

Article

Circular Economy and Waste in the Fashion Industry

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Abstract: 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.

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

1. 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”¹.

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)². 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 prices³.

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 consumers⁴. 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

¹ The term sustainability is very broad and covers economic, social and environmental aspects. Here we will refer in particular to environmental sustainability, that concerns all the actions that a company can undertake to reduce environmental impacts, such as use of organic fibres, recycled synthetic fibres or from renewable resources; reduction, re-use and recycling of resources (raw materials, energy, water) necessary at all stages of the product life cycle, from production to consumption; reducing the use of chemicals in the production process and their disposal; reduction of emissions of air pollutants and especially of greenhouse gases (carbon footprint); reduction of waste generation.

² On the environmental impact of the fashion industry see also (Toprak and Anis 2017; Muthu 2014; Luz 2007; Kuik 2004–2005; Slater 2003).

³ More specifically on the impact of fast fashion see (Singh 2017; Anguelov 2016; Zerbo 2016; Li 2014; Turker and Altuntas 2014).

⁴ The average number of collections released by European apparel companies has more than doubled from 2000 to 2011, with some companies offering up to 16 collections, like H&M, or even 24, like Zara (Remy et al. 2016).

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.

2. Garment Value Chain and Its Environmental Impact

The fashion industry creates global value chains⁵ 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 consumers⁶.

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.

⁵ Value chains include “the full range of activities that firms and workers do to bring a product/good or service from its conception to its end use and beyond. This includes activities such as design, production, marketing, distribution and support to the final consumer” (www.globalvaluechains.org/concept-tools).

⁶ In this article fashion, textile and clothing industry will be considered together. However, for sake of clarity it is worth recalling that the textile industry is involved in the production of yarn, textiles and fabrics, thus including also household textiles and industrial textiles; the clothing/apparel/fashion industry more narrowly concerns the production and life cycle of garments; and the fashion industry can also include shoes, bags, jewelleryes and other accessories see (Sajn 2019).

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 industry⁷.

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 world⁸.

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 CO₂ emissions, with regards to for 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 (Koszevska 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 issues⁹. 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.

3. The EU Legal Framework

The legislative and regulatory context is of fundamental importance for the sustainable growth of the fashion industry.

⁷ See the statement by the French Minister of the Environment, Brune Poirson, at the Copenhagen Fashion Summit on 13th of May 2019: “Le secteur est le deuxième secteur industriel le plus polluant au monde. Il faut lui donner une direction”.

⁸ For some estimates see (European Commission Joint Research Center 2016; Global Fashion Agenda 2017a, 2017b; WRAP 2017).

⁹ Recycling of pre-consumption textile materials (originating from waste and overproduction) or post-consumption textile materials (i.e., at the end of life cycle of the product) means any recovery operation by which these materials are inserted in a new production process, subject to adequate preparatory treatments; re-use means instead the operation by which fabrics and garments are used again for the same purpose for which they were conceived, with a consequent extension of the life cycle of the product. See also the definitions of recycling and re-use in Article 3 of Directive 2008/98/EC on waste.

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 information¹⁰. The EU also introduced the EU Ecolabel¹¹, 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 textiles¹².

In addition, in 2013 the EU Commission adopted a package¹³ 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 Regulation¹⁴, 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 products¹⁵, 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 plants¹⁶. 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 review¹⁷.

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

¹⁰ Regulation (EU) No. 1007/2011 on textile fiber names and related labelling and marking of the fiber composition of textile products.

¹¹ Regulation (EC) No. 66/2010 on the EU Ecolabel.

¹² New ecological criteria for the award of the EU Ecolabel for textile products were established in 2014 and for footwear in 2016 (See Commission Decision (EU) 2014/350 establishing the ecological criteria for the award of the EU Ecolabel for textile products; Commission Decision (EU) 2016/1349 establishing the ecological criteria for the award of the EU Ecolabel for footwear).

¹³ The package comprised the Communication COM (2013) 196 final "Building the Single Market for Green Products" and the Recommendation 2013/179/EU on the use of common methods to measure and communicate the life cycle environmental performance of products and organizations.

¹⁴ Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency.

¹⁵ Regulation (EU) No. 528/2012 concerning the making available on the market and use of biocidal products Text with EEA relevance.

¹⁶ Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control).

¹⁷ <https://eippcb.jrc.ec.europa.eu/reference/txt.html>.

European Union¹⁸, 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 hierarchy¹⁹ 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 came²⁰.

4. 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 economy²¹, 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"²². 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" (Koszevska 2018)²³.

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 beyond²⁴.

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.

¹⁸ Directive 2008/98/EC on waste.

¹⁹ The waste hierarchy that apply as a priority order in waste prevention and management legislation and policy is the following: (a) prevention; (b) preparing for re-use; (c) recycling; (d) other recovery, e.g., energy recovery; and (e) disposal.

²⁰ On EU waste law see among others (Van Calster 2015; Fischer 2011; Scotford 2009; Koch and Reese 2005).

²¹ 114 definitions of circular economy were identified and codified already in 2017 (Kirchherr et al. 2017).

