Driving a Circular Economy for Textiles through EPR

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Final report

eunomia

Report For

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Executive Summary

Eunomia was commissioned by Changing Markets Foundation and the European Environmental Bureau to conduct a study on the role of Extended Producer Responsibility (EPR) and supporting policy measures in driving a circular economy for textiles in Europe.

In 2020, textile consumption in Europe had on average the fourth highest impact on the environment and climate change from a global life cycle perspective, after food, housing and mobility.[1] Total consumption of clothing, household textiles and footwear amounted to 6.6 million tonnes in 2020 (15kg per person). Textiles are identified as a key value chain in the EU Circular Economy Action Plan published in March 2020, will be addressed in the European Commission's forthcoming Strategy on Sustainable Textiles, and under Article 11(1) of the Waste Framework Directive, Member States are required to set up separate collection for textiles by 2025.

Given the EU's commitment to a 55% reduction in greenhouse gas emissions (relative to 1990) by 2030, the long-term vision of a climate-neutral EU by 2050, and the significant greenhouse gas impacts of EU textile consumption, the forthcoming Textiles Strategy will need to be ambitious.[2]

EPR should be a core component of the Textiles Strategy, as it will be an essential element in the move towards a European Circular Economy for textiles. It is a key mechanism by which the polluter pays principle, enshrined in Article 191(2) of the Treaty on the Functioning of the European Union (TFEU), can be operationalised.[3] Through EPR, end-of-life costs will be borne by producers, rather than, as is typically the case, by municipalities, and by extension, citizens.

Ensuring that producers bear the financial costs associated with end-of-life management of the textiles they sell means that these costs (to the extent that they are passed through) are ultimately visited on consumers in proportion to the extent they consume. With a recent survey identifying 27% of respondents as 'high intensity' consumers of fashion items, it is only fair that those who consume more, pay more.[4] Another way of looking at it is that absence of EPR provides an explicit subsidy to consumption (along with implicit subsidies due to a lack of internalisation of external environmental costs). Given that the challenge with textiles is, at root, one of over-consumption, it is essential that, at the very least, the full end-of-life costs are covered through EPR, and incorporated into the price paid by consumers.

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[1] European Environment Agency (2022) Textiles and the Environment: The Role of Design in Europe's Circular Economy, 10th February 2022, available at: https://www.eea.europa.eu/
[2] Council of the European Union (2021) Climate Change: what the EU is doing, available at: https://www.consilium.europa.eu
[3] OJEU (2012) Consolidated Version of The Treaty on the Functioning of the European Union, Official Journal of the European Union, 26th October 2012, available at: http://eur-lex.europa.eu/
[4] Institute of Positive Fashion (2021) The Circular Fashion Ecosystem: A Blueprint for the Future, 22 September 2021, available at: https://instituteofpositivefashion.com

EPR also holds out the potential to incentivise improved design of textiles (for example to improve durability, or recyclability) through modulating (or varying) the levels of the EPR fees according to relevant criteria. The strength of such an incentive will depend, amongst other things, upon the size of the fee (and any modulation thereof) relative to the sales price (and the margin) of the textile item to which it is applied.

The French EPR scheme for textiles, Re_Fashion, is the only currently operating EPR scheme for textiles in the EU. Fees paid to Re_Fashion by producers only cover, at present, a small proportion of the full end-of-life costs that could potentially be covered by EPR. Full coverage of end-of-life costs would increase the relative size of fees, and the influence of modulation on design choices. However, there will always be some textile items that are less likely to be influenced by such incentives.

Accordingly, we recommend that as a priority, a number of minimum eco-design requirements are introduced alongside EPR, as well as a ban on the use of substances of very high concern (SVHCs) in textile products. These supporting policy instruments will both help to support the effectiveness of EPR schemes, and complement them by addressing issues that might be harder to address through EPR. The priority supporting measures are:

- Banning the use of hazardous chemicals and materials in clothing and textile products
- Implementing minimum eco-design requirements for stress resistance and lifetime of products and components
- Implement minimum eco-design requirements for design practices per product category that allow disassembly for replacement and repair, or for recycling
- Implement minimum repairability and modularity requirements

A number of recommendations are also made as to actions that need to be undertaken at the EU level in order to maximise the effectiveness of EPR in driving positive change through harmonisation of specific aspects, as well as requirements for performance. These are:

- Setting performance targets for the collection and management of used and waste textiles, including repair, collection, preparation for reuse, and recycling (with increasing proportions of closed-loop recycling)
- Establishing an EU-level definition for obligated Producers
- Establishing an EU-level classification for when textiles become waste
- Establishing EU-level classifications for granularity of fee structure and associated reporting obligations
- Establishing EU-level criteria for eco-modulation and associated reporting obligations

Finally, other supporting measures are recommended in order to address the negative impacts of the textiles across the lifecycle, such as the implementation of recycled content targets in textiles (from closed loop recycling), a VAT reduction on repair and limits on microplastics release. Establishing a data reporting and verification system across the value chain for material flows and impacts will provide significant benefit for any targeted regulatory activity and due diligence, and it can be linked to the utilisation of product passports. Supporting measures such as training, communication campaigns, bans on destruction of unsold stock, taxes and standards ought to be considered too.

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Glossary

Term	Definition
CEBM	Circular Economy Business Models
Cellulosics	Semi-synthetic, regenerated fibres made from natural cellulose or cellulose derivatives as the raw material, such as viscose and modal
Clothing	Defined as fibre-based textiles, non-fibre-based synthetics, leather and other skins for the purpose of this report
CAGR	Compound Annual Growth Rate - The mean annual growth rate over a specified period of time longer than one year
ECAP	European Clothing Action Plan - An EU funded project aiming to reduce clothing waste across Europe and embed a circular economy approach
ELV	End-of-Life Vehicle
End-of-life	The stage of the lifecycle where apparel and homeware textiles are no longer wanted and go through a management system to process it for reuse, remanufacturing, recycling or disposal. For example, a management system could be a charity shop or a textile recycling facility.
EPR	Extended Producer Responsibility
Footwear	Defined as fibre-based textiles, leather, and the associated attachments for the purpose of this report
H&S	Health & safety
Household and professional linen	Defined as items such as bed sheets, duvet covers, towels and similar products for the purpose of this report
IPOM	Individual Placed on the Market - The total tonnage of products placed on the market by an individual producer
IPR	Individual Producer Responsibility
LCA	Lifecycle analysis
Natural fibres	Fibres made from plants as the raw material, such as cotton or hemp
OECD	Organisation for Economic Cooperation and Development
PRO	Producer Responsibility Organisation - A collective body which takes charge of meeting the legislative requirements of producers. Once a producer joins a PRO it becomes the entity which is legally responsible to ensure that the legislative targets and requirements of the producer under EPR are fulfilled.

