

# Waste Reduction in the Fashion Industry: The Circular Economy Approach

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*The fashion industry has to play an important role in the path towards sustainability and the circular economy. Indeed, the fashion industry is a sector with a high environmental impact; it involves a very long and complicated supply chain, which is associated with large consumption of water and energy, use of chemical substances, water and air pollution, waste production and finally microplastic generation. In particular, textiles and clothing waste has become a huge global concern. Against this background, this paper aims at analysing the existing EU measures that have an impact on the development of sustainable practices and the transition to a circular economy in the fashion industry, with a particular focus on the EU revised legislative framework on waste adopted within the Circular Economy Action Plan of 2015.*

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**Keywords:** circular fashion; textile and clothing waste; EU Waste Framework Directive

## INTRODUCTION

As affirmed on 1 February, 2019 by the president of the UN Economic and Social Council at the Sustainable Fashion Summit “sustainable fashion is key to the achievement of the 2030 Agenda”.

In fact, the fashion industry is certainly a sector with a high environmental and social impact: it involves an extremely long and complicated supply chain, is recognized as one of the most polluting sectors and with the greatest consumption of water, and is often associated with workplace abuses (Fletcher 2014). In recent decades, this impact has been increased mainly by two related factors: the shift of production towards emerging or developing countries with low labour costs and the development of the so-called “fast fashion” phenomenon, that is the demand for “disposable” clothing at low prices.

In just two decades, clothing production has almost doubled, driven by an increase in the number of garments purchased each year by an average consumer,

which is in turn mainly driven by the fast fashion phenomenon, with its low prices and increased number of clothing collections offered per year to consumers. The continuous changes in fashion often mean that a piece of clothing, after being used for one season, is simply thrown away. This has led consumers to buy clothes as if they were candies, to buy more clothes than they need and to treat more and more low-priced garments almost as “disposable” goods that can be thrown away after just seven or eight wears (Remy et al. 2016). This sort of “democratic” vision of fashion has allowed to pay lower and lower prices thanks to increasingly lower costs, so as to render the guarantee of a good quality and an equitable production process unaffordable.

Even if awareness of the environmental impact of fashion is low among the general public, the question of sustainability is increasingly at the centre of public attention and consumers are increasingly demanding products with a low environmental and social impact. In fact, the pressure from consumers and especially of non-governmental organizations (NGOs) and the media has acted and continues to act as a stimulus for the adoption of sustainable behaviour in the fashion sector Gordon and Hill (2015).

Nowadays, there is a strong push within the fashion industry to make every phase of the production more sustainable, with a view to transition to a circular fashion model.

In fact, given the economic, social and environmental impact of the sector, to achieve the UN 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs), it is essential to ensure that economic growth and development are accompanied along the whole garment value chains by social justice, job protection and reduction of environmental impacts through an efficient use of resources and sustainable production and consumption models in the perspective of a circular economy. In this perspective, the European Union is committed to supporting a new sustainable development agenda through its development cooperation, where it is promoting sustainable garment value chains at bilateral, regional and global levels (European Commission 2017).

In particular, in 2017 the European Parliament adopted a resolution on the EU flagship initiative on the garment sector (European Parliament 2017), where it asks the European Commission to strengthen its commitment and in particular to develop a EU legal framework including measures on due diligence obligations for supply chains in the garment sector and measures to strengthen supply chain transparency and traceability.

Furthermore, an initiative called European Clothing Action Plan was launched at the EU level to improve the sustainability of textiles across their life cycle from design to end of use, with a view to implement a circular economy model with particular attention to waste reduction given that textiles waste has become a huge global concern (Moorhouse and Moorhouse 2017). Waste prevention throughout the product life cycle and minimizing waste that ends up in

incinerators or landfills are two key elements for the fashion industry's transition to circular economy.

## **GARMENT VALUE CHAIN AND ITS ENVIRONMENTAL IMPACT**

The fashion industry creates global value chains where the various stages of production take place in different countries; complex chains that are strongly connected to each other and include design, manufacture of materials and fashion products (such as textiles, clothing, footwear, leather and fur products) as well as their distribution and retail sale to final consumers.