²² See whereas 40 of Directive (EU) 2018/851 amending Directive 2008/98/EC: "Fostering a sustainable bio-economy can contribute to decreasing the Union's dependence on imported raw materials. Bio-based recyclable products and compostable bio-degradable products could represent therefore an opportunity to stimulate further research and innovation and to substitute fossil fuel-based feedstock with renewable resources". With regards to bioeconomy it is worth mentioning that the Europe's Bioeconomy Strategy was launched in 2012 and updated in 2018 (European Commission 2018a). However, even though the Bioeconomy Strategy and the Action Plan for a Circular Economy have overlapping objectives and areas of intervention, where sustainability represents the core of both approaches, unfortunately they do not have connected policy agenda.

²³ Actually it should be noted that various R frameworks have been used by scholars and practitioners, among which the 3R framework is the most prominent, while the 4R framework (reduce, re-use, recycle, recover) is at the core of the EU Waste Framework Directive (Kirchherr et al. 2017).

²⁴ See (ETP Fibres Textiles Clothing 2016).

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 2018²⁵, 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, 2025²⁶. 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”²⁷. 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 waste²⁸.

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 2035²⁹.

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 waste³⁰. 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 relevant³¹.

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

²⁵ Directive (EU) 2018/851 amending Directive 2008/98/EC on waste.

²⁶ New Article 11(1), Directive 2008/98/EC.

²⁷ Whereas 41 of Directive (EU) 2018/851 amending Directive 2008/98/EC.

²⁸ New Article 11(6), Directive 2008/98/EC.

²⁹ New Article 11(2), Directive 2008/98/EC.

³⁰ New Article 5(5), Directive 1999/31/EC on the landfill of waste, modified by Directive (EU) 2018/850.

³¹ New Article 6(1), Directive 94/62/EC on packaging and packaging waste, modified by Directive (EU) 2018/852.

According to Directive 2008/98/EC “waste” means any substance or object which the holder discards or intends or is required to discard³².

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 States³³ 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/EC³⁴, 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”³⁵. 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”³⁶. 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”³⁷.

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 package³⁸, 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 management³⁹.

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”⁴⁰. 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;

³² Article 3 n.1, Directive 2008/98/EC.

³³ Most recently in relation to circular economy see (Turunen 2018).

³⁴ See Article 1(1)(a) of Directive 75/442/EEC on waste: “‘waste’ means any substance or object which the holder disposes of or is required to dispose of pursuant to the provisions of national law in force”; and Article 1(1)(a) of Directive 2006/12/EC on waste: “‘waste’ shall mean any substance or object in the categories set out in Annex I which the holder discards or intends or is required to discard”. On the definition of waste before the Directive 2008/98/EC entered into force see among others (de Sadeleer 2005a, 2005b; Krämer 2003; Cheyne 2002; Pike 2002; Purdue and van Rossem 1998).

³⁵ See joined cases C-206/88 and C-207/88, Vesso and Zanetti, [1990] ECR I-1461, paragraphs 7 and 13.

³⁶ See case C-9/00, Palin Granit Oy and Vehmassalon kansanterveystyön kuntayhtymän hallitus, [2002] ECR I-03533, paragraph 35.

³⁷ See case C-9/00 cit., paragraph 36.

³⁸ As underlined by Communication COM (2014) 0398 “Towards a circular economy: A zero waste programme for Europe”, at paragraph 2.1: “Some EU policies and instruments already provide tools and incentives in line with the circular economy model. The waste hierarchy that underlies our waste legislation is leading progressively to adoption of the preferred options of waste prevention, preparation for re-use and recycling, and discourages landfilling”.

³⁹ See whereas 2 of Directive (EU) 2018/851 amending Directive 2008/98/EC.

⁴⁰ Whereas 16 of Directive (EU) 2018/851 amending Directive 2008/98/EC. With regards to legal and theoretical approaches to industrial symbiosis as part of a circular economy see (Steenmans et al. 2017).

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 impacts⁴¹.

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”⁴². 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 recovery⁴³ 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 status⁴⁴ 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 textiles⁴⁵. 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 basis⁴⁶.

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 backfilling⁴⁷.

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 products⁴⁸.

⁴¹ Article 5, Directive 2008/98/EC.

⁴² Whereas 17 of Directive (EU) 2018/851 amending Directive 2008/98/EC.

⁴³ In this perspective the new definition of “material recovery” plays a central role, as it aims at clearly distinguishing energy recovery from all other forms of recovery, including any recovery operation, other than energy recovery and the reprocessing into materials that are to be used as fuels or other means to generate energy. The definition furthermore specifies that it includes, inter alia, preparing for re-use, recycling and backfilling (new Article 3 n. 15a of Directive 2008/98/EC)

⁴⁴ New Article 6(2) of Directive 2008/98/EC. This criteria shall include: “(a) permissible waste input material for the recovery operation; (b) allowed treatment processes and techniques; (c) quality criteria for end-of-waste materials resulting from the recovery operation in line with the applicable product standards, including limit values for pollutants where necessary; (d) requirements for management systems to demonstrate compliance with the end-of-waste criteria, including for quality control and self-monitoring, and accreditation, where appropriate; and (e) a requirement for a statement of conformity”.

