European Parliament

Environmental impact of the textile and clothing industry

What consumers need to know

SUMMARY

The amount of clothes bought in the EU per person has increased by 40 % in just a few decades, driven by a fall in prices and the increased speed with which fashion is delivered to consumers. Clothing accounts for between 2 % and 10 % of the environmental impact of EU consumption. This impact is often felt in third countries, as most production takes place abroad. The production of raw materials, spinning them into fibres, weaving fabrics and dyeing require enormous amounts of water and chemicals, including pesticides for growing raw materials such as cotton. Consumer use also has a large environmental footprint due to the water, energy and chemicals used in washing, tumble drying and ironing, as well as to microplastics shed into the environment. Less than half of used clothes are collected for reuse or recycling when they are no longer needed, and only 1 % are recycled into new clothes, since technologies that would enable recycling clothes into virgin fibres are only starting to emerge.

Various ways to address these issues have been proposed, including developing new business models for clothing rental, designing products in a way that would make re-use and recycling easier (circular fashion), convincing consumers to buy fewer clothes of better quality (slow fashion), and generally steering consumer behaviour towards choosing more sustainable options.

In 2018, the EU adopted a circular economy package that will, at the insistence of the European Parliament, for the first time ensure that textiles are collected separately in all Member States, by 2025 at the latest. The European Parliament has for years advocated promoting the use of ecological and sustainable raw materials and the re-use and recycling of clothing.

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Changing the ways European consumers use their clothes

About 5 % of household expenditure in the EU is spent on clothing and footwear, of which about 80 % is spent on clothes and 20 % on footwear. It has been estimated that in 2015 EU citizens bought 6.4 million tonnes of new clothing (12.66 kg per person).[1] According to European Environment Agency (EEA) estimates, between 1996 and 2012, the amount of clothes bought per person in the EU increased by 40 %. At the same time, more than 30 % of clothes in Europeans' wardrobes have not been used for at least a year. Once discarded, over half the garments are not recycled, but end up in mixed household waste and are subsequently sent to incinerators or landfill.[2]

Several trends have contributed to this increase in consumption. One is the fall in the price of garments in the last few decades. According to the same EEA report, between 1996 and 2012 the price of clothing increased by 3 %, but consumer prices in general rose by about 60 %. This meant that, relative to the EU consumer consumption basket, the price of clothing fell by 36 %. At the same time, the share of clothing in household consumption stayed largely the same: it was 5 % in 1995 and 4 % in 2017.

The other significant trend was the rise of **fast fashion**. Epitomised by the multinational retail chains, it relies on mass production, low prices and large volumes of sales. The business model is based on knocking off styles from high-end fashion shows and delivering them in a short time at cheap prices, typically using lower quality materials. Fast fashion constantly offers new styles to buy, as the average number of collections released by European apparel companies per year has gone from two in 2000 to five in 2011, with, for instance, Zara offering 24 new clothing collections each year, and H&M between 12 and 16. This has led to consumers to see cheap clothing items increasingly as perishable goods that are 'nearly disposable', and that are thrown away after wearing them only seven or eight times.[3]

The textile and clothing industry in the EU

According to Euratex, in 2017 the textile and clothing industry in the EU had a turnover of €181 billion and comprised 176 400 companies (mainly SMEs), employing over 1.7 million people. While between 1998 and 2009 the sector lost about half its workers and turnover declined by 28 %, in 2015 it still accounted for a 5 % share of employment and an over 2 % share of value added in total manufacturing in Europe.[4]

The decline in European textiles manufacturing followed the phasing-out of the World Trade Organisation (WTO) textile quotas, which began in the 1990s and ended in 2005. After this liberalisation in the textiles trade, the share of imports in European clothing consumption increased from 33 % in 2004 to 87 % in 2012. Today, the production of textiles and clothing

