

Fashioning a greener future

Article written by Lorenza Carta, September 2023

It is no secret that the fashion industry is one of the most polluting in the world, playing a significant role in global carbon emissions. With the urgency of combating the climate crisis on the rise, sustainable innovations are much needed to revolutionise the industry.

Textile usage in the European Union holds the disconcerting distinction of being the fourth most environmentally and climatically impactful consumption domain from a global life cycle perspective, after food, housing, and mobility. It is also the third highest area of consumption for water and land use, and fifth highest for the use of primary raw materials and greenhouse gas emissions.¹ The fashion industry is responsible for dumping up to 20% of the world’s wastewater, which often contains toxic chemicals and plastic microfibres.² And if this was not already disheartening, another alarming statistic emerges: around 60% of materials engaged by the fashion sector and 70% employed in household textile goods find their origins in polymers derived from fossil fuels.³

According to the European Commission, Europe generates 12.6 million tonnes of textile waste per year (Figure 1). Clothing and footwear alone accounts for 5.2 million tonnes of waste, equivalent to 12 kg of waste per person every year. Moreover, only 22% of post-consumer textile waste is collected separately for re-use or recycling, while the remainder is often incinerated or landfilled.⁴

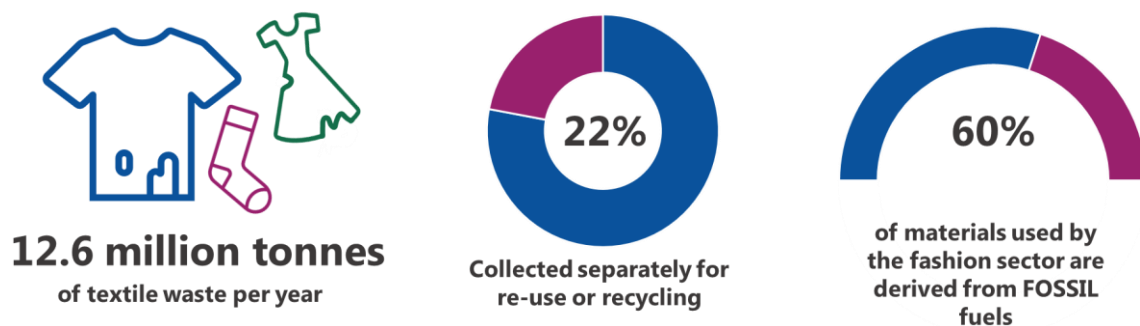


Figure 1. European figures on textiles industry.

¹ European Environmental Agency, 2022. *Textiles and the environment: the role of design in Europe’s circular economy*. Available at: <https://www.eea.europa.eu/publications/textiles-and-the-environment-the> [Last accessed September 2023].

² European Parliament, 2020. *The impact of textile production and waste on the environment (infographics)*. Available at: <https://www.europarl.europa.eu/news/en/headlines/society/20201208STO93327/the-impact-of-textile-production-and-waste-on-the-environment-infographics> [Last accessed September 2023].

³ European Environmental Agency, 2021. *Plastic in textiles: towards a circular economy for synthetic textiles in Europe*. Available at: <https://www.eea.europa.eu/themes/waste/resource-efficiency/plastic-in-textiles-towards-a> [Last accessed September 2023].

⁴ European Commission, 2023. *Circular economy for textiles: taking responsibility to reduce, reuse and recycle textile waste and boosting markets for used textiles*. Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3635 [Last accessed September 2023].

A brighter future ahead?

The EU, though, is hopeful the damaging model of consuming clothing could soon be a thing of the past.

In July 2023, the EU Commission proposed new rules, which follow the EU Strategy for Sustainable and Circular Textiles (March 2022), aimed at addressing the lifecycle of textile products, and including proposals to change how textiles are produced and consumed. The European Commission set the goal for all textile products placed on the EU market to be durable, repairable, and recyclable, and to “make fast fashion out of fashion”, by 2030.⁵

EU Commission’s new proposal also included introducing mandatory Extended Producer Responsibility (EPR) schemes, similar to those that have been used to manage waste from packaging, batteries, and electric and electronic equipment. The Commission will require producers to cover the costs associated with the end-of-life management of their products, which should also encourage them to reduce waste and increase the circularity of textile products – designing better products from the start. How much producers will pay to the EPR scheme will be adjusted based on the environmental performance of textiles, a principle known as ‘eco-modulation’.⁶

In March 2023, the Commission also adopted a proposal for a Directive on Green Claims. The EU estimates that more than half of these claims, or “eco-labels” are misleading.⁷ According to the not-for-profit, Changing Markets Foundation, some of the worst offenders making false or misleading claims are H&M, ASOS, and M&S.⁸ Green claims in the fashion industry cover multiple aspects of the clothing production process, either associated to climate (neutrality), circularity (recycling), or materials (natural and recycled fibres).