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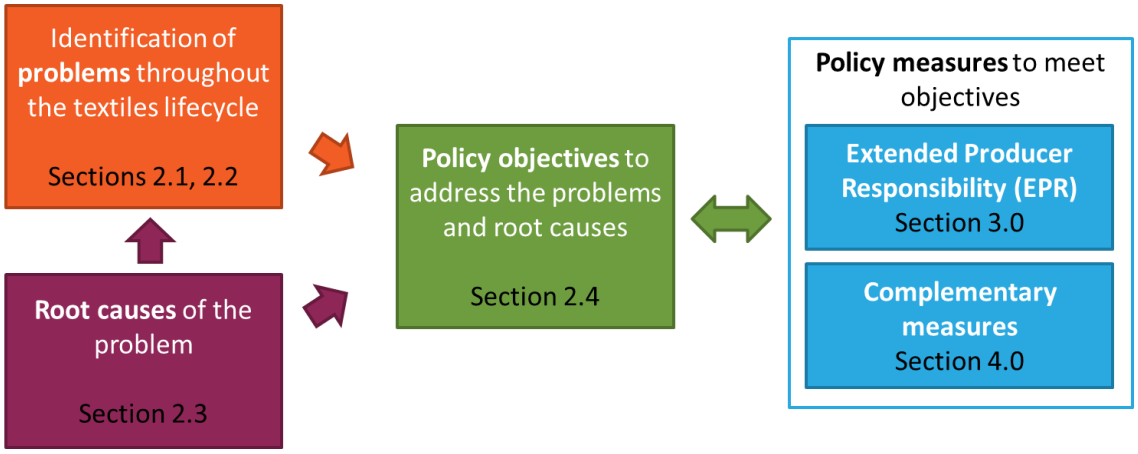
RDF	Refuse Derived Fuel
PFAS	Per- and polyfluoroalkyl substances
REACH	Registration, Evaluation, Authorisation and Restriction of Chemical
RR	Reuse and recycling - the total tonnage of unwanted/waste textiles collected by a Producer and subsequently sold for reuse or recycling
SVHC	Substances of very high concern
Synthetic fibres	Fibres made from the processing of fossil fuels, such as polyester and nylon
Textiles	Textiles encompasses the above definitions of 'clothing', 'footwear' and 'household and professional linen' for the purposes of this report
TLC	Term used by the French Textiles EPR to describe 'textiles', 'household linen' and 'footwear'
TPOM	Total Placed on the Market
Used and Waste Textiles	All textiles that are not new products produced to place on the market. For the avoidance of doubt, this includes product returns, unsold stock, those collected following use, and all textile materials collected and processed by used and waste textile management operators (see definition below), and textiles disposed of through residual waste
Used and Waste Textile Management Operators	Actors functioning within the used and waste textile industry, including both municipal and private collectors, sorters, pre-processors and recyclers.
WEEE	Waste electric and electronic equipment
WFD	Waste Framework Directive
ZSVR	Stiftung Zentrale Stelle Verpackungsregister

1.0 Introduction

Eunomia Research & Consulting Ltd (Eunomia) was commissioned by Changing Markets Foundation (CMF) and the European Environmental Bureau (EEB) to conduct a study on Extended Producer Responsibility (EPR) and supporting measures that would be required to drive a circular economy for textiles in Europe. This study aims to present clear recommendations as to the nature, and combination, of policy instruments that should be implemented in EU Member States.

CMF and EEB have highlighted that the environmental impacts are the main area of interest of this study; thus, the policy measures have been described in more detail where they address environmental issues, and with less detail where they address social and animal welfare issues of the textiles lifecycle. Figure 1-1 below shows how the different sections of the report are connected to derive a clear intervention logic: starting with problems, identifying objectives and ending with policy recommendations.

Figure 1-1 Interplay between the different sections of the report



The report is set out as follows:

- Section 2.0 presents the range of negative impacts associated with textiles production, consumption and end-of-life management, and identifies objectives to be addressed by policy interventions;
- Section 3.0 considers the role, and design, of extended producer responsibility for textiles, and how this might best address the identified objectives. A number of recommendations are made as to how EPR might best be configured, and work alongside supporting policy measures to maximise positive impacts;

- Section 4.0 covers a range of complementary policy measures that enhance the effectiveness of EPR, and/or delivering against objectives that EPR alone is not best placed, or is not intended, to deal with; and
- Section 5.0 presents some concluding remarks.

2.0 Establishing the Problem

2.1 Textiles' Impacts

Environmental and social impacts are present throughout the textile lifecycle, with animal welfare impacts found at the raw material production stage. These impacts can be grouped into several categories, including environmental impacts such as biodiversity/habitat loss, water pollution and GHG emissions, social impacts such as social inequality, modern slavery and human rights abuses and animal welfare impacts such as inadequate and inhumane conditions for animals used in animal textile products. The key impacts are summarised in Table 2-1, which provides an overview of where specific impacts are felt per lifecycle stage.

More details can be found in the appendices: section A 1.0 describes the textiles lifecycle and section A 2.0 describes the environmental, social and animal welfare, and financial impacts across the lifecycle.

Table 2-1 Environmental, Social and Animal Welfare Impacts in the Textile Lifecycle

The impacts are categorised with the 'hand holding a leaf' icon for environmental, the 'heart' icon for social and the 'rabbit' icon for animal welfare impacts.

Impacts	Type	Raw Materials Production	Manufacturing	Distribution & Retail	Consumer Use	End-of-Life
Biodiversity /Habitat Loss & Land Use		Fossil fuel extraction – large land use Natural fibre cultivation & animal fibre, nutrient leaching High resource use Habitat Fragmentation	Resource loss (offcuts, textiles that don't make it to retail)	Resource loss (packaging, deadstock/overstock)	Resource loss (low cost, low durability clothes drives greater production in value chain)	Resource loss (disposal in residual waste, lack of recycling)
Water Consumption & Pollution		Oil spills, acid run-off. Eutrophication from fertiliser, herbicide & pesticide toxicity Crude oil processing – requires "produced" water from groundwater, natural fibre cultivation	Chemical dyeing, finishing & coating etc.		Water pollution (detergent use) Water use (washing)	Water/chemical pollution (washing for reuse)
		Dumping of toxic sludge				
		Impact on human health	Impact on human health (hazardous chemicals)			Impact on human health (hazardous chemicals from reuse/recycling)
Soil Pollution			Microfibre pollution			
		Removal of nutrients				
GHG emissions & Air Pollution		Fossil fuel extraction & processing	Machinery, chemical production & usage, synthetic material processing and transportation	Transportation	Drying, ironing, washing at high temperatures	Collection, sorting, recycling, incineration
		Human health impacts				
Human rights		Inadequate standards of living and working (wages, H&S, modern slavery)				
Social Inequality			Chemicals market monopoly Gender pay gap	Low-income families may only be able to afford cheap clothing (quality and just transition issues)		Textiles waste exports shift cost & impacts to developing countries
		Water/air/soil pollution surrounding factories destroying the health and livelihoods of the local population (e.g., fishing & agriculture)				
		Dependence on latter part of supply (brands driving price paid for products)				
Animal welfare		Inadequate/inhumane conditions for animal textile products (leather, down, exotic skins etc.)				

2.2 Textiles Sales Channels

European consumers buy textiles via **brick-and-mortar or online sales channels**. In the case of brick-and-mortar sales channels, consumers mostly buy textiles from large retailers or retail chains (e.g., department stores), or small retailers, single outlets, and boutiques. In terms of e-commerce, large retailers have created online websites in parallel to their brick-and-mortar stores, in the form of 'brand.com'. Consumers also buy textiles from online marketplaces such as Amazon, offering textiles as one of many product categories. Lastly, textiles are available through online fashion retailers, that only exist online and specialise in offering a variety of brands, such as Zalando. Some of these online fashion retailers have also created their own brands, such as Asos.[5]

Depending on the retailer, brand website, online marketplace, or online fashion retailer, textiles may come from producers outside of Europe, from importers or wholesalers acquiring products from outside Europe, directly from European manufacturers, or a combination thereof.[6]

The key trends in terms of shift to online media are described in Appendix A 3.0 and this section focuses on what is known of the impacts, given the limited research to date on the implications for the environment of these trends. Existing research into the impacts of e-commerce versus brick-and-mortar tends to focus on the **greenhouse gas emissions and other air pollutants** linked to day-to-day running of stores (e.g., lighting and temperature regulation) or transportation (e.g., consumer and employee movements to and from to stores). However, the rise of ecommerce – and the convenience it brings to consumers – is likely contributing to fast fashion and the problematic increase in textiles consumption, thereby exacerbating the environmental, social and animal welfare issues previously identified under Section 2.1.