> ### Textile industry versus clothing industry
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> As noted in the 2017 Commission Staff Working Document (SWD) Sustainable garment value chains through EU development action, the textile industry commonly refers to the production of yarn, textiles and fabrics, while the clothing industry (also referred to as the garment/apparel/fashion industry) refers to the production of garments. The sector also includes other types of textile products, such as household textiles and technical/industrial textiles (for instance, textiles for industrial filters, hygiene products, textiles for the car and medical industry). However, as explained in the Commission's 2012 SWD Where manufacturing meets creativity, the fashion industry can also include shoes, bags, jewellery and other accessories in addition to clothes.

has one of the most complex global value chains, with most products on the internal EU market manufactured outside the EU, often in countries with lower labour and environmental standards.[5] According to the European Commission, in 2015 the main exporters to the EU were China, Bangladesh, Turkey, India, Cambodia and Vietnam. Nevertheless, according to Euratex, the EU textile and clothing sector exported €48 billion worth of products in 2017, making the EU the second largest exporter in the world – the first being China. At the same time, the EU imported textile products worth €112 billion from third countries.

Environmental issues

Environmental impacts of EU consumption of textiles and clothing are difficult to estimate due to their diversity and the fact that they occur around the globe. A 2006 Joint Research Centre (JRC) report estimated that while food and drink, transport and private housing account for 70 to 80 % of the environmental impact of EU consumption, clothing dominates the rest with a contribution of 2 to 10 % depending on the type of impact.[6] A 2017 report by Global Fashion Agenda (GFA), estimated the EU's environmental footprint caused by the consumption of textiles at 4 to 6 %. Going into more detail, the 2017 Pulse of the Fashion Industry report, put together by GFA and the Boston Consulting Group, estimated that in 2015, the global textiles and clothing industry was responsible for the consumption of 79 billion cubic metres of water, 1 715 million tons of CO_2 emissions and 92 million tons of waste. It also estimated that by 2030, under a business-as-usual scenario, these numbers would increase by at least 50 %.

Raw materials

The production of raw materials is responsible for a large share of the environmental impact of the textile and clothing industry, not least from growing crops for natural fibres. **Cotton**, which according to a 2015 report by European Clothing Action Plan (ECAP) accounts for more than 43 % of all fibres used for clothes on the EU market, is considered especially problematic because it requires huge quantities of land, water, fertilisers and pesticides. The environmental impacts of bio cotton can be drastically reduced compared to conventional cotton, as it uses less water and pollutes less.[7] According to a Textile Exchange report, the share of sustainable cotton increased from 6 % in 2012 to 2013 to 19 % in 2016 to 2017.[8]

According to the 2017 Pulse of the Fashion Industry report, natural fibres have the highest environmental impact, with silk having an especially detrimental effect regarding depletion of natural resources and global warming, cotton contributing excessively to water scarcity and wool to greenhouse gas (GHG) emissions. However, the industry is also testing less frequently used natural fibres, such as hemp, flax, linen and nettle, that require less water, fertilisers and pesticides.

Polyester, which is made of fossil fuels and is non-biodegradable, accounted for 16 % of fibres used in clothes according to ECAP. Its main advantages are that, unlike cotton, it has a lower water-footprint, has to be washed at lower temperatures, dries quickly and hardly needs ironing, and it can be recycled into virgin (new) fibres.[9] Recycled polyester, made mainly from plastic bottles, increased its market share from 8 % in 2007 to 14 % in 2017. However, several studies have recently also shown that one load of laundry of polyester clothes (also nylon and acrylic) can discharge 700 000 **microplastic** fibres, which release toxins into the environment and can end up in human food chain. Estimates show that every year approximately half a million tonnes of plastic microfibres from washing clothes end up in the ocean. The industry is currently experimenting with **biobased polyester** (also known as biosythetics), made at least partly from renewable resources such as starches and lipids from corn, sugar cane, beet or plant oils. While the challenge is to find feedstocks that do not compete with food production and that do not require large amounts of water and pesticides.