This is one of the most complex production models with significant upstream and downstream linkages, where global production processes have become increasingly fragmented into complex supply chains, with a multiplicity of actors, a high use of subcontracting and forms of illegal work. Transparency and traceability throughout the supply chain therefore appear essential in the process of evolution towards more sustainable production and the transition to a circular economy in the fashion sector. Undeniably, the fashion industry has a global impact on the economy and the environment. Indeed, garment value chains are major contributors to the economy in many countries all over the world, especially given that in the last decades a large part of the production has been transferred from Europe and North America to emerging and developing countries such as Bangladesh, Cambodia, China, India, Turkey and Vietnam. On the other hand, this phenomenon—largely determined by the search for cheap labour and the approaching the areas of raw materials supply—has exacerbated the global environmental impact of the fashion industry, which some believe is the second most polluting sector immediately after the oil industry. However, it is not easy to estimate the environmental impacts of the sector given their variety and the fact that they occur all around the world. In fact, environmental impacts vary depending on the products, but in general according to a life cycle analysis it is possible to identify some critical issues. With regards to raw materials, the main problems that have emerged are related to energy, water, soil consumption and to the use of biocides, with regards to natural fibres, and to the consumption of non-renewable resources, to emissions into the atmosphere, to discharges into the waters and generally to CO<sub>2</sub> emissions, with regards to synthetic fibres. For the transformation processes, the problems are related to energy and water consumption, to use of chemicals, to the discharge of pollutants into the environment and to the production of waste and hazardous waste. Significant impacts also occur in the transport and distribution phase, where most textile raw materials and final products are transported from production countries to end markets, with high fuel consumption and significant emissions of greenhouse gases.

However, the consumer use phase is considered to have the largest environmental impact in the life cycle of garments, due to the use of water, energy and chemicals for their maintenance (i.e., washing, tumble drying and ironing) and to the release of microplastics into water. Finally, as mentioned above, much attention needs to be paid to the end of life of the products that are still mainly sent, with some exceptions, to landfills or incineration.

Indeed, currently, once discarded, only 20% of clothing waste is collected for re-use and recycling at a global level (Koszewska 2018), while more than half of the clothes are not re-used or recycled and end up in undifferentiated waste, to then end up in landfills or burned in incinerators. Re-use and recycling also face some issues. For example, in Europe, a large part of second hand clothes are exported to other countries, partly to East Asian or African countries, and this can represent a threat for local textile industries, as well as increase clothing waste in those countries that are unable to deal with it (Sajn 2019). On the other hand, less than 1% of the materials used in clothing are recycled back into clothing, mainly because there is still a lack of adequate technologies for this kind of recycling (Ellen Macarthur Foundation 2017). Finally, one also has to consider the waste derived from overproduction, given that a good part of the clothing produced remains unsold, as well as the waste generated through packaging, tags, hangers and bags.

## **THE EU LEGAL FRAMEWORK**

The legislative and regulatory context is of fundamental importance for the sustainable growth of the fashion industry. The EU institution has adopted several measures applicable to the textile and clothing sector which contribute to the sustainable management of value chains in this sector, even with an impact in third countries involved in such chains. With regard to labelling, it is worth recalling that in 2011, the EU adopted a regulation establishing harmonised provisions on the labelling and marking of textile products in order to eliminate barriers to the internal market in the textile sector and to guarantee consumers adequate information. The EU also introduced the EU Ecolabel, which is a voluntary label applicable to products with a low environmental impact throughout their life cycle, from the extraction of raw material through to production, use and disposal. In order to use the Ecolabel logo, the respect of the Ecolabel requirements must be independently assessed and verified; they concern the use of biocides, water consumption and water discharge, air emissions and the use of hazardous substances. It also covers product safety requirements for the consumer. Currently, twenty-three groups of products/services can apply for the European Ecolabel, among which are footwear and textiles.

In addition, in 2013 the EU Commission adopted a package introducing common methods to measure and communicate the life cycle environmental performance of products and organisations. It is worth noting that the Product Environmental Footprint (PEF) pilot specifically addressed leather, footwear and t-shirts and the Organisation Environmental Footprint (OEF) pilot also addressed the retail sector.