Online marketplaces help to connect consumers with a wider array of manufacturers and competitive prices. Well-known brands have started to sell on online marketplaces, to retain sales and due to concern over unauthorised sellers; these unauthorised sales of their products affect prices, relationships with consumers, and create reputational risk.[7] Yet, low product costs often found on online marketplaces are usually linked to **poorer quality**,[8] and online marketplaces, like most brands, do not enforce minimum durability standards. Amazon, Wish and

[5]McKinsey & Company (2019) *Online as the key frontline in the European fashion market*, May 2019, https://www.mckinsey.com/pl/~/media/McKinsey/Locations/Europe%20and%20Middle%20East/Polska/Raporty/Moda%20na%20e-commerce/McKinsey-report_Online-as-the-key-frontline-in-the-European-fashion-market.pdf
[6] CBI (2021) *Entering the European Market for Homeware*, Accessed on 14th September 2021, https://www.cbi.eu/market-information/home-decoration-home-textiles/homewear/market-entry
[7] Wilson, A (2020) *Why big brands are selling through online marketplaces*, Accessed 18th November 2021, https://www.savant-events.com/why-big-brands-are-selling-through-online-marketplaces/
[8] Environmental Audit Committee (2019) *Fixing fashion: clothing consumption and sustainability*, February 2019, https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/full-report.html

eBay are three of the biggest online marketplace players, and none of them perform quality checks on items sold via their websites.[9, 10, 11]

Low product costs also impact earlier stages of the supply chain, resulting in **lower profit margins for producers**, which ultimately reduces the already low wages of textile manufacturing workers, often to an unliveable amount. In this way, e-commerce is contributing to the social inequalities referred to in Section 2.1.2 [12]

Convenience-related services such as same or next day deliveries can also have negative consequences. The World Economic Forum estimates that there could be 36% more e-commerce delivery vehicles operating in inner cities by 2030, and consequently, that **emissions linked to the final leg of products' journeys** will increase by 30% in 100 cities globally over the same period.[13]

Free returns have created "serial returners", consumers who regularly buy items but send them back to receive a full refund, with some research suggesting that nearly two out of three online clothes consumers are **"serial returners"**.[14] However, many companies struggle to handle such returns (logistically and/or financially), and returns can easily end up being discarded as waste or being transported elsewhere to be sold again at a reduced price.[15]

With the rise of re-commerce and growing consumer-awareness around sustainability, the fashion industry has made some efforts to support reuse, repair and recycling, in an attempt to mitigate the negative environmental and social impacts of the industry. Some brands are choosing to offer repairs for life, such as Patagonia.[16] Primark, a well-known low-cost brand, announced an increase in its durability standards.[17] However there is a concern that the latter and similar commitments by fast fashion brands are a form of 'greenwashing' as their linear business models are ultimately unsustainable. For example, as part of its sustainability campaign, Primark (amongst other major fashion brands) has begun using recycled plastic bottles in

9 Amazon (2022) Amazon transparency and product quality control program, Accessible at: https://sell.amazon.in/seller-blog/amazon-transparency-and-product-quality-control-program, Accessed 31st January 2022
10 Businesswire (2021) *Wish Announces Bold Steps to Improve Product Quality With a Greater Focus on Discovery Commerce*, Accessible at: https://www.businesswire.com/news/home/20211109006049/en/Wish-Announces-Bold-Steps-to-Improve-Product-Quality-Along-With-a-Greater-Focus-on-Discovery-Commerce/?feedref=JjAwJuNHiystnCoBq_hI-fLcmYSZsqlD_XPbpIM8Ta6D8R-QU5o2AvY8bhI9uvWSD8DYIYv4TIC1g1u0AKcacnnViVjtb72bOP4-4nHK5iej_DoWrIhfD31cAxcB60aE, Accessed on 31st January 2022
11 EBay (2022), *Seller Levels Performance Standard,* Accessible at: https://www.ebay.co.uk/help/selling/seller-levels-performance-standards/seller-levels-performance-standards?id=4080The Big Payoffv, Accessed on 31st January 2022
12 Fashion Roundtable (2021) *Cleaning Up Fashion*, Report for All-Party Parliamentary Group for Ethics and Sustainability in Fashion (ESF APPG), July 2021, https://static1.squarespace.com/static/5a1431a1e5dd5b754be2e0e9/t/60ec3d173ba7d954d567ee0d/1626094876047/FR_ESF_Cleaning+up+Fashion_Report_2021.pdf
13 World Economic Forum (2020) *Online shopping is polluting the planet – but it's not too late*, Accessed 23rd September 2021, https://www.weforum.org/agenda/2020/01/carbon-emissions-online-shopping-solutions/
14 The Guardian (2016) *Returning clothes bought online isn't just easy – it's too easy*, Accessed 23rd September 2021, https://www.theguardian.com/fashion/shortcuts/2016/may/30/customers-return-internet-purchases
15 BBC Earth, *Your brand new returns end up in landfill*, Accessed 23rd September 2021 https://www.bbcearth.com/news/your-brand-new-returns-end-up-in-landfill
16 Patagonia (2021) *Repair Process*, Accessed 18th November 2021, https://help.patagonia.com/s/article/Repair-Process
17 Primark (2021) *Primark pledges to make more sustainable choices affordable for all as it unveils extensive programme of new commitments*, Accessed 18th September 2021, https://corporate.primark.com/en/newsroom/primark-cares/primark-pledges-to-make-more-sustainable-choices-affordable-for-all-as-it-unveils-extensive-programme-of-new-commitments/n/a6a53c03-d486-4ce1-ae55-5795e2b8fa6c

polyester. Yet, polyester from recycled PET is almost never recycled at the end of its life and so is landfilled or incinerated, as opposed to continuing to be recycled as plastic bottles.[18]

