive in finding, developing and implementing new solutions that facilitate the development and marketing of more sustainable products. Preferred suppliers are increasingly expected to showcase regular design collections with original fabrications that incorporate new sustainable techniques.





Certifications


Buyers are increasingly requiring that facilities, products and/or materials are independently certified regarding the use of harmful substances, environmental impact and social responsibility. The certification process can be time-consuming, but obtaining certification demonstrates a commitment to sustainable practices throughout your supply chain. Key certifications include:

Table 2: Key certifications for sustainable materials in the European apparel market

Name	Logo	Description	Further information
OEKO-TEX® 100		Tests fabrics and accessories for substances considered harmful to human health . Most European brands require that products carry the Oeko-tex quality mark.	Check the STANDARD 100 by OEKO-TEX® application process here

<p>OEKO-TEX® STeP</p>		<p>Social and environmental certification system for brands, retailers and manufacturers in the textile and leather industry. Certification is suitable for production facilities at all processing stages.</p>	<p>Check the OEKO-TEX® STeP application process here</p>
<p>EU Ecolabel</p>		<p>The EU Ecolabel is a voluntary label for products and services with a reduced environmental impact. It is awarded only to products with the lowest environmental impact in a particular product range.</p>	<p>Check the EU Ecolabel application process here</p>
<p>BCI</p>		<p>The Better Cotton Initiative (BCI) is a non-profit, multi-stakeholder governance group that promotes better standards in cotton farming and practices across 21 countries.</p>	<p>Check the BCI membership process here</p>
<p>GOTS</p>		<p>The Global Organic Textile Standard (GOTS) is the leading standard for organic textiles. It applies to the harvesting of raw materials, environmentally and socially responsible manufacturing and labelling.</p>	<p>GOTS provides a list of organisations that can perform an audit</p>

C2C	 <p>The logo features two interlocking circles, one green and one blue, with the word "CERTIFIED" in white capital letters inside the white space between them. Below the circles, the words "cradle to cradle" are written in a bold, blue, lowercase sans-serif font. A registered trademark symbol (®) is located in the top right corner of the logo area.</p>	<p>Cradle to Cradle Certified® is a third-party certification programme and a standard for materials and products considered to be safe, circular and responsibly made. Products are assessed according to 5 categories of sustainability performance: material health, product circularity, clean air and climate protection, water and soil stewardship, and social fairness.</p>	<p>Check the C2C® certification process here</p>
Bluesign®	 <p>The logo consists of a dark blue square with the word "bluesign" in white lowercase letters. A registered trademark symbol (®) is positioned to the upper right of the text.</p>	<p>The use of Bluesign®-approved chemical products and materials increases the safety of products and minimises risks for companies throughout the value chain. Bluesign®-approved textiles have been sustainably produced and assessed according to the Bluesign® criteria.</p>	<p>Learn more about the Bluesign® assessment process here</p>
ZDHC	 <p>The logo features a black circle with a white diagonal slash through it, followed by the letters "ZDHC" in a bold, black, uppercase sans-serif font.</p>	<p>A multi-stakeholder programme that leads the apparel industry in eliminating harmful chemicals from supply chains.</p>	<p>The ZDHC provides a guide that outlines the requirements for indicating ZDHC MRSL conformance</p>
Sedex	 <p>The logo shows the word "Sedex" in a large, bold, black, lowercase sans-serif font. To the right of the text is a red circle containing a white stylized number "7".</p>	<p>Online platform for companies to manage and improve working conditions and environmental protection in global supply chains, from raw material production to garment manufacturing.</p>	<p>Check the Sedex certification process here</p>

Fair Trade	 <p>FAIRTRADE INTERNATIONAL</p>	Fair Trade is a non-profit organisation that focuses on smallholder farmers and workers in developing countries. It is a movement to reduce poverty and promote fair and equal opportunities. It is also a quality mark for products for which a fair price has been paid.	Check the Fair Trade certification process here
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Other fibre or process-specific certifications are listed further down in this report under Sustainable Fibres and Raw Materials. These are used to demonstrate a material's lower social and environmental impact.

Supply Chain Transparency

Supply chain transparency is key for the European apparel industry, motivated by ever stricter laws at both the EU and national levels. For instance, the EU's new Corporate Sustainability Reporting Directive (CSRD) will require all large European companies, from 2023 onwards, to disclose how they manage social and environmental challenges. Transparency means you should disclose information about your own operations to buyers, but also help them gain as much insight as possible into their (and consequently your) entire supply chain.