Manmade cellulosics (MMCs), derived from cellulose made from dissolved wood pulp of trees, make around 9 % of fibres used in clothes on the EU market. Most commonly used is viscose, also known as rayon. They are made from renewable plants and are biodegradable, but the main challenge is also the sustainable sourcing of cellulose, as the global production of MMCs more than doubled from 1990 to 2017. The industry is therefore working with innovative materials that are more sustainable, such as lyocell (also known under brand name of Tencel, made of cellulose from eucalyptus, which grows quickly and requires no irrigation or pesticides), bemberg (also known as cupro, made of cotton linter that cannot be used to spin yarn), and Piñatex (made of pineapple leaves).

Processing and garment production

Spinning raw materials into yarns, weaving them into fabrics and applying finishing techniques such as dyeing or giving the fabrics strength and shine are energy-intensive processes in which large amounts of water and chemicals are used. More than 1 900 chemicals are used in the production of clothing, of which 165 the EU classifies as hazardous to health or the environment. According to the 2017 Pulse of the Fashion Industry report, dyeing can require up to 150 litres of water per kilogram of fabric and, in developing countries, where most of the production takes place and where environmental legislation is not as strict as in the EU, the wastewater is often discharged unfiltered into waterways. The production of garments themselves uses a significant amount of energy for sewing, gluing, welding and seam taping equipment. The cut-offs that are left over after the patterns for the clothes have been cut out are also responsible for about 20 % of the industry's fabric waste.

The JRC 2014 study on the Environmental improvement potential of textiles recommends a number of ways for reducing the environmental impacts of the processing and manufacturing phase, including reducing the consumption of chemicals, replacing them with enzymes,[10] using dye controllers and dyeing machinery that require less water, and water recycling. It also recommends integral knitting, where a whole garment is produced in one piece without the need for cutting and sewing (however, the gains in lifecycle impacts may be offset by the high energy use of the integral knitting machines). Some companies are experimenting with novel dyeing processes, such as using CO_2 as the dyeing medium instead of water (e.g. Dutch company DyeCoo), others are experimenting with different cuts, computer controlled tools for pattern making to use more of the fabric with fewer cut-offs, garments with no or fewer seams, bonding or gluing instead of sewing, etc.

Transport and distribution

Most textile raw materials and final products are imported into the EU, which means long delivery routes. However, according to the Pulse of the Fashion Industry report, this stage accounts for only 2 % of the climate-change impacts of the industry, as most large players have optimised the flow of goods. However, this phase is also characterised by waste generated through packaging, tags, hangers and bags, as well as by a large proportion of products that never reach consumers as the unsold leftovers are thrown away.

Consumer use

This is the phase that the JRC study estimated as having the largest environmental footprint in the lifecycle of clothes, owing to the water, energy and chemicals (primarily detergents) used in washing, tumble drying and ironing, and the microplastics shedding into water. The report therefore concluded that one of the most efficient ways to reduce the environmental impact of clothes is to persuade consumers to make small behavioural changes, such as reducing washing temperature, washing at full load, avoiding tumble-drying, purchasing eco-friendly fibres and donating clothes that are no longer used. Consumers can also lower the environmental impact of their garments by washing their clothes less frequently (and airing them instead) and avoiding unnecessary ironing.

End of life

Reliable and recent data on what happens to clothes once their owners decide to get rid of them are not readily available. Most clothes in the EU seem to be still thrown away and burned in incinerators, or end up in landfill where they release methane.[11] The JRC quoted estimates by the Textile Recycling Association that only between 15 % and 20 % of textiles disposed of were collected for reuse or recycling in 2005.[12] A study by European Clothing Action Plan (ECAP), which focused on six EU Member States, points to large differences between EU countries. It estimates that 11 % of used clothing and household textiles were collected in Italy in 2015 and more than 70 % in Germany

in 2011, noting that there is some uncertainty about these figures as well. It is also unclear what proportion of the clothes collected is reusable and how much non-reusable.[13]