2.3 Root Causes of Textiles' Impacts

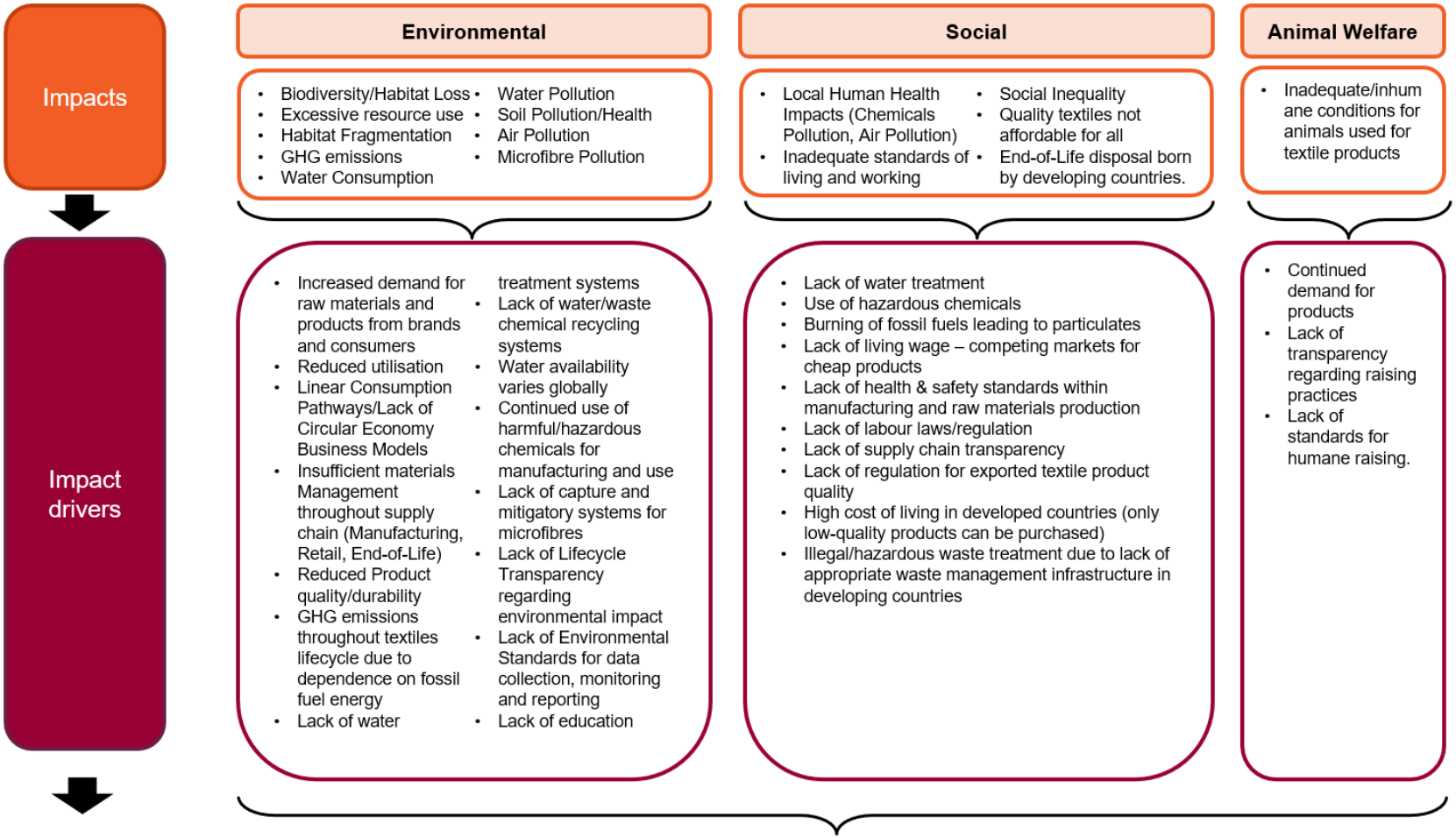
There are many environmental, social and animal welfare impacts throughout the textiles lifecycle, as discussed in Section 2.1. These impacts are a result of root causes that are endemic to the way the textile value chain operates.

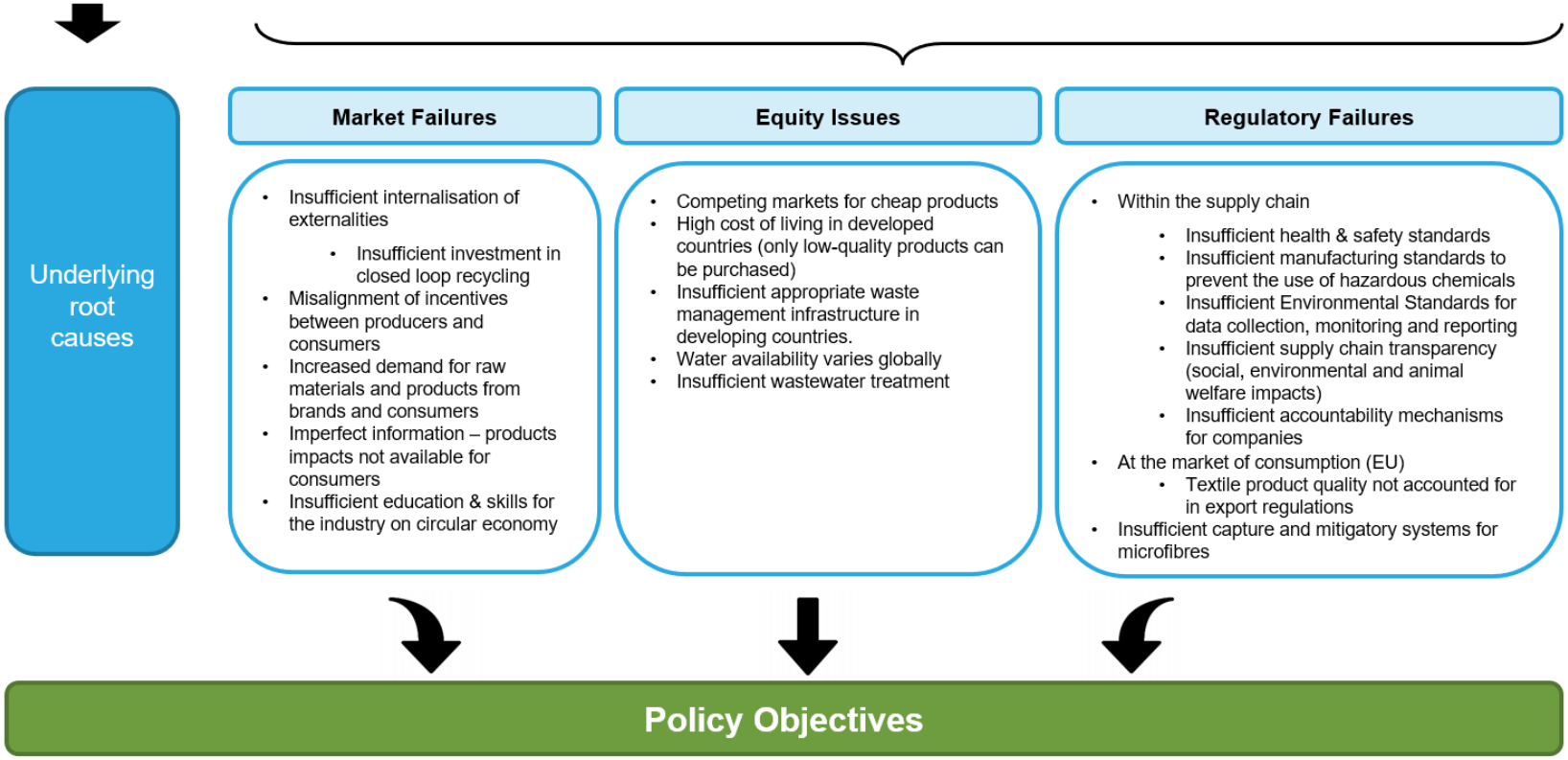
The root causes have been developed from the range of issues the textile value chain faces. In Figure 2-1 (next page), they have been summarised under three broad umbrellas: market failures, equity issues and regulatory failures, in line with the European Commission's Better Regulation guidelines.[19]

[18] Charged Retail Tech News (2021) *Nike, Primark, H&M accused of "greenwashing" as report reveals recycled polyester just as damaging to environment*, Accessed 6th January 2021, https://www.chargedretail.co.uk/2021/10/07/nike-primark-hm-accused-of-greenwashing-as-report-reveals-recycled-polyester-just-as-damaging-to-environment/

[19] European Commission (2019) *Better regulation: guidelines and toolbox*, Accessed 16th November 2021, https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en

Figure 2-1 The Root Causes of the Environmental, Social and Animal Welfare Impacts found in the Textiles Lifecycle




Underlying root causes
Market Failures
Insufficient internalisation of externalities
Insufficient investment in closed loop recycling
Misalignment of incentives between producers and consumers
Increased demand for raw materials and products from brands and consumers
Imperfect information – products impacts not available for consumers
Insufficient education & skills for the industry on circular economy
Equity Issues
Competing markets for cheap products
High cost of living in developed countries (only low-quality products can be purchased)
Insufficient appropriate waste management infrastructure in developing countries.
Water availability varies globally
Insufficient wastewater treatment
Regulatory Failures
Within the supply chain
Insufficient health & safety standards
Insufficient manufacturing standards to prevent the use of hazardous chemicals
Insufficient Environmental Standards for data collection, monitoring and reporting
Insufficient supply chain transparency (social, environmental and animal welfare impacts)
Insufficient accountability mechanisms for companies
At the market of consumption (EU)
Textile product quality not accounted for in export regulations
Insufficient capture and mitigatory systems for microfibres
Policy Objectives

2.4 Textiles Policy Objectives

Objectives for the sector must be formulated to enable a suite of policy measures to be identified that can effectively address all aspects of the root causes identified as part of section 2.3. The following objectives and sub-objectives have been identified.