Read more about how to comply with transparency requirements on the websites of the [Clean Clothes Campaign](#) and [Human Rights Watch](#). Many European companies have published the names of their suppliers in the [Open Apparel Registry](#). To see how European brands are doing according to Fashion Revolution, check their [Transparency Index](#).

There are many different tools that can help you map your supply chain:

- [Sourcemap](#) helps you maintain an up-to-date visualisation of raw material producers, mills, wet-processors and manufacturers, their compliance with industry standards and CSR risks.
- [Supplyshift](#) offers a cloud-based platform to support companies in measuring risks and improving supplier performance throughout the supply chain.
- [ChainPoint](#) is a software platform for monitoring and securing supply chains. It lets you manage and share product, process and supplier information, from raw material to finished product.
- [String3 | Historic Futures](#) helps you find out where and how your products are made, pinpoint high-risk areas and focus your solutions.
- [Ecovadis](#) profiles and maps your supply base for ethical, social and environmental risk, using predictive intelligence to manage CSR risks.
- [Amfori BEPI](#) is an online platform for environment-related supply chain information that lets companies add their producers and map their supply chains.
- [Sedex](#) offers an ethical data platform and support to companies that want to map their supply chains.

Tips:

Understand what the different Eco certifications and labels mean (check the [ITC Standards map](#) for information). Incorporate them into your collections and showcase these innovations with hangtags and product explanations. Group collections by sustainable fabric theme.

Provide buyers with as much information about your product as possible. The more information you can give about the origin of your materials, the better.

Keep up to date with the latest in voluntary certification schemes by researching brands and how they

market their products, and by attending tradeshow.

All products in your collection should be tested before presentation to the buyer. Don't present a product unless you are satisfied it will conform to their standards.

Establish an internal raw materials (yarn and fabric) function to ensure that your company is always at the forefront of new innovations.

Look at how brands and retailers are marketing themselves in terms of sustainability. Position yourself as a sustainable, ethical supplier and reflect this in your own marketing and storytelling.

Create a professional English language website. Share information about the initiatives you are involved in and the sustainable materials you use through a journal or blog.

Research innovations in sustainable packaging materials and make proposals to your buyers.

5. Innovation in sustainable materials

The industry is constantly innovating in fibres, other raw materials and wet-processing techniques to become more sustainable. Next-generation eco-fibres can be used alone or blended with other types of fibres to make new materials. Many of these are branded and/or patented and some offer interesting additional (performance) features and properties.

To help buyers, product developers and designers choose more sustainable fibres in their collections, Dutch industry association [Modint](#) has developed a helpful benchmark called the [Modint Fibre Matrix](#) (MFM, see below). The MFM focuses on the most-used and commercially available fibre materials and ranks them as conventional, preferred, better and best options.

The MFM only covers raw material extraction and primary processing. The materials have been assessed using 5 parameters: climate change, energy use, water use, land use and circularity. Read the [free online report](#) for more information about the methodology used to rank the fibres.

Several fibres that are listed in the MFM (and several materials that are not) are described in more detail in the following paragraphs.

Figure 2: Modint Fibre Matrix



Source: [Modint Fibre Matrix](#). ©Modint

Preferred man-made regenerated cellulose fibres

Man-made cellulose fibres are derived primarily from wood pulp or other sources of cellulose such as bamboo. The chemical process for creating fibres such as rayon, modal and viscose can be very toxic, even though it is more sustainable than the creation of petroleum-based fibres such as polyester. Preferred man-made cellulose fibres are those that are derived from sustainably managed forests and/or have a production process that is efficient and not chemically intensive. The Austrian company [Lenzing](#) is the industry leader in preferred man-made cellulose fibres.

- Lyocell is a man-made cellulose fibre derived from wood pulp, most commonly from eucalyptus trees. Unlike modal or rayon, it is obtained by using an organic solvent spinning process within a closed-loop system that recovers 99% of the solvent required. Lyocell is already widely used across the fashion industry. Lyocell brand [TENCEL™](#) (by Lenzing) uses sustainably sourced wood, certified by the Forest Stewardship Council

(FSC).

- **ECOVERO™** is a viscose fibre produced by Lenzing using eco-responsible production practices that lead to less water impact and lower carbon dioxide emissions than conventional viscose. **ECOVERO™** fibres are certified with the EU Ecolabel.
- **SeaCell™** (by SmartFiber AG) is a fibre made from renewable resources - wood and seaweed - using energy and resource-saving methods.