A major problem arises when some brands market themselves as sustainable, advertising the incorporation of a small percentage of recycled materials in their collections as “green” or “circular” without providing transparency or addressing the entire life cycle of their products. Many rely on recycled polyester, also known as recycled polyethylene terephthalate or rPET, for their sustainability strategy rather than investing in fibre-to-fibre recycling, a technology that requires rapid innovation and scaling. Because the technology for textile-to-textile recycling is still in its infancy, with less than 1% of material used to produce clothing recycled into new clothing, most of the recycled polyester on the textile market primarily originates from plastics, especially bottles. This approach reduces plastic waste and has lower environmental impact compared to the generation of synthetic virgin polyester; however, it leads to a critical issue: bottles that have been turned into garments that are no longer recyclable, and the closed-loop bottle-to-bottle recycling system is broken. Another rationale for opposing the marketing of the use of recycled plastic fibres is its failure to address the related issue of microplastics release, which is unavoidable when using durable plastic fibres.⁹

⁵ European Commission. *EU strategy for sustainable and circular textiles*. Available at: https://environment.ec.europa.eu/strategy/textiles-strategy_en [Last accessed September 2023]

⁶ European Commission, 2023. *Circular economy for textiles: taking responsibility to reduce, reuse and recycle textile waste and boosting markets for used textiles*. Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3635 [Last accessed September 2023]

⁷ European Commission. *Green Claims*. Available at: https://environment.ec.europa.eu/topics/circular-economy/green-claims_en [Last accessed September 2023]

⁸ Changing Markets Foundation, 2021. *Synthetics Anonymous: fashion brands’ addiction to fossil fuels*. Available at: <http://changingmarkets.org/wp-content/uploads/2021/06/CM-EX-SUM-FINAL-ENGLISH-SYNTETHIC-ANONYMOUS-WEB-.pdf> [Last accessed September 2023]

⁹ Generation Climate Europe, 2021. *Greenwashing in the Fashion Industry | Policy Paper*. Available at: <https://gceurope.org/wp-content/uploads/2021/10/Greenwashing-Policy-Paper.pdf> [Last accessed September 2023]

In this context, the fashion industry should prioritise technological advancements and innovations that support textile-to-textile recycling, reducing waste and enhancing circularity, as well as set standards for claims on material usage.

The new EU proposal does also include rules aimed at addressing the illegal export of textile waste to other countries, ensuring that shipment will only take place with guarantees in place that the waste will be managed in an environmentally sound manner.⁶ However, concerns over whether the new legislation will actually be able to help countries outside of Europe have been raised.

Where does clothing end up?

Oxfam reports that at least 70% of textiles donated in Europe and the US ends up in Africa.¹⁰ Clothing donated to charity shops from countries including the UK, US and China are sold on to exporters and importers who continue the chain by selling them on to vendors in markets such as Kantamanto in Ghana. According to the Or Foundation, that funds social impact projects in Africa, around 40% of the clothing in Kantamanto leaves as waste.¹¹ While some is disposed of by waste management services, other pieces are burned near the market, sending pollution from unnatural fabrics into the air. The rest



Figure 2. A woman looking at second-hand clothes in the Atacama Desert, Chile. (Photo Credit: Martin Bernetti / AFP)

is discarded in informal landfills. Places including the Atacama Desert in Chile (Figure 2) and the African nations of Ghana and Kenya are currently bearing the burden of a significant portion of the world's textile waste.

The Atacama Desert, in Chile, has earned the unfortunate nickname of the "world's dumpster" due to reports of approximately 741 acres of abandoned garments found there.¹² The enormous volume of used clothing and discarded

textiles has overwhelmed landfills, resulting in soil and water contamination, and causing environmental degradation and ecosystem harm. Uganda has recently adopted a decisive stance by halting the import of second-hand clothing.¹⁰ This move, combined with the EU Strategy, should encourage nations to focus more on addressing textile waste.

¹⁰ Sylvana Lijbaart, 2023. *Uganda bans the import of discarded clothing from Europe and the US*. Available at: <https://fashionunited.uk/news/business/uganda-bans-the-import-of-discarded-clothing-from-europe-and-the-us/2023082871267> [Last accessed September 2023].

¹¹ Sarah Johnson, 2023. *It's like a death pit: how Ghana became fast fashion's dumping ground*. Available at: <https://www.theguardian.com/global-development/2023/jun/05/yvette-yaa-konadu-tetteh-how-ghana-became-fast-fashion-dumping-ground> [Last accessed September 2023].

¹² Bianca Padró Ocasio, 2023. *Remember Chile's Infamous Clothing Dump? This Is What It Looks Like Now*. Available at: <https://www.refinery29.com/en-us/2023/04/11360411/chile-fast-fashion-dumping-atacama-desert-now> [Last accessed September 2023].