A particularly significant regulation for the sector is the REACH Regulation, which regulates the manufacture, import, marketing and end use of chemicals. The regulation applies to chemicals companies as well as textile manufacturers, tanners and shoemakers, using colorants, auxiliaries, adhesives and other substances needed to transform a raw material into a marketable finished product. Beside this one has to mention the Regulation on biocidal products, which concerns the marketing and use of biocides and respect for its provisions by the fashion sector is necessary if products such as leather or textiles have been added with biocides.

Another legislation to recall is the 2010 Directive on industrial emissions (integrated pollution prevention and control, IPPC), which brings together seven previous legislative acts on industrial emissions and establishes rules to prevent and control pollution in the atmosphere, water and soil and to avoid the production of waste coming from industrial plants. The plants that fall within the scope of application of the Directive can operate only if they are in possession of an authorization, and the EU Commission's conclusions on the best technologies available for each sector are the reference for establishing the conditions of authorization. For the textile sector, the Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques for the Textiles Industry was adopted in 2003 and is currently under review.

Finally, as regards waste more specifically, the main reference in the Europe is the Waste Framework Directive (Directive 2008/98/EC), which sets up a legislative framework for the handling of waste in the European Union, establishing some fundamental principles such as the obligation to handle waste in a way to protect the environment and human health, the principle of the waste hierarchy and, in application of the polluter-pays principle, the requirement that the costs of disposal of waste are borne by the holder of waste, by previous holders or by the producers of the product from which the waste came.

## **CIRCULAR FASHION AND WASTE**

It is increasingly evident that the current linear economy model (take-make-dispose) has substantial limits and does not appear to be able to attain the sustainable development goals that now dominate the agenda of policy-makers at

a global level. Increasing attention is therefore placed on the development of policies that allow a transition to a circular economy model.

As there is a huge number of definitions of circular economy, I would consider as a starting point the definition given by the European Commission's Action Plan for a Circular Economy, where it is explained as an economy "where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimised" (European Commission 2015). In a nutshell, the circular economy model proposes the prolonged use of what is taken from nature, in order to reduce future access to primary resources and reduce waste production (Murray et al. 2017; Winans et al. 2017). It is therefore a multi-dimensional concept, which presents different fields of action: first, the order of priority in waste management, which sees landfill disposal as an extreme ratio; secondly, the enhancement of by-products and the connection of waste with the production and use of new raw materials (end-of-waste); thirdly, the attention to the production phase and the transition to a sustainable bioeconomy model in which the raw materials obtained from renewable sources replace raw materials obtained from non-renewable resources, such as fossil fuels, in order to abandon the model of linear economy "production-use-abandonment". In a simple way it can be said that the circular economy model is "shaped by the 3R (reduce, re-use, recycle) principles that should be applied throughout the whole cycle of production, consumption and return of resources" (Koszewska 2018). The limits of the linear economy model appear clearly in the garment sector, where the need to move to a circular economy model is also highlighted by industry experts and practitioners. In fact, it has been highlighted how the circular economy is one of the strategic areas of innovation for the future development of the textile and clothing sector in Europe and beyond.

In the fashion sector, a circular vision involves promoting the extension of the end of life of textile and clothing products, their recycling and re-use for other production cycles, on the one hand, and the use of ecological and sustainable raw materials, on the other. In other words, circular fashion aims to minimize waste and keep materials within the production and consumption loop as long as possible.

The use of certain raw materials and the re-use and recycling in a circular economy system have the objective of reducing, if not eliminating, waste as the basis for a sustainable fashion system. If the transition to circular economy responds to a logic that is both environmental and economic, achieving the goal of a society of recovery and recycling necessarily requires a framework of legal rules that are certain and uniform, if not globally, at least at European level, in order to ensure adequate consideration of both environmental and economic interests (Backes 2017).

In this perspective, the European Union has developed the above-mentioned Action Plan for a Circular Economy which provides for horizontal and vertical

measures to be taken forward in line with the better regulation principles, including where appropriate an impact assessment (de Römph 2018; Hughes 2017).

In particular, regarding waste, the application of the circular economy principles implies a paradigm shift where waste is increasingly treated as a resource (Masieri 2018). In this perspective, in 2018 the EU institution adopted some legislative measures aimed at adapting the existing legislation to the objectives of the transition to circular economy, which must be implemented in the EU Member States within two years. Since this essay is not dedicated to an in-depth examination of all the innovations introduced at European level, we will limit ourselves to taking into consideration the provisions that directly or indirectly concern the fashion sector.