Bio-based fibres and materials

An increasing number of bio-based substitutes for leather, fossil fuel-based synthetics and other less sustainable fabrics are entering the market. Many are vegan and use by-products of other industries including the agriculture and food industries in a closed-loop system. They are generally bio-degradable and/or involve a process with a lower footprint. Many newer and patented options are only known by their brand names.

- **Piñatex®** (by Ananas Anam) is a natural textile made from the leaves of the pineapple plant, which are usually discarded or burned. In addition to being circular, it creates new income streams for subsistence farmers.
- Wine (or grape) leather is a vegan leather made by **VEGEA®** that uses waste products from the Italian winemaking process. It has a high content of vegetal, renewable and recycled raw materials. It is 100% recyclable.
- **Orange Fiber** is a silky fibre made from citrus juice by-products. It was first included in the H&M Conscious exclusive collection in 2019. Recently, Orange Fiber started a collaboration with Lenzing to produce a **TENCEL™** branded lyocell fibre made from orange pulp and wood sources.
- **Woolcoo** is an animal-free wool made using coconut fibre excess from the food industry combined with hemp fibres.
- **Brewed Protein™** (by Spiber Inc.) fibres are made from structural proteins produced by microbial fermentation in a process that uses plant-based materials such as sugars.
- **QMILK** is a milk protein fibre made from non-food milk and renewable raw materials. It is silky soft and has anti-bacterial properties.
- **Polylactic acid** is a biodegradable natural polymer produced from renewable sources. It is mainly extracted from corn, cassava, wheat, straw and other crops that contain starch and spun into polylactic acid fibre.
- **FLOCUS™** is the branded name for kapok textile fibres and materials. Kapok fibre is picked directly from the kapok tree, which needs no irrigation, pesticides or fertilisers, can grow on difficult terrain including mountains, and absorbs carbon dioxide from the atmosphere. **FLOCUS™** materials also offer other properties including moisture management, temperature regulation and insect repellence.
- Soybean protein fibre is made from by-products in the soy food industry that produces soymilk, soybean oil, tofu etc. Left-over fibres from the wet-spinning process are used as animal feed so there is no waste.

Figure 3: Conventional cotton and polyester still dominate the apparel industry, but sustainable materials are increasing, including fibres made from wood pulp, cotton cuttings and agri-food by-products such as pineapple leaves



Photo by [Evan Wise](#) on [Unsplash](#)

Recycled fibres and recycling technologies

Brands and retailers in Europe are increasingly demanding recycled content in their products, in line with new EU regulations that aim to promote a 'circular economy' by increasing circularity in textiles. Fibres can be recycled from pre-consumer waste (e.g. fabric scraps from the cutting room) and/or post-consumer waste (garments used and discarded by consumers). Fibres can also be produced from the recycling of other materials (such as plastic bottles) to make new fabrics.

- Cotton fabric can be mechanically recycled into cotton fibre for use in new textile products in a process that

saves water and energy and diverts waste from landfills. The quality of recycled cotton fibres may be inferior (due to shorter fibre lengths), which is why they are usually blended with virgin cotton. Branded recycled cotton fibres include [Recover™](#).

- [ECONYL®](#) is the industry's leading branded product that uses nylon waste (from old carpets, fishing nets and pre-consumer waste) to create regenerated nylon that has the same properties, performance and quality as new nylon. It has been adopted by a large number of lingerie and hosiery brands, as well as high-performance swimwear, sportswear and outdoor apparel brands globally.
- [REPREVE®](#) (by Unifi, Inc.) is the world's leading recycled fibre. It is a durable performance polyester fibre (with wicking, thermoregulation and water repellent properties) made from recycled post-industrial plastic waste, including plastic bottles. It is used extensively in the sports and activewear segments but is also widely adopted in the fashion segment.
- The production of [REFIBRA™](#) (by Lenzing) involves upcycling cotton scraps from garment production. These cotton scraps are turned into cotton pulp which is added to wood pulp. The combined raw material is used to produce virgin [TENCEL™](#) Lyocell fibres.
- [Infinited Fiber's](#) patented technology takes cellulose-rich waste that would otherwise be landfilled or burned – old textiles, used cardboard, crop residues like rice or wheat straw, and more – and transforms it into premium-quality fibres for the textile industry.