Objective 1: Reducing the global environmental impact of the apparel and textiles industry, throughout the textiles ecosystem (from raw material to disposal), and reducing resource use to within planetary boundaries through:

1. Reducing greenhouse gas emissions
2. Reducing water consumption
3. Reducing the impacts of pollution on land and in water at the source:
    a. Minimising the use of potentially polluting chemicals and ensuring those that are required are not hazardous from an environmental and human health perspective.
    b. Targeting and addressing the sources of air pollution
    c. Addressing both microfibre production and release
4. Maximising material resource efficiency and optimising materials management in the supply chain:
    a. Optimising manufacturing processes to reduce waste
    b. Increasing remanufacturing
    c. Improving the recyclability of apparel and textile products
    d. Increasing the demand for and uptake of recycled content through closed loop systems
5. Reducing EU consumption of new apparel and textile products:
    a. Maximising the potential and actual number of uses of individual apparel and textile products
        i. Improving durability, repairability and longevity
        ii. Increasing reuse
        iii. Reducing individual purchases of new apparel and textile products
    b. Implementing circular economy business models
    c. Addressing the lack of effective communication systems to support consumers in minimising the environmental impact associated with consumption choices, use behaviours and end of life management
6. Improving systems for the management of unwanted apparel and textiles:
    a. Reducing the financial burden on municipalities and used and waste textile management operators for the management of used and waste textiles
    b. Improving availability of collection systems (and associated required infrastructure) to maximise capture of products the user no longer requires or that are waste
    c. Maximising the availability, capacity and efficiency of sorting systems to separate apparel and textiles products in accordance with the waste hierarchy

   d. Maximising the availability and capacity of recycling systems that produce outputs of equivalent quality to virgin materials, where the process is economically viable and reduces environmental impact
   e. Improving the quality of exported apparel and textiles products for resale and reuse
7. Minimising the quantity of apparel and textiles incinerated, landfilled or illegally deposited in the natural environment
8. Maximising transparency within the apparel and textiles value chain to increase understanding of material flows and environmental impacts.

Objective 2: Ensuring the entire global textiles industry operates in a socially just and responsible manner through:

1. Addressing labour practices to ensure human rights are upheld:
   a. Ensuring all labour within the value chain receives a living wage
   b. Prioritising labour health and safety
   c. Addressing the human health impacts associated with the apparel and textiles value chain
2. Supporting the transition to economically and socially beneficial circular economy business models
3. Maximising transparency within the apparel and textiles value chain to increase understanding of social impacts.

Objective 3: Ensuring the textiles supply chain for animal derived products operates in an ethical and conscious manner through:

1. Ensuring animal welfare is the core priority throughout the animal's lifetime
2. Maximising transparency within the apparel and textiles value chain to increase understanding of animal welfare impacts.

While all are important, as requested by Changing Markets and EEB, the focus of this study is predominantly on reducing the global environmental impact of textiles.

In the following sections we seek to identify the appropriate combination of policy mechanisms to meet these objectives. In Section 3.0, we consider how Extended Producer Responsibility for textiles might be designed in order to most effectively address a number of the objectives, and identify where:

a) Objectives might be better achieved through other policy mechanisms; and/or

b) Other policy mechanisms might play a key role in supporting the efficient delivery of EPR objectives.

In Section 4.0 we then identify complementary policy measures, and describe how these might work alongside EPR.

The aim of these steps is to identify a coherent, mutually supportive system of policy measures that will drive circularity for textiles in the EU.

3.0 Extended Producer Responsibility

The implementation and operation of well-designed extended producer responsibility (EPR) schemes for a range of products is a fundamental element in the effective transition towards a circular economy. The concept of EPR was first introduced by Thomas Lindhqvist in 1990 and was originally defined as:[20]

> *"a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to the take-back, recycling and final disposal of the product".*

The OECD defines EPR as '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', noting that EPR policy is characterised by:[21, 22]

1. The shifting of responsibility (physically and/or economically; fully or partially) upstream toward the producer and away from municipalities; and
2. The provision of incentives to producers to take into account environmental considerations when designing their products.

In ensuring that the producer bears the financial costs of end-of-life management, EPR is well aligned with the polluter pays principle, which is enshrined in EU Law. Article 191(2) of the Treaty on the Functioning of the European Union (TFEU) states that:[23]

> *"Union policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles*

[20] Lindhqvist, T (2000) Extended Producer Responsibility in Cleaner Production: Policy Principle to Promote Environmental Improvements of Product Systems, PhD, The International Institute for Industrial Environmental Economics, Lund University.
[21] OECD (2016) Extended Producer Responsibility, Updated Guidance for Efficient Waste Management, OECD Publishing, Paris
[22] OECD, Extended Producer Responsibility, Accessed 10th October 2021, https://www.oecd.org/env/waste/extended-producer-responsibility.htm
[23] OJEU (2012) Consolidated Version of The Treaty on the Functioning of the European Union, Official Journal of the European Union, 26th October 2012, available at http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:12012E/TXT&from=EN

> *that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay."*[24]

Furthermore, in ensuring that the producer bears the financial costs of end-of-life management, prevention at source through design-for-environment should, in principle, be prioritised. Although as noted by the OECD in their review of EPR schemes across the globe, "*the impact of EPR [schemes] on eco-design has been less than originally hoped for*"[25], substantial attempts to focus EPR schemes of this priority have so far been limited.

In this context it is important to recognise that, as explained in Section 2.0, meaningful change in the way, and extent to which, we produce, consume and manage textiles at end of life is needed. Accordingly, EPR should not simply be an exercise in transferring cost, but should be designed to play a key role – in combination with other complementary policy measures – in bringing about the move towards a circular economy for textiles.

3.1 EPR Policy Recommendations

In the sections below we make a series of recommendations as to the way in which EPR for textiles should be designed and implemented across the EU. In doing so we take account of:

- The experience gained through the existing French scheme for textiles, the progress to date of the Swedish and Dutch schemes under development, and the operation of EPR schemes for other waste streams such as packaging;
- Eunomia's 2020 study for DG Environment on recommendations for guidance for extended producer responsibility schemes, which itself drew on detailed stakeholder engagement and reviewed the operations of a significant number of EPR schemes; [26] and
- The distinct challenges presented by textiles both as a product stream and at the end of life.

In terms of language, where reference is made to an EPR scheme, the example given will be of a single scheme in each Member State, industry-owned, and run on a not-for-profit basis. It is recognised that multiple competing schemes already exist for some product categories in some Member States (for example for packaging and WEEE), but reference is made here to a single scheme for two reasons:

1. It is the view of the authors that a single scheme is preferable to competing schemes (as explained in Section 3.1.7)
2. It is more straightforward to explain concepts, that can themselves be quite challenging to convey, without the added complication of having to explain how they would work under a situation where there are multiple competing schemes.

We would also note that there will inevitably be a significant amount of 'learning by doing', and that experience gained through the operation of EPR schemes for textiles, and the associated collection and management of used textiles, will enable shared learning and further refinement of

[24] Emphasis added
[25] OECD (2016) Extended Producer Responsibility, Updated Guidance for Efficient Waste Management, OECD Publishing, Paris
[26] Eunomia (2020), *Study to support preparation of the Commission's guidance for extended producer responsibility schemes*, May 2020, https://op.europa.eu/en/publication-detail/-/publication/08a892b7-9330-11ea-aac4-01aa75ed71a1/language-en

approaches in future years. Accordingly, our recommendations often indicate a suggested 'direction of travel'.