⁴⁵ Whereas 18 of Directive (EU) 2018/851 amending Directive 2008/98/EC. It is worth recalling that since 2008, the Joint Research Center (JRC) has collaborated closely with Directorate General (DG) Environment in the implementation of the mechanism of end-of-waste criteria. In this context, the JRC carried out a scientific analysis of different waste streams that are candidates to being considered end-of-waste, including textiles, and developed a methodology for determining end-of-waste criteria, based on a number of case studies. See <https://susproc.jrc.ec.europa.eu/activities/waste/index.html#>.

⁴⁶ New Article 6(3) and (4) of Directive 2008/98/EC. The original Article 6(4) provided that in case of lack of criteria at EU level, Member States may decide case by case whether certain waste has ceased to be waste taking into account the applicable case law, while now the reference to case law has been deleted. See also (Retail Forum for sustainability 2013). In general on end-of-waste regulation see among others (Turunen 2017; Brown 2014).

⁴⁷ New Article 38(2) of Directive 2008/98/EC.

⁴⁸ To this regard see (European Commission 2018b). In addition it is also worth recalling the judgement of the Court of Justice of the European Union (EUCJ) in the case *Lapin elinkeino-, liikenne- ja ympäristökeskuksen liikenne ja infrastruktuuri -vastuualue v Lapin luonnonsuojelupiiri ry* (Case C-358/11), where the Court considered the interaction of Waste Framework Directive and

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”⁴⁹.

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”⁵⁰. 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 streams⁵¹, and finally introduced it in the Waste Framework

REACH Regulation for end-of-waste, affirming that hazardous waste may be returned as secondary raw materials, and that REACH may play an important role in this respect. See also (Alaranta and Turunen 2017).

⁴⁹ In the 1990s, the Organization for Economic Co-operation and Development (OECD) launched a reflection aimed at defining the principle of Extended Producer Responsibility and the conditions for its implementation which led to the publication in 2001 of a Guidance Manual for Governments on Extended Producer Responsibility (OECD, Guidance Manual for Governments on Extended Producer Responsibility, 2001), that was updated in September 2016 (OECD, Extended Producer Responsibility Updated Guidance for Efficient Waste Management, 2016). It seems appropriate to recall that the concept was defined for the first time in the early 1990s by Thomas Lindhqvist: see Thomas Lindhqvist and Karl Lidgren, “Modeller för förlängt producentansvar” (“Models for Extended Producer Responsibility,” in Swedish), 26 October, 1990, published by the Ministry of the Environment in “Från vaggan till graven—sex studier av varors miljöpåverkan” (“From the Cradle to the Grave—six studies of the environmental impact of products,” in Swedish), DC 1991:0; in English (. Lindhqvist 1992).

⁵⁰ Directive 75/442/EEC on waste, as modified by Directive 91/156/EEC.

⁵¹ Directive 2000/53/CE on end-of life vehicles, Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators and Directive 2012/19/EU on waste electrical and electronic equipment.

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 8a⁵². 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 cycle⁵³.

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 regulations⁵⁴. 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”⁵⁵. 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 product⁵⁶.

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

⁵² Article 8 of Directive 2008/98/EC provided for the opportunity of introducing the extended producer responsibility, but in a very general manner, thus leaving much discretion to Member States.

⁵³ Article 3(21) of Directive 2008/98/EC.

⁵⁴ It is provided that where extended producer responsibility schemes are established Member States shall: define in a clear way the roles and responsibilities of all relevant actors involved; in line with the waste hierarchy, set waste management targets, aiming to attain at least the quantitative targets relevant for the extended producer responsibility scheme; ensure that a reporting system is in place; ensure equal treatment of producers of products regardless of their origin or size, without placing a disproportionate regulatory burden on producers.

⁵⁵ See whereas 22 of Directive (EU) 2018/851.

⁵⁶ See new Article 8a of Directive 2008/98/EC.

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'Environnement⁵⁷. 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 products⁵⁸. 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 system⁵⁹.

5. 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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⁵⁷ Article L. 541-10 code de l'environnement: “II. En application du principe de responsabilité élargie du producteur, il peut être fait obligation aux producteurs, importateurs et distributeurs de ces produits ou des éléments et matériaux entrant dans leur fabrication de pourvoir ou de contribuer à la prévention et à la gestion des déchets qui en proviennent”.

⁵⁸ Article L. 541-10-3 code de l'environnement: “A compter du 1er janvier 2007, toutes les personnes physiques ou morales qui mettent sur le marché national à titre professionnel des produits textiles d'habillement, des chaussures ou du linge de maison neufs destinés aux ménages sont tenues de contribuer ou de pourvoir au recyclage et au traitement des déchets issus de ces produits”.

⁵⁹ For an analysis of the French EPR system for textiles see ([Billet 2008](#); [Bukhari et al. 2018](#)).

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