The following standards are the most common in the European market for recycled base materials:

- The Recycled Claim Standard ([RCS](#)) tracks recycled raw materials through the supply chain using the chain of custody requirements of the [Content Claim Standard](#).
- The Global Recycled Standard ([GRS](#)) is a product standard that incorporates recycled material verification, social and environmental responsibility criteria, as well as chemical management.

More sustainable natural fibres and materials

On the one hand, natural fibres can be considered sustainable as they are renewable, biodegradable and often durable. On the other hand, depending on how they are extracted, cultivated and/or processed, they may be considered unsustainable. For example, the growing of conventional cotton requires large amounts of water, fertilisers, pesticides and chemicals.

- The use of bio (or organic) cotton is increasingly becoming a requirement, particularly for mid to high-end fashion segments. This is cotton grown without the use of GMOs (Genetically Modified Organisms) and synthetic chemicals. Industry certification: [GOTS](#) (Global Organic Textile Standard). Read more about organic cotton in the [CBI study on sustainable cotton](#).
- The Better Cotton Initiative (BCI) is a non-profit that promotes better standards in cotton farming and practices across 25 countries. Better Cotton is sourced from licensed BCI farmers who have proven their commitment to continuous improvements in sustainability. Better Cotton currently accounts for 23% of global cotton production. Industry certification: [BCI Cotton Standard](#).
- Hemp is a strong, natural, sustainable fibre produced from the stems of the cannabis plant. It requires little water and almost no pesticides or fertilisers to grow. Hemp replenishes soil nutrients and also absorbs a large amount of carbon dioxide from the atmosphere.
- Linen is a strong, natural, sustainable fibre made from the fibres of the flax plant. Compared with cotton, linen requires less water to produce and it can be grown without pesticides and fertilisers. Like hemp, linen also absorbs a large amount of carbon dioxide from the atmosphere. Every part of the plant is useful in manufacturing various products, so there is very little waste.
- Producing wool is resource-intensive. It requires large amounts of land (for grazing sheep), water and chemicals. Furthermore, in many instances animals are not treated humanely. Responsible wool is wool that meets certain animal welfare and land management standards. Recycled wool is another very responsible option. Industry certifications: [RWS](#) (Responsible Wool Standard) and [GRS](#) (Global Recycled Standard).
- Responsible down is down obtained from animals that have not suffered unnecessary harm (such as force-feeding or live plucking). Industry certification: [RDS](#) (Responsible Down Standard)

Sustainable textile dyeing techniques and non-synthetic dyes

Wet processing (sizing, desizing, pre-treatment, dyeing, printing and finishing of textiles) is the most chemical and water-intensive stage of textile manufacturing. In addition, textile dyeing is the second-largest polluter of clean water, after agriculture. Some sustainable innovations in this area:

- [Living Colour](#) is a bio-design research project exploring the possibilities of natural textile dyeing with bacteria that produce pigments. Living Colour and PUMA have joined forces to present the very first bacterial-dyed sportswear collection.
- [DyeCoo](#) uses carbon dioxide (CO₂) to dye textiles in a process that does not require any water. CO₂-dyeing does not need added chemicals to dissolve dyes. The technology uses 100% pure dyes and, with a more than 98% uptake, produces very little waste. The CO₂ used is reclaimed from existing industrial processes, recycling 95% of it in a closed-loop system. The company has been able to scale the technology, which is now being adopted by a variety of mills and brands.
- The [We aRe SpinDye®](#) colouring method focuses on the colouration of recycled polyester material before it is extruded to fibre and spun into yarn. By melting colour pigments and the recycled polyester mass together, solid-coloured yarns are created without the use of water. The method reduces the amount of water used in the entire textile production chain by 75%. We aRe SpinDye® only uses recycled polyester made from post-consumer water bottles or used clothing, which allows the company to have a truly circular production method.
- [ColorZen's](#) revolutionary technology applies a patented treatment to raw cotton, making the cotton dyeing process faster, more efficient and less chemical, energy and water-intensive.

Natural colouring

Fabrics can be dyed using only natural raw materials. Examples of companies innovating in this area include [IndiDye®](#), [Rubia](#), [Fibre Bio](#) and [Greendyes](#).