Finally, we would note that given the resources available for this project, and the limited practical experience of EPR for textiles in Europe to date, many questions remain, and we highlight where further work is needed.

3.1.1 The Importance of Harmonisation across Member States

It is recommended that each EU Member State should implement EPR for textiles. While each Member State differs in terms of its current approach to the collection and management of textiles at end of life – and there will remain differences in terms of cost, and in the specific approaches to collection, reflecting differences between and within Member States – certain key elements should be harmonised. Harmonisation of these key elements will ensure clarity for producers selling across multiple Member States, reduce administrative burden in respect of reporting requirements, and increase the effectiveness of fee modulation in driving design changes.

In the sections below we consider a number of the elements that constitute EPR schemes and make a series of recommendations as to where harmonisation is required. Many of these will require action by the European Commission. It is also important to note that Article 8a of the Waste Framework Directive sets general minimum requirements for extended producer responsibility schemes, and these will apply to EPR schemes for textiles, if mandated at EU level.[27]

3.1.2 Producers Obligated

A harmonised definition of a "producer" is crucial to ensure the appropriate entities are obligated across EU Member States, and to ensure consistency in application, maintain a level playing field, and reduce administrative burden. While there is only one EPR scheme in operation (in France), and two in differing stages of development (Sweden and the Netherlands), given the expectation of more EPR schemes being introduced in the coming years, it is important that the Commission intervenes to ensure consistency in terms of obligated producers across the EU.

There are a number of factors to consider in terms of which producers should be obligated.

One line of thinking is that a producer should be defined as the entity that makes the sale to the final consumer, as they could be considered to have the greatest responsibility for driving the (current high levels of) consumption of new textiles. Given the range of routes through which sales to final consumers are made, under this approach the following entities would, as a minimum, be defined as producers:

[27] European Parliament and the Council of the European Union (2018) Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on Waste, 2018/851

- Brands selling products through their own brick and mortar stores;
- Multi-brand retailers selling products through brick-and-mortar stores;
- Brands selling products through their own 'Brand.com' websites or platforms; and
- Multi-brand retailers selling products through 'Retailer.com' websites or platforms.

Following this logic, a key area requiring further clarification would be the role of online sales platforms that facilitate the sale of new textiles, such as Amazon and eBay. The issues that online retail presents for EPR across a range of product groups (including textiles), and ways in which these issues can be addressed to ensure high levels of compliance, are at the time of writing being investigated by Eunomia on behalf of the European Commission. The outcomes of this online retail and EPR study should further inform the definition of a producer for the purpose of textiles EPR schemes in the EU.

Applying the above approach would allow for the possibility that a brand may be directly obligated for a proportion of in-scope textile products that it produces for the EU market (where it sells directly to the final consumer), while a retailer (or many retailers) may be obligated for the remainder.

Looked at another way, given the potential for fee modulation to incentivise design changes, obligated producers should be those in a position to influence changes in product design in response to price as a result of EPR fees (including any modulation). Following this line of thought, brands would appear to be those best placed to be defined as producers. However, one practical issue requiring consideration is the number of entities that an EPR scheme would have to deal with. It's much more efficient for an EPR scheme to have to deal with a small number of large producers (i.e. those placing the greatest amount of textiles on the market), than to deal with a large number of small producers. Therefore, from the perspective of seeking to minimise administrative burden, there will likely have to be an element of compromise from the above positions in order to deliver a workable approach.

A possible approach could therefore be:

- Large brands (i.e. those placing more than a certain tonnage on the EU market each year) are obligated as producers for *all* of their in-scope products (even where these are sold through retailers). This enables fees, and any modulation thereof, to be directly visited on those able to respond directly by changing the design of the item.
- For smaller brands that sell exclusively through larger retailers, the retailer could be obligated. However, in principle, smaller brands should not be prevented from becoming the obligated entity if they want to be, given that they will be best placed to change their design if incentivised to do so.
- There will also be smaller brands that sell some or all of their products directly to consumers, and they should thus be the obligated entity.

Given the range of different routes by which textile products reach final consumers, this is an area where further work will be needed, ideally by the European Commission engaging with stakeholders, in order to determine the most appropriate definition at the EU level. It may well be that, as with many aspects of EPR for textiles, it is better to start off in a simple way (through, for

example, obligating the largest brands), and subsequently 'widening the net' towards full market coverage. While in principle small producers should not avoid their obligation, in practical terms, in order to get schemes up and running it may well be sensible to start off with a focus on larger producers.

3.1.3 Products in Scope

In principle, to ensure that the polluter pays, it makes sense for the widest possible scope of textiles to ultimately be included under EPR. However, to facilitate the establishment of schemes, there may be merit in starting out with a more limited scope of products, and then, as understanding grows, and infrastructure gaps addressed, the scope can be expanded. The suggested groups of products to be covered by EPR requirements is shown under the 'in scope' category in Table 4. It is worth noting that the list of products can and should increase beyond this over time. Suggested clothing items that could be included in future include accessories such as bags and belts etc. Doing so in a gradual way will also allow for staged development of collection, sorting and reprocessing infrastructure. It is not recommended to include items such as mattresses, carpets, duvets or curtains within the scope of an EPR scheme for textiles, given that these have very different end-of-life management requirements. Instead, these would be better addressed through their own dedicated EPR schemes, in a similar fashion to furniture.

Table 3-1 Type of products in scope from the outset

	Clothing	Non-clothing
In scope	Clothing: fibre-based textiles, non-fibre-based synthetics (e.g. PVC products), leather, other skins, etc. Footwear: all materials	Household and professional linen (e.g., bed sheets, duvet covers, towels etc).
Out of scope	Accessories: bags, belts, etc. The reprocessing systems would be very different from the rest of textiles.	Mattresses, carpets, duvets, curtains, etc.

EPR obligations, and thus payment of fees, should arise on the first occasion that a new textile item is placed on the market. If that item is subsequently reused, given that the end-of-life costs have already been paid, and to incentivise the purchase of second-hand textiles, such items should not be obligated for a second time (and the same applies for any subsequent reuse cycles).

This logic is intuitive where items are sold for reuse within an individual Member State. However, if for example, 100% of clothes purchased in Member State A are new clothes, and 50% of these are sold for reuse to consumers in Member State B, where they subsequently become waste, then Member State B will have a lot of textile waste to manage for which EPR fees have not been paid.

In principle, therefore, EPR fees should 'travel' with textiles items destined for reuse in other Member States so that they can contribute to end-of-life costs where they arise (this logic also applies to items sent for reuse outside of the EU, as discussed in the section below 'Other Costs to be Covered'). An alternative would be for consumers of second-hand items purchased from a

different Member State to have to pay EPR fees, although this would mean that fees are paid twice over, and in principle the item may be sold on again to a consumer in a third Member State. Requiring consumers to pay EPR fees on the purchase of second-hand items would also act to discourage reuse, and such fees would not be able to have any influence on the design of the item in question through modulation.

At present, the extent of such movements of second-hand items between specific Member States is unclear, and the magnitude of such flows might be relatively small. However, it could reasonably be expected that flows of second-hand items between Member States increases in future years due to more consumers engaging in reuse.

It is thus recommended that EPR fees should be paid on the first occasion that an item is placed on the EU market. Improved data is key to the development of a circular economy for textiles, and this should include, to the extent possible, data on the destination of items sold for reuse in other Member States. Once the scale of movement of items for reuse becomes clear, consideration should be given as to the question of transferring funds from fees paid in one Member State to cover end-of-life costs incurred in another.