First of all, as regards the objectives for the transition to circular economy, it can be observed that following the amendments introduced in 2018, the Waste Framework Directive requires for the first time that the Member States set up separate waste collection for textiles, including a deadline for implementation, i.e., 1 January, 2025. This provision falls within the broader perspective of the diffusion of separate collection “In order to avoid waste treatment which locks in resources at the lower levels of the waste hierarchy, increase preparing for re-use and recycling rates, enable high-quality recycling and boost the uptake of quality secondary raw materials”. In particular, with regard to textiles, this appears to be fundamental to ensure that textiles are collected and handled in a correct manner so that their value is maintained through re-use or recycling. In this perspective, it is in fact required that by the end of 2024 the Commission shall consider the setting of preparing for re-use and recycling targets also for textile waste.

In addition, more generally, the Directive introduce targets for the recycling of municipal waste, with a consequent impact on textiles, given that textiles fall under the new definition of “municipal waste”, obviously if they do not derive from productive activities. In particular, 55% of municipal waste will have to be recycled by 2025, 60% by 2030 and 65% by 2035.

At the same time, other provisions of the circular economy package may also have an impact on reducing the environmental impact of textiles and clothing. In particular, the Landfill Directive provides that by 2035 municipal waste disposed of in landfills must be reduced to a maximum of 10% of the total municipal waste, including textile waste. Finally, given the impact of packaging also in the fashion sector, the introduction in the Packaging and Packaging Waste Directive of an overall recycling target of 65% of materials by 2025 and 70% by 2030 is certainly relevant.

Then, in the context of the fashion industry, the definitions of waste, by-product and end-of-waste play a central role.

According to Directive 2008/98/EC “waste” means any substance or object which the holder discards or intends or is required to discard.

The issue of the definition of the concept of waste and of the criteria for identifying the concept of by-product or secondary raw material has been and is the subject of wide debate in all the Member States and is of particular importance for the fashion and textile sector.

It seems appropriate to recall that in the interpretation provided by the European Court of Justice prior to the entry into force of Directive 2008/98/EC, the subjective element, namely the intention of the producer or holder to dispose of the waste, appeared central, but the concept of waste “is not to be understood as excluding substances and objects which are capable of economic reutilization” by third parties and therefore “does not presume that the holder disposing of a substance or an object intends to exclude all economic reutilization of the substance or object by others”. As a consequence, there is no reason to hold that the provisions on waste “apply to goods, materials or raw materials which have an economic value as products regardless of any form of processing and which, as such, are subject to the legislation applicable to those products”. However, according to the Court, the concept of waste had to be interpreted “widely in order to limit its inherent risks and pollution” and therefore “the reasoning applicable to by-products should be confined to situations in which the re-use of the goods, materials or raw materials is not a mere possibility but a certainty, without any further processing prior to re-use and as an integral part of the production process”.

This led to Directive 2008/98/EC, where Articles 5 and 6 introduced specific provisions on by-products and end-of-waste status that show a change of perspective with respect to the concept of waste which is then continued with the circular economy package, where it is stated that it is necessary to ensure that “waste is valued as a resource” and to facilitate “the transition to more sustainable material management”, rather than speaking of simple waste management. With particular regard to by-products, EU legislation currently indicates that “In order to promote sustainable use of resources and industrial symbiosis, Member States [shall] take appropriate measures to facilitate the recognition as a by-product of a substance or an object resulting from a production process the primary aim of which is not the production of that substance or object if the harmonised conditions established at Union level are respected”. The Commission should be empowered to adopt implementing acts in order to establish detailed criteria on the uniform application of the conditions of the by-product status. However, where criteria have not been set at Union level, they can be established by Member States. As regards the aforementioned conditions, it should be noted that they have not been subject to modification and they provide that a substance or object is considered not to be waste, but to be a by-product, if (a) further use of the substance or object is certain;(b) the substance or object can be used directly without any further processing other than normal industrial practice; (c) the substance or object is produced as an integral part of a production process; and (d)



further use is lawful, i.e., the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

With regard to end-of-waste, Article 6 of Directive 2008/98/EC has been almost completely rewritten with the aim of providing “operators in markets for secondary raw materials with more certainty as to the waste or non-waste status of substances or objects and to promote a level playing field”. To this purpose it is important that Member States take appropriate measures to ensure that waste that has undergone a recovery operation is considered to have ceased to be waste if it complies with all the conditions laid down in the new Article 6(1) of Directive 2008/98/EC.