- [Recycrom](#) creates a full range of pigment powders using textile fibres from used clothing and manufacturing waste. Through a sophisticated production process, fabric textile waste fibres are transformed into a fine powder that can be used as a pigment dye for fabrics and garments made of cotton, wool, nylon or any natural fibre and blend.
- [Colorifix](#) is the first company to use an entirely biological process to produce, deposit and fix pigments onto textiles, eliminating the use of harsh chemicals.

6. Where to find information on sustainable materials?

It is important to constantly stay on top of innovations in sustainable materials to maintain a competitive advantage. Information can be obtained from various sources and there are tools available to help you assess, and communicate, the environmental impact of your materials.

Some brands (such as Houdini and Patagonia) are increasingly 'open sourcing' their key sustainable styles, allowing anyone who is committed to developing sustainable products to access details about raw materials, techniques, processes and even materials suppliers. Other fashion players such as ASKET are, to some extent, following suit by being transparent about material sources, costing and providing a breakdown of a garment's environmental impact.

Trade Fairs

Visiting a trade fair is a good way to keep up to date with innovations in sustainable materials. The main fairs that showcase sustainable materials include:

- [The Future Fabrics Expo](#), London
- [Texworld](#), Paris
- [Premiere Vision](#), Paris
- [The London Textile Fair](#), London
- [Intertextile Shanghai Apparel Fabrics](#), China

Industry publications and initiatives

Online industry publications, such as the [Sourcing Journal](#), [Just Style](#) and the [Business of Fashion](#), publish information about new developments in sustainable materials. They also offer information about developments, collaborations and activities of initiatives, brands and retailers in this area.

The [H&M Global Change Award](#) and [Fashion For Good](#) websites, as well as in online industry publications, publish information about participants and winners of the H&M Global Change Award and the Fashion For Good/Plug and Play accelerator programme.

The Higg MSI (Materials Sustainability Index), developed by the Sustainable Apparel Coalition, is a tool to measure and score the environmental impacts of a large number of different material variations to support decisions about materials and create more sustainable products.

Tips:

Check the environmental impact of different textile and non-textile materials in The Sustainable Apparel Coalition's [Materials Sustainability Index](#).

Check the [Material District](#) or [Springwise](#) online databases to keep yourself updated on innovations in sustainable materials for apparel production.

Check Solidaridad's [Wet Processing Guidebook](#) for an extensive overview of industry initiatives, tools, certificates, guidelines and strategies for reducing social and environmental impacts during the wet-processing stage of material production.

Subscribe to online publications such as [Sourcing Journal](#), [Just Style](#) and the [Business of Fashion](#) for the latest news about sustainable materials.

Check out the websites of sustainable and transparent brands to obtain information about sustainable materials, techniques and suppliers. Example include [Houdini](#), [Patagonia](#) or [Asket](#).

Regularly visit your preferred mills and let them know you are interested in sustainable materials. Ask them to keep you up to date about their latest innovations in this area.

Monitor trends and developments in technologies and processes in your product area by visiting trade shows and events.

What are the most important market segments for products made of sustainable materials?

Premium consumers across lifestyle segments are generally willing to pay more for sustainable products. At the same time, many more price-conscious consumers expect brands to improve the sustainability of their materials without any impact on price, colour variation, performance or ease of care.

Luxury segment

Paying a higher price for luxury goods does not necessarily mean that they are ethical or eco-friendly. The European luxury segment has made a certain amount of progress in this regard. [Stella McCartney](#) is a leader in the sustainable luxury apparel segment, producing sustainable and cruelty-free designs and introducing innovative new sustainable materials. Stella McCartney has committed to using 100% recycled polyester by 2025. The company measures and communicates its greenhouse gas emissions as well as its targets to reduce them.

Upper-middle and premium lifestyle segments

Premium consumers are generally willing to pay more for products that are made with sustainable materials. Several young and emerging brands have created brand identities centre around environmental and social

awareness. In addition to more sustainable fabrications, buyers in this segment are also focusing heavily on developing more sustainable packaging material options. Sustainable fashion brands in this segment include [Organic Basics](#), [ASKET](#), [Mud Jeans](#), [Ecoalf](#), [Kings of Indigo](#), [People Tree](#), [Armedangels](#) and [Pangaia](#).

Budget and lower-middle price/value segment

Large mainstream fashion players in the budget and lower-middle segments are incorporating more established and readily available sustainable materials into their collections, such as organic cotton, recycled cotton and recycled polyester, at prices that do not differ significantly from the core collection. Examples include [Zara's 'Join Life collection'](#), [C&A's 'More Sustainable Collection'](#), [Primark's 'Sustainable cotton programme'](#) and the ['Primark Cares'](#) label.