3.1.4 Cost coverage

Article 8a(4) of Directive 2008/98/EC states that:[28]

Member States shall take the necessary measures to ensure that the financial contributions paid by the producer of the product to comply with its extended producer obligations:

(a) cover the following costs for the products that the producer puts on the market in the Member State concerned:

- *costs of separate collection of **waste** and its subsequent transport and treatment, including treatment necessary to meet the Union waste management targets, and costs necessary to meet other targets and objectives as referred to in point (b) of paragraph 1, taking into account the revenues from **re-use**, from sales of secondary raw material from its product and from unclaimed deposit fees*
- *costs of providing adequate information to waste holders in accordance with paragraph 2,*
- *costs of data gathering and reporting in accordance with point (c) of paragraph 1*

In the sections below we refer to 'used and waste textiles' to describe the textiles that are no longer wanted by the original consumer. The reason for this distinction is that reuse of 'used' textiles is not a waste management activity under EU law, while preparation for reuse, recycling etc. are waste management activities.

It's also relevant to point out that there is currently a lack of consistency across Member States as to when a used textile is classified as waste, which is closely related to inconsistency in the boundary applied between reuse and preparation for reuse. For example, kerbside collections of clean, undamaged and reusable textiles in Sweden are not classified as waste, while in the

[28] Emphasis added

Netherlands they are.[29] As an illustration of this grey boundary area, the collection of mixed reusable and recyclable textiles from on-street recycling banks and their subsequent sorting is clearly and consistently a waste management activity and the textiles involved (even those that are ultimately subject to reuse) are 'waste'. The sorting of the reusable fraction constitute preparation for reuse, which is classified as a waste management operation. However, if the same mix of textiles is donated to a local charity shop and subject to 'sorting' in the shop, then the portion that is put out for sale in the shop is much less likely to be classified as waste, even though a sorting process has 'prepared it for reuse'. The recyclable fraction will be sold to a textile merchant and at that point will enter the waste management system, with the material classified as waste. Alternatively, if the charity carries out its sorting of donated textiles at a centralised warehouse, this may or may not be classified as a waste management operation, sometimes even depending on local interpretation of Member State law.

Given the additional regulatory requirements that surround waste management activities, it is recommended that the European Commission considers these definitional boundaries (both in respect of 'waste' and the waste management hierarchy) in its forthcoming review of the Waste Framework Directive, and at least issues guidance as to where the boundary is drawn in respect of used textiles. These issues should be resolved in such a way as to facilitate management of used textiles towards the top of the waste hierarchy by minimising administrative burdens, with such a harmonised approach also seeking to minimise burdens where used textiles move between Member States.

Used and waste textile management

As outlined above, Article 8a(4) states producers should cover the *"costs of separate collection of waste and its subsequent transport and treatment, including treatment necessary to meet the Union waste management **targets**, and costs necessary to meet other **targets** and **objectives** as referred to in point (b) of paragraph 1"*

Paragraph 1 states that:

Where extended producer responsibility schemes are established in accordance with Article 8(1), including pursuant to other legislative acts of the Union, Member States shall:

> *(b) 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 as laid down in this Directive, Directive 94/62/EC, Directive 2000/53/EC, Directive 2006/66/EC and Directive 2012/19/EU of the European Parliament and of the Council (1), and set other quantitative targets and/or qualitative objectives that are considered relevant for the extended producer responsibility scheme;*

The type of costs to be covered by producers will depend, to a large extent, on what the EPR schemes have to achieve. It therefore makes sense to first consider the role of targets.

[29] Danish EPA (2020) *Towards 2025: Separate collection and treatment of textiles in six EU countries*. https://www2.mst.dk/Udgiv/publications/2020/06/978-87-7038-202-1.pdf

Performance Targets

Under Article 11 of the Waste Framework Directive, Member States are required to set up separate collection for textiles by 2025, and guidance from the European Commission on separate collection has been published.[30]

Article 11 of the Directive also requires the European Commission to consider setting targets for preparation for reuse and recycling of textile waste:[31,32]

> *By 31 December 2024, the Commission shall consider the setting of preparing for re-use and recycling targets for construction and demolition waste and its material-specific fractions, **textile waste**, commercial waste, non-hazardous industrial waste and other waste streams, as well as preparing for re-use targets for municipal waste and recycling targets for municipal bio-waste. To that end, the Commission shall submit a report to the European Parliament and to the Council, accompanied, if appropriate, by a legislative proposal.*

Targets for EPR schemes will be essential in order to drive improvements to used and waste textiles management in Member States. Performance targets will also guide the distribution of funds between domestic collection, sorting, recycling, disposal/recovery and international recycling/recovery.

It's not clear whether the European Commission will set targets *only* for preparation for reuse and recycling, or whether targets will also be set at the EU level for rates of separate collection. Depending on what the Commission does, Member States will have to consider, based on their specific situation, whether further targets are needed in order to bring about the required changes in a timely manner.

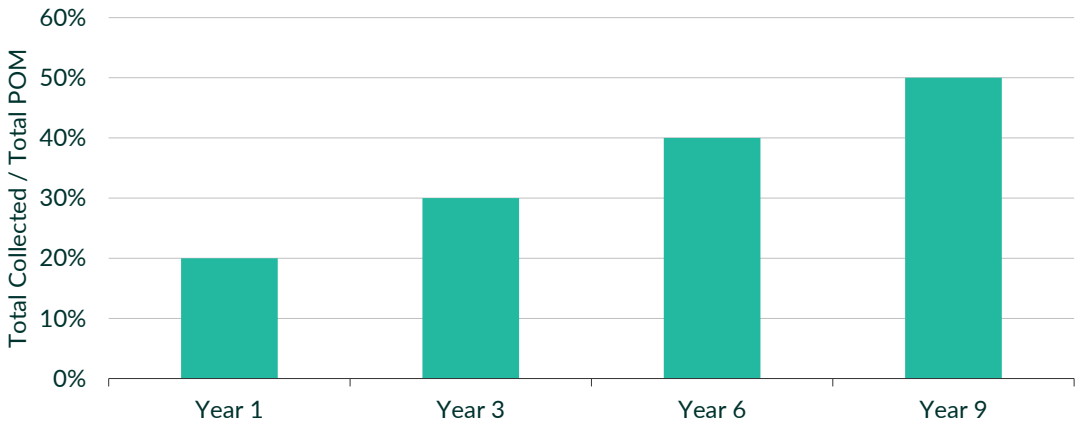
It is not possible within the context of this study to specify the levels at which targets for collection, preparation for reuse and recycling should be set, and the dates at which such targets should be met. Further work will be needed to establish an appropriate trajectory. However, given that separate collection of textiles is essential to achieving high levels of preparation for reuse and recycling, it would seem appropriate to focus from the outset on achieving high collection rates. At the very least this would mean diversion of textile waste from the residual stream, creating the potential for subsequent preparation for reuse and recycling.

Collection targets should be set in a stepwise manner, increasing over time. The targets should be challenging but achievable given the need to establish appropriate processing infrastructure and build up public awareness of the importance of reuse and recycling of textiles to maximise engagement. Clear visibility of increasing levels of collection over time should also enable

[30] European Commission (2020) Guidance for separate collection of municipal waste, 5th December 2020, Available at: https://op.europa.eu/en/publication-detail/-/publication/bb444830-94bf-11ea-aac4-01aa75ed71a1
[31] European Parliament and the Council of the European Union (2018) Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on Waste, 2018/851
[32] Emphasis added

preparation for reuse and recycling facilities to be developed in order take advantage of the increased availability of separately collected textiles (and to contribute towards achieve of preparation for reuse and recycling targets). An illustrative example of step-wise collection targets is shown in Figure 3-1.