Once clothes are collected, they can either be re-used as second hand clothes, or recycled. Currently, there are issues with both paths. Supply outstrips demand for second-hand clothes in the EU and a large share is exported, partly to East Asian or African countries. This has prompted accusations that cheap second-hand clothes cause the decline of local textile industries and that waste is exported to countries that are unable to deal with it. However, a study conducted for the Nordic Council of Ministers concluded that while used textiles may present a challenge to local textile production the gap is likely to be filled by increased imports of cheap new clothing from Asia. It also concluded that European clothing waste is in fact not exported to third countries.[14]

Recycling also faces a number of issues, meaning that globally, only less than one percent of all materials that are used in clothing is recycled back into clothing.[15] This reflects a lack of technologies for sorting the collected clothing, separating blended fibres (although there are some promising new technologies that are able to separate the most common blend of cotton and polyester, such as Worn Again and Blend Re:wind), separating fibres from chemicals including colour during recycling, and establishing which chemicals were used in the production in the first place (which is one reason why it is easier to recycle factory waste such as cut-outs).

In addition, technologies that would enable clothes to be recycled into virgin fibres are still inadequate. This is why most clothes are **recycled mechanically**; they are cut up and shredded, which means that the fibres are shorter, lower quality and lose 75 % of their value. They are therefore not usually used to manufacturing new clothes, but are rather down-cycled into insulation material, wiping cloths or mattress stuffing. New technologies enable mechanically recycled cotton to be mixed with polyester or manmade cellulosics. Technologies for **chemical recycling** that produce virgin fibres of a high quality are available for polyester and nylon and are slowly becoming available, but are not yet fully economically viable, for cotton and blends.[16]

Possible ways forward

There is a strong push within the industry to make every phase of production more sustainable. According to the 2018 Pulse of the Fashion Industry report, large sports apparel companies and big fashion brands are leading the way in investing in new technologies and ways of doing business, but companies in the mid-price segment are also making big improvements and even fast fashion is becoming more sustainable. There have been warnings that companies that do not change their ways may face the rising cost of materials and may have no resources to work with in the future.[17] However, the task is difficult because, for instance, efforts to reduce environmental impacts may result in higher prices for consumers and convincing consumers to buy fewer clothes could reduce businesses' profits.

Several studies' recommendations[18] include finding a more sustainable fabric mix to reduce the use of conventional cotton, improving technologies for sorting and recycling, making washing and drying more efficient, increasing energy efficiency and the use of renewable energy in technological processes, extending the longevity of clothes and improving sorting and recycling.

Extending longevity of clothes

Estimates show that if the number of times a garment is worn is doubled on average, the GHG emissions would be 44 % lower. Several concepts have been developed in this direction:

- **Slow fashion**. Unlike fast fashion, slow fashion is an attempt to convince consumers to buy fewer clothes of better quality and to keep them for longer. The philosophy includes reliance on trusted supply chains, small-scale production, traditional crafting techniques, using local materials and trans-seasonal garments. It calls for a change in the economic model, towards selling fewer clothes. It is however not supposed to be

simply a marketing stunt to sell even more clothes. As a result it could threaten the economic survival of clothes producers unless consumers are also willing to pay higher prices.

- **Fashion as a service.** New business models could increase the number of wears of particular items by using the principles of the sharing economy. Some brands already offer clothes as a service – leasing their clothes instead of selling them – taking their example from already well-established services of renting wedding and special occasion wear, protective clothes and newer services of renting maternity and baby clothes. Other businesses operate clothes subscription services, where consumers pay a monthly fee to rent a fixed number of garments at a time, enabling them to change their wardrobe frequently without buying new clothes (this already works well with bags and high-end fashion, but increasingly also for everyday clothes).

- **Improved collection for re-use, repair and up-cycling**. Brands like Filippa K. are taking pioneering steps by selling their used clothes in their regular shops to make buying second-hand clothes easier. Others are offering long-term warranties that include offering free repair or replacement of a product, offering repair or instructions for repair, or offering upcycling or instructions for upcycling.