In particular the new Article 6 does not provide anymore that “Certain specified waste” shall cease to be waste when it has undergone a recovery, but considers “waste” which has undergone a recycling or other recovery operation and complies with the conditions specified therein. According to Article 6 waste can be considered to have ceased to be waste if: “(a) the substance or object is to be used for specific purposes; (b) a market or demand exists for such a substance or object; (c) the substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and (d) the use of the substance or object will not lead to overall adverse environmental or human health impacts”.

Where appropriate, the Commission shall establish detailed criteria on the uniform application of the end-of-waste status and according to the Directive (EU) 2018/851 amending Directive 2008/98/EC, specific end-of-waste criteria should be considered at least, inter alia, for textiles. Where criteria have not been set at Union level, Member States may establish detailed criteria to certain types of waste and where criteria have not been set at either Union or national level, a Member State may decide on a case-by-case basis.

In addition, the Commission, besides having the power to develop guidelines for the interpretation of the requirements set out in this Directive, including on the definition of waste, prevention, re-use, preparing for re-use, recovery, recycling and disposal, is requested to develop guidelines on the definitions of municipal waste and backfilling.

In any case, the application of rules on by-products and end-of-waste should be without prejudice to other provisions of Union law, particularly provisions on shipments of waste, legislation on chemicals and legislation concerning the placing on the market of certain products.

Moreover, the new Article 9, which is devoted to the prevention of waste, provides that Member States shall take measures to prevent waste generation which may have an impact on the fashion industry as, inter alia, they shall at least (i) promote and support sustainable production and consumption models; (ii) encourage the design, manufacturing and use of products that are resource-

efficient, durable, repairable and re-usable; (iii) encourage, as appropriate and without prejudice to intellectual property rights, the availability of spare parts, instruction manuals, technical information, or other instruments, equipment or software enabling the repair and re-use of products without compromising their quality and safety; (iv) reduce waste generation in processes related to industrial production and manufacturing, taking into account best available techniques; (v) promote the reduction of the content of hazardous substances in materials and products; (vi) reduce the generation of waste, in particular waste that is not suitable for preparing for re-use or recycling; (vii) identify products that are the main sources of littering, notably in natural and marine environments, and take appropriate measures to prevent and reduce litter from such products. More specifically, according to Article 9 (1)(d) Member States shall also encourage the re-use of products and the setting up of systems promoting repair and re-use activities, including in particular for textile, as well as packaging.

More generally, the Directive establishes, among other things, that Member States should make use of economic instruments and other measures to provide incentives for the application of the waste hierarchy such as those specified in Annex IV of the Directive, which includes several measures that can apply to the textiles and clothing sector, such as charges and restrictions for the landfilling and incineration of waste, ‘Pay-as-you-throw’ schemes for waste producers, sustainable public procurement to encourage better waste management and the use of recycled products and materials, fiscal measures to enhance recycle and re-use, incentives for local authorities to promote waste prevention and intensify separate collection schemes and extended producer responsibility schemes.

### **The Extended Producer Responsibility**

According to the Organisation for Economic Co-operation and Development (OECD) the Extended Producer Responsibility (EPR) is “an environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle”.

The European institutions have turned their attention to this policy tool by introducing it first in Directive 75/442/EEC on waste where Article 15 provided that “In accordance with the ‘polluter pays’ principle, the cost of disposing of waste must be borne by:—the holder who has waste handled by a waste collector or by an undertaking . . . , and/or—the previous holders or the producer of the product from which the waste came”. The EPR was therefore introduced into the legislation of some European countries in order to involve producers in the management of packaging waste, as for example in Germany, also to meet the provisions of Directive 94/62/EC on packaging and packaging waste, although the Directive itself does not impose this policy. Then, the European Union extended the use of this tool to specific waste streams, and finally introduced it in the Waste

Framework Directive 2008/98, that established some principles regarding the implementation of EPR schemes by the Member States.