The challenges of innovation

Whilst the proposals from the European Union are certainly a move in the right direction, it is clear they do not go far enough to put an end to the era of fast fashion once and for all. Ideally, consumers will need to distance themselves from the societal pressure of fast fashion and make more sustainable choices. Shoppers need also to understand that fast fashion is not as affordable as it first appears. Whereas it may not represent a profitable choice for those engaged in its production, or for our environment, it also reveals itself as a less economical option for consumers over time: it often exceeds the price of durable second-hand clothing, and, more importantly, the incessant cycle of acquiring and replacing short-lived items can eventually lead to considerable costs. Undeniably, increased consumption drives the production of cheap, non-durable clothing; however, consumers can not be blamed alone since overproduction equally contributes to the issue. Regulations should be implemented to compel fashion brands to acknowledge their responsibilities and curtail overproduction. The EPR proposals, which would make retailers financially responsible for the management of the end-of-life of their garments, have the potential to make an impact on fast fashion; should the associated fees be substantial, this could incentivise brands to produce less.

Material innovation companies are also facing challenges: earlier this year, Bolt Threads, the start-up backed by high profile players such as Stella McCartney, Adidas, and Kering, announced a pause in its operations. The \$300 million in investments was still not enough to scale up their innovation, the leather alternative, mycelium-based, Mylo.

Increasing global interest in sustainability and environmentally friendly products has not translated into easy funding during this critical period. Despite the vital role sustainable materials play in addressing climate change, doubts persist about their long-term viability and scalability. Consequently, many investments are redirected towards more lucrative or less risky areas, such as artificial intelligence (AI).¹³ Another obstacle to scaling innovative bio-based materials is consumer willingness to purchase them – do the environmental advantages justify the additional cost? Irrespective of the answer, given the prevailing economic conditions, it is unrealistic to anticipate that everyone can afford it.

Scaling innovative materials like Mylo ultimately pivots on a supportive regulatory environment. One that incentivizes and rewards sustainable practices, penalizes environmental damage, and facilitates the adoption of disruptive technologies. As mentioned above, the new proposals from the EU encourage companies to take responsibility for their products, which should support the uptake of innovative materials going forward.

Despite the challenges, R&D in fashion innovation remains active, with new projects emerging regularly: from cellulose-derived lyocell obtained from CO₂ by Rubi Laboratories, backed by well-known brands like Ganni, Reformation, and Patagonia^{14,15}, to the leather-like material made from beer by Arda Biomaterials, which recently secured a £1.1 million investment from the Clean Growth Fund¹⁶. Another noteworthy innovation – a new technology concept designed to facilitate scaling textile waste-based fibre – was recently introduced by Spinnova, the sustainable textile material company, and Renewcell,

¹³ Haus von Eden, 2023. *Mylo production stop: Is scalability of innovation the Achilles' heel of the fashion industry?* Available at: <https://www.hausvoneden.com/sustainable-business/scalability/> [Last accessed September 2023].

¹⁴ Rubi Laboratories. *Biomimicry for manufacturing in the symbiotic era.* Available at: <https://www.rubi.earth/technology> [Last accessed September 2023].

¹⁵ Danielle Wightman-Stone, 2023. *Ganni and Rubi debut carbon-made yarn.* Available at: <https://fashionunited.uk/news/fashion/ganni-and-rubi-debut-carbon-made-yarn/2023062870243> [Last accessed September 2023].

¹⁶ Simone Preuss, 2023. *Cheers! Start-up secures 1.1 million pounds for leather-like material made from beer.* Available at: <https://fashionunited.uk/news/business/cheers-start-up-secures-1-1-million-pounds-for-leather-like-material-made-from-beer/2023062070103> [Last accessed September 2023].

the Swedish textile-to-textile recycling company. Using a patented process, Renewcell plans to recycle cellulosic-rich textile waste such as cotton and viscose, transforming it into a pulp product called CIRCULOSE®. This biodegradable raw material is produced from 100% recycled textiles and can be used to create new fibre, without the use of harmful chemicals.¹⁷

Stitching a sustainable future

The need to shift towards a circular economy, where textiles are more durable, products are refurbished, and waste is minimised, is clear. A crucial point is the importance of product design and material selection.

The recently introduced proposals that follow the EU Strategy for Sustainable and Circular Textiles, such as textile recycling, product reuse, eco-labelling, and extended producer responsibility (EPR) schemes are promising. Moreover, many players from across the textiles sector show commitment to reducing their environmental impact.

However, to create a better future for the fashion industry, collaboration between designers, manufacturers, retailers, and policymakers is fundamental, as well as aligning public opinion with industry actions.

It is also worth noting that using a bio-based fibre does not necessarily reduce the environmental and climate impacts of the resulting product. To ensure genuine sustainability, a thorough life-cycle assessment of materials, bio-based or not, is vital.

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¹⁷ Spinnova, 2023. *Spinnova and Renewcell announce cooperation to scale circular fashion*. Available at: <https://spinnova.com/news/press-releases/spinnova-and-renewcell-announce-cooperation-to-scale-circular-fashion/> [Last accessed September 2023].