- **Smart and instant fashion**. The 2018 Pulse of the Fashion Industry report suggests that the future could bring instant and smart fashion that would reduce waste dramatically. Smart fashion could bring clothes of the future that may use smart technology to instantly adjust to the wishes of the consumer, by changing colours for example, which would also reduce the need to produce multiple versions of the same garment. Instant fashion could enable on-demand production at point of sale, with the help, for instance, of future and improved 3D printing, which could also bring manufacturing back to the EU. Consumers would be able to get what they want produced locally with no overproduction. Some smaller brands are already avoiding overproduction by producing only what consumers order.

Improved collection and recycling

- **Circular fashion**. Like the circular economy in general, circular fashion seeks to reduce waste to a minimum and keep the materials within the consumption and production loop as long as possible. When clothes are no longer used, they should be either sold as second hand clothes or recycled. For this to be possible, products should be designed to have multiple life cycles, with recyclable materials that are tailored to the intended use,[19] timeless styles and design suitable for disassembly (modular design). Researchers and businesses are testing ways to cut fabrics to produce less waste or require fewer seams to facilitate recycling.

- **Extended producer responsibility (EPR) and in-store collection**. Producers and importers can be made legally responsible for ensuring that used clothes are reused or recycled, with companies either organising their own programmes or contributing financially to an accredited collectively responsible organisation. France is the only EU Member State to have an EPR law for clothes, in place since 2006. Most companies pay the Eco TLC, the only organisation accredited by the public authorities, to organise a collective collection system. Elsewhere, companies such as H&M run voluntary collection schemes and accept used clothes of any brand, regardless of whether they are still usable or not, in their shops in return for a small reward.

Targeting consumers

Efforts to make clothing more sustainable require acceptance by consumers, with possibilities for several courses of action.

- **Raising consumer awareness**. Through campaigns or providing information on sustainability in stores or through tags on clothes it may be possible to educate consumers to buy only what they need and to choose more sustainable options. Research shows that consumers are generally in favour of environmentally responsible fashion, but that this is not necessarily reflected in their actual behaviour. For instance, slow fashion has gained much less traction than the slow food movement. A number of factors drive consumers away from sustainable fashion, including higher prices (although the number of environmentally conscious consumers who are ready to pay more for the sustainable option is on the rise) and the notion that recycled clothes may be of a lower quality and that they are produced in less polished styles, etc.
- **Increased transparency and environmental labelling**. Some companies already provide consumers with information on the environmental footprint of their products, such as CO_2 emissions or water use. Choosing a more sustainable option could be made easier through clear and standardised labelling of environmentally friendly products. The EU already has an EU ecolabel for textiles and clothing (see below).
- **Better washing and drying instructions**. As washing and drying make a large contribution to the environmental impact of clothes, the industry could help by providing consumers with better information on how to reduce this impact, for instance, on care labels. Others offer step-by-step repair and care guidelines on their websites.

EU policy

The circular economy package, adopted in 2018, will for the first time require Member States to ensure that textiles are collected separately. The new Waste Directive requires Member States to set up such schemes at the latest by 2025. It also requires the European Commission to consider, by the end of 2024, whether targets for textile waste re-use and recycling should be introduced as well. The directive also introduces targets for general municipal waste re-use and recycling of 55 % by 2025, 60 % by 2030 and 65 % by 2035. Although not specifically aimed at textiles and clothing, other directives in the circular economy package could also mitigate some of the environmental impacts of textiles and clothes. The Packaging Waste Directive introduces targets for the recycling 60 % of all packaging by 2025 and 70 % by 2030. It also introduces material-specific targets for recycling, for instance, plastics, paper and cardboard packaging. The Landfill Directive requires Member States to reduce the share of municipal waste landfilled to 10 % by 2035.