The 2018 amendment introduces a new definition of “extended producer responsibility scheme” and modifies the material rules by amending Article 8 and inserting a new Article 8a. According to the new definition “extended producer responsibility scheme” means a set of measures taken by Member States to ensure that producers of products bear financial responsibility or financial and organisational responsibility for the management of the waste stage of a product’s life cycle.

The adoption of this type of measures is therefore left to the discretion of the Member States, that now must comply with the provisions of the Directive and in particular with the general minimum requirements set by the new Article 8a, introduced precisely in order to try to harmonize the various existing and future national regulations. Indeed, the new “general minimum requirements should reduce costs and boost performance, as well as ensure a level playing field, including for small and medium-sized enterprises and e-commerce enterprises, and avoid obstacles to the smooth functioning of the internal market. They should also contribute to the incorporation of end-of-life costs into product prices and provide incentives for producers, when designing their products, to take better into account recyclability, reusability, reparability and the presence of hazardous substances”. Particularly for textiles it is interesting that the financial contributions paid by the producer of the product to comply with its extended producer responsibility obligations should also take into account the durability, reparability, re-usability and recyclability of the product.

The EPR therefore accompanies the traditional responsibility of those who, using the product, generate waste or those who hold the waste. In practice, the producers take over the responsibility for the management of the waste stage of a product’s life cycle, including separate collection, sorting and treatment operations, and which can extend to waste prevention and to the reusability and recyclability of products. It is not a liability; it may be a merely financial responsibility or a “financial and organisational responsibility”. Even if the EPR is based on the individual responsibility of the producer, an EPR system can be either an individual scheme when a producer organises its own system, or a collective system when several producers decide to collaborate and thus transfer their responsibility to a specific producer responsibility organisation (PRO), but collective schemes are much more common. PROs potentially exert three main functions, which can be implemented in different ways: financing the collection and treatment of the targeted waste, organising and supervising these activities and managing the corresponding data.

The provision of a system focused on extended producer liability appears to be the logical transposition of the polluter pays principle and the principles underlying the waste hierarchy and, today, is a key tool in the promotion of the

circular economy. More specifically, EPR forms an essential part of efficient waste management and in particular can represent a key tool to implement the requirement of separate collection of textiles that should be achieved by 2025. However, until now France is the only Member State that introduced an EPR system for the textile sector since 2008, while in the rest of EU the experience with separate collection of textiles is rather limited and mostly carried out on individual basis by charities or brand owners. Against this background, it is probable however that the novelties in waste management introduced by the circular economy package, where the EPR plays an essential role, will lead to the introduction of EPR systems for textiles also in other Member States, that will have to comply with the minimum requirements set by Article 8a of Directive 2008/98/EC.

The French EPR system for textiles in operation since 1 January, 2007 is based on the EPR principle codified in Article L. 541-10 of the Code de l'Environnement. On the basis of this principle, in 2006 the French legislator introduced a new Article L. 541-10-3 that established that all natural or legal persons who place on the national market in a professional capacity new clothing textile products, footwear or household linen intended for households are required to contribute to or provide for the recycling and treatment of waste from these products. These subjects are therefore requested to either financially contribute to a collective system or to set up an individual system for the recycling and treatment of these kind of waste. In the system currently in place, the various producers pay a financial contribution to the subject authorized by the Public Administration, Eco TLC, for the management of a collective collection system.

## FINAL REMARKS

As already highlighted as starting point, the fashion industry has to play an important role in the path towards sustainability and circular economy, and circular economy especially is one of the strategic areas of innovation for the future development of the textile and clothing sector in Europe and beyond. In this perspective, given the fact that textiles and clothing waste has become a huge global concern, we have emphasized how the EU circular economy package is opening new scenarios for pre-consumer waste (waste materials or processing waste) and post-consumer waste (textiles or other items) in the garment value chain.

Indeed, besides establishing targets for textile waste for the first time, the EU package includes the use of economic instruments and other measures to provide incentives for the application of the waste hierarchy, such as the extended producer responsibility, and appears to introduce a change in the concept of waste

that is increasingly treated as a resource, with a significant impact on the fashion industry.

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