- Zara aims to have at least 50% of all its items that are commercialised in 2022 manufactured according to the Join Life standards. It has also published its commitment that 100% of its cotton will come from more sustainable origins by 2023.
- H&M has stated that it will only source 100% recycled or more sustainably-sourced materials by 2030. The company uses its Conscious Exclusive Collection to test market response to early-stage innovations (that have not yet scaled production) in materials by companies that have participated in the H&M Foundation's Global Change Award.

Active, sports and outdoor segments

The promotion of sustainable and healthy lifestyles is an intrinsic part of the brand identity of sportswear, activewear and outdoor wear brands such as [Helly Hansen](#), [Houdini](#), [Haglöfs](#) and [Fjallraven](#). This explains their natural fit with environmental awareness. Petroleum-based synthetic materials and performance finishes are widely used in these segments and there is a lot of motivation for the development of sustainably produced high-tech performance fabrics.

Workwear segment

Already heavily regulated in terms of performance and safety standards, the workwear segment is a pioneer in sustainability, in particular in circular apparel. It includes brands such as [Blåkläder](#), [Helly Hansen Workwear](#), [Schoeller Textile AG](#) and [Schijvens](#). The biggest challenge is to source materials that are sustainable without compromising durability, protection or functionality. For more information about (sustainable) workwear, check the CBI study [Exporting workwear to Europe](#).

7. What are the prices for sustainable materials?

The price of sustainable materials is determined by the cost of inputs, farm practices and production processes, the need for certification, and scale. Even though solution providers, chemical companies, brands, retailers and industry-level initiatives have significantly invested in research & development to bring new technologies and sustainable materials to the market, the industry-wide implementation and scaling of new innovations is still limited.

The market for preferred fibres

According to Textile Exchange's [Preferred Fiber and Materials Market Report 2021](#), the market for preferred fibres grew significantly in 2020. Between 2019 and 2020, the market share of preferred cotton increased from 24% to 30% and the share of recycled polyester from 13.7% to 14.7%. Preferred cashmere increased its market share from 0.8% to 7% of all cashmere produced. The market share of FSC and/or PEFC-certified man-made cellulosic fibres increased to 55-60%. The market share of recycled MMCFs is only 0.4%, but according to Textile Exchange it is expected to increase significantly in the coming years.

However, preferred fibres only represent less than one-fifth of the global fibre market. Less than 0.5% of the global fibre market was from pre- and post-consumer recycled textiles.

Material prices

One of the most-used preferred fibres is organic cotton. The price for 1 kg of certified organic cotton differs per country of origin, but in all cases, organic cotton is more expensive to produce than conventional cotton. The price gap also differs per country. For example, in India and Turkey organic cotton is approximately 10% more expensive than conventional cotton. In China it is 15%–35% more expensive, according to the [Textile Exchange](#). Worldwide, the price of organic cotton is rising due to a mismatch between supply and demand.

The price of recycled PET flakes that are used to make recycled polyester was around €200 per tonne cheaper than virgin PET, until 2019. Since then, demand and price have grown substantially, thanks to growing interest from brands and retailers in more sustainable materials. Currently rPET is more expensive than virgin PET and recycled polyester is more expensive than virgin polyester.

The price point for sustainable materials such as [ECOVERO™](#) and [REFIBRA™](#) is higher than their conventional virgin counterparts. Innovative and still relatively small-scale materials such as [Orange Fiber](#), [Brewed Protein™](#) and [Piñatex®](#) can be substantially more expensive than the conventional materials they are considered to be an alternative to. [Piñatex®](#), for instance, is currently sold for €50 per 1.55 square metres. The same amount of conventional leather can be purchased in several production regions for prices starting at €15.

Retail pricing

Preferred fibres and materials have broken into the mainstream European apparel market. Demand primarily comes from large European retail chains, such as C&A, H&M and Tchibo, and from many smaller brand retailers, some with a distinct sustainable profile. Large retail chains can limit retail price increases by handling large-volume orders (C&A for instance manages to sell [organic cotton T-shirts for €6](#)), while smaller brands compensate for their relatively expensive input material with marketing.

This study was carried out on behalf of CBI by Frans Tilstra and Giovanni Beatrice for [FT Journalistiek](#).

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