EU legislation and initiatives focusing directly on textiles and clothes can help consumers make more sustainable decisions. The EU has harmonised legislation on the names of fibres, fibre content in fabrics and names of textile products, with first efforts beginning in 1970s. The currently binding Textile Regulation of 2011 lays down rules for labelling and marking of all textile products, including an obligation to state the full fibre composition of textile products at all stages of industrial processing and commercial distribution, and rules on textile fibre names.

The EU also lays down European standards relating to textiles and clothing.[20] Some of the standards relate to minimum performance requirements for certain types of textile products, and environmental aspects of textile products, so for instance, the European standard CEN/TS 16822:2015 refers to self-declared environmental claims. In addition, the EU ecolabel for clothing and textiles, a voluntary certification programme, establishes ecological criteria guaranteeing limited use of substances harmful to health and environment, reduction in water and air pollution, as well as criteria for extending the lifetime of clothes (resistance to shrinking during washing and drying and colour resistance to perspiration, washing, wet and dry rubbing and light exposure).[21] The EU Green Public Procurement (GPP) criteria for textiles facilitates the inclusion of green requirements in public tender documents. It is a voluntary instrument that Member States and public authorities can implement to the extent to which they themselves wish.[22]

European Parliament position

In its own-initiative resolution on the EU flagship initiative on the garment sector of 27 April 2017, which focused mainly on labour and environment issues in the textile industry in third countries, Parliament called on the Commission to promote the use of ecological and sustainably managed raw materials and the re-use and recycling of garments and textiles within the EU. It called on the EU, the Member States and businesses to increase funding for research and development, including in the field of clothes recycling. It also called for the Commission to propose binding legislation on due diligence obligations for supply chains in the garment sector and stressed the right of consumers to be informed on the sustainability, compliance with human rights and environmental credentials of garment industry products. It had already called for the establishment of a legal obligation of due diligence for EU companies outsourcing production to third countries in its resolution of 29 April 2015 on the second anniversary of the Rana Plaza building collapse.

Parliament advocated strongly for textiles recycling in the 2017 interinstitutional negotiations on the Waste Directive, as part of the circular economy package. It insisted that setting up separate collection of textiles should be made mandatory for Member States by 2020. However, while it succeeded in including the obligation for separate collection in the final version of the directive, during the negotiations with the Council the deadline was put back to 2025.

In its own-initiative resolution of 5 July 2016, Parliament advocated social and environmental standards, human rights and corporate responsibility within the context of its trade diplomacy for all sectors, for example in the negotiations within the World Trade Organisation (WTO), Organisation for Economic Co-operation and Development (OECD) and International Labour Organisation (ILO).

In its previous term, in March 2013, Parliament adopted an own-initiative resolution on sustainability in the global cotton value chain. It welcomed the Better Cotton Initiative (BTI), Cotton Made in Africa, the Global Organic Textile Standard (GOTS) and other multi-stakeholder initiatives aiming to increase the sustainability of the cotton and textiles value chain and urged all stakeholders in the cotton sector to work through the International Cotton Advisory Committee (ICAC) in order to minimise environmental degradation, including water footprints and the use of pesticides and insecticides.

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ENDNOTES

[1] Similarly, in 2014 the Joint Research Centre (JRC) estimated average EU consumption of 9.5 million tonnes of textile products each year, 19 kg per person, including 13.5 kg of clothing.

[2] Trends are similar globally. According to a McKinsey analysis, an average consumer buys 60 % more clothes per year than 15 years ago, but keeps the clothes only half the time.

[3] According to the McKinsey State of Fashion 2018, the increasing speed of fashion has recently also been driven by social media and the need to deliver fashion trends to consumers as fast as possible.

[4] For more recent figures, see Eurostat data.

[5] For more on global value chains in the textile and garment industry, see the EPRS briefing Improving global value chains key for EU trade (2016). For more on the social sustainability of fashion industry, see the EPRS paper EU flagship initiative on the garment sector (2017).

[6] The study looked at contribution to global warming, abiotic depletion (including coal and oil), human toxicity, water pollution, etc.

[7] For more details on the environmental impacts of producing 1000 kg of conventional and organic cotton, see The life cycle assessment of organic cotton fibre - a global average.

[8] Strictly speaking, Textile Exchange 'preferred cotton' also includes types of cotton that are not organic, such as fair trade cotton, as well as types of cotton that prescribe minimum environmental requirements, such as Better Cotton Initiative (BTI) standards, but that do not necessarily reach the organic standard. Currently, the leading companies in terms of volume in 2016 were C&A and H&M. For more, see Textile Exchange Organic Cotton Market Report 2017.

[9] In fact, one of the recommendations of the Pulse of the Fashion Industry report is to reduce the use of conventional cotton by replacing it with polyester. The report states that replacing 30 % of conventional cotton with polyester by 2030 would save 23 billion cubic metres of water annually. Some conventional cotton could be replaced by man-made cellulosics, but, as with polyester, the challenge is to convince consumers that these alternative fibres are as comfortable and good looking as cotton. Until this happens, organic and other types of sustainable cotton are recommended as a viable option.

[10] For more on industrial enzymes see for instance Biovision in textile wet processing industry.

[11] This problem is however recognised by the EU as it set a target ceiling of 10 % of municipal waste to be landfilled by 2035.

[12] The 2017 Pulse of the Fashion Industry report also states that the collection rate stands at around 20 %, but according to the ECAP report, this figure is based on data from 2004 or earlier.

[13] Depending on the Member State, the collection of clothes is organised by municipalities or charities and other civic organisations. Some companies, such as H&M and Marks and Spencer, also operate collection schemes for textiles, both reusable and non-reusable.

[14] The study found that 10 % of the highest quality clothes from Denmark, Finland, Norway and Sweden are resold either in the Nordic countries or in Western Europe, while the rest are exported to other EU countries, mainly in Eastern Europe. There, the clothes are sorted, some are sold and some further exported. About 11 % of usable clothes are exported to India and Pakistan and about 18 % to Africa. The non-usable clothes are either treated in the EU or exported, mainly to Eastern Asia, for mechanical recycling.

[15] According to A new textiles economy: redesigning fashion's future, this includes recycling of factory cut-offs, while the rate of recycling of clothing after consumer use could be below 0.1 %. The report also states that around 2 % of input for clothes production comes from recycled materials, mainly plastic bottles for used for production of recycled polyester.

[16] Cotton can be chemically recycled into man-made cellulosics, for instance into Refibra, Re:newcell, Infinited Fiber or ioncell (the latter uses technology that also enables the recycling of old newspapers into fabrics).

[17] Pulse of the Fashion Industry 2017, published by the Global Fashion Agenda and the Boston Consulting Group, warns that unless fashion brands take decisive action, they could see their profitability levels fall by 3 percentage points by 2030.

[18] See for instance studies by the JRC, the EEA and the Ellen MacArthur Foundation, Pulse of the Fashion Industry 2017 and Pulse of the Fashion Industry 2018.

[19] For instance, the Circular Design Speeds project supports the idea of a 'multi-speed wardrobe' with a mix of short-life and long-life garments, new and second hand, rented or borrowed. The materials would match the purpose of the garment, with short-life clothes made from hyper-recyclable materials (possibly 'paper textiles') and long-life clothes refreshed for instance by design interventions over time.

[20] These are developed through technical body CEN/TC 248 of the European Committee for Standardisation.

[21] For more, see Commission decision 2014/350/EU establishing the ecological criteria for the award of the EU Ecolabel for textile products and the factsheet on the EU Ecolabel for textile products.

[22] For more detail, see the 2017 Commission Staff Working Document EU green public procurement criteria for textiles products and services and the 2017 JRC technical report EU Green Public Procurement (GPP) Criteria for Textile Products and Services.

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