Figure 3-1 Example of Step-Wise Collection Targets

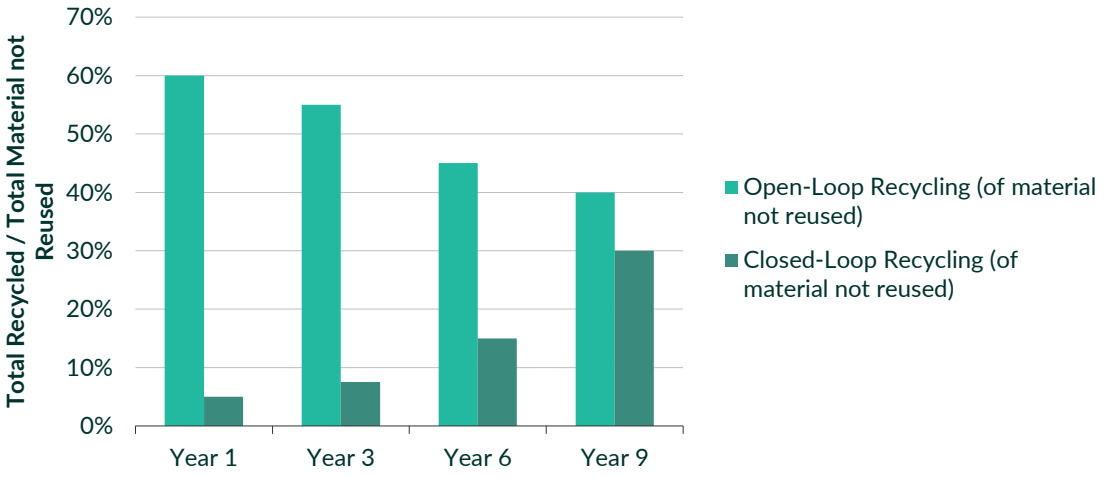


While targets should be achievable, they should ultimately be as ambitious as required to transition to a fully circular economy for textiles. Targets should be reviewed periodically to ensure they remain sufficiently ambitious. This decision will be supported by the comprehensive data on quantities of material managed by schemes, collected through the EPR reporting requirements. Progress will be verified on an annual basis, based on the total quantities of in-scope products placed on the market, and the relevant quantities managed by the EPR scheme.

Importantly, recycling targets should be set as a proportion of the material not reused. This is to avoid material going directly for recycling, which would not be in accordance with the waste hierarchy. The fact that reuse is currently a profitable activity means that there is no real incentive for recycling over reuse at present. However, increased separate collection may mean that the average quality of items collected reduces, lowering the incentive, at the margin, to engage in reuse. Recycling targets could exacerbate this issue and increase risk of competition between reuse and recycling. Accordingly, incentives that might draw material away from reuse should be avoided.

Currently, open-loop recycling (such as the recycling of clothing into rags and insulation) is the principle means through which recycling takes place. This supports a reduction in materials going to disposal and reduces the use of virgin material in these products. However, closed-loop recycling (such as clothing-to-clothing recycling) and associated targets will be required to support a truly circular economy for textiles that maximises the environmental benefits of avoiding primary production. As such, targets should again evolve in a step-wise manner to steadily increase the proportion going to closed-loop recycling. An illustrative example of this is shown in Figure 3-2.

Figure 3-2 Example Open & Closed Loop Recycling Targets



A fundamental technical issue that will need to be resolved before the 'right' recycling targets can be set relates to the calculation point for the numerator in the recycling rate calculation (i.e. the amount of textile waste recycled). This will need to be defined more clearly, as has already been done at EU level in respect of the recycling of packaging materials and some other municipal waste recycling activities. The general principle to be applied, in accordance with Article 11a (c) of the Waste Framework Directive, is that recycling is calculated at the point where the relevant material '*…enters the recycling operation whereby waste materials are actually reprocessed into products, materials or substances'*. Prior to this point, the material must have *'… undergone all necessary checking, sorting and other preliminary operations to remove waste materials that are not targeted by the subsequent reprocessing and to ensure high-quality recycling…'*. As well as ensuring a harmonised rulebook across the single market, the purpose of this principle is to ensure that recycling rates are measured as close to the point where most of the environmental benefits of recycling actually occur (i.e. when new products are made of recycling material, displacing the need for virgin material). This is important because recycling processes often experience significant losses of material between, for example, the point of separate collection and the point where a new product, material or substance is generated and so if measured earlier in the process, a more inflated impression is given regarding the benefits being achieved. Recycling targets should therefore be set in the context of clear rules in this respect, since losses of material before this point that would be excluded from being counted as 'textiles recycled' could be more or less significant depending on where the calculation point is set. In other words, a target that on the face of it looks ambitious may not be if the calculation point is set relatively early in the recycling process (before significant post-collection losses have been incurred). Conversely, a target that looks relatively unambitious could prove to be very challenging if the calculation point is set very late in the recycling process. Given the current immaturity and likely future diversity of textiles recycling technology, it will not be straightforward to set a single calculation point, but however this is resolved, it is important that targets are set with the calculation rules clearly in mind. The most useful parallel here is probably the situation in respect of plastic recycling, where the emergence of chemical recycling technologies (also likely to be directly relevant to textiles recycling), as well as wide-ranging open- and closed-loop mechanical recycling processes have introduced significant complexity into the

calculation project question. Although as yet not fully resolved, the case of plastics recycling calculation is likely to provide much useful thinking when this issue comes to be addressed for textiles.

Finally with respect to recycling targets, consideration should be given to setting different targets for different categories of textiles. A parallel here is packaging, where the Packaging and Packaging Waste Directive includes overall targets for packaging recycling, but also breaks these down into material-specific targets for paper, glass, metal, plastic and wood. These material-based targets vary significantly, for example being much higher for paper, metal and glass than they are for plastic. This reflects both the baseline position when the first material-specific targets were set and the perceived variation in the scale of the challenge in meeting high recycling rates for different materials. In the case of packaging, setting material-specific targets alongside an overall packaging target has helped to drive performance across the board. This both incentivised the 'highly recyclable' packaging materials to continue to make progress and mitigated the risk that Member States and EPR schemes avoid the challenges of plastic recycling because overall targets can be met by focusing on higher bulk density or higher value waste materials such as paper, glass and metals. In the case of textiles, it may well be appropriate to set targets for different product sub-categories. For example, household and professional linen (e.g., bed sheets, duvet covers, towels etc) could be considered more readily recycled than more complex, multi-material products such as apparel and footwear. Equally, some sub-categories within apparel are relatively more readily recycled, but prioritising them for recycling may not be desirable due to their high potential for repair and reuse, with the obvious example here being jeans. By setting recycling targets at a more granular level alongside an overall 'textiles recycling' target, the potential for optimum outcomes can be maximised and risk of unintended consequences minimised, either through the setting of the targets themselves, or the potential for application of different drivers within sub-categories, such as the modulation of EPR fees.

A performance target should also be set for repair, based initially on achieving a minimum level of accessibility in terms of geographical convenience for citizens to access repair facilities. In due course, the target could be refined to include a specific level of repair activity undertaken (on a per capita or per tonne of textiles POM basis). While commercial repair providers already operate, the focus here would be on extending the network of provision to locations that don't already benefit from such services, while increasing capacity and uptake in areas that do, boosting overall levels of repair activity. The costs of meeting these requirements will be covered by the EPR scheme (see Section 'Other Costs to be Covered' below for further information).

Specific Used and Waste Management Costs to be Covered

Given the specified targets, producers will be responsible for covering the costs of collection, sorting, and recycling (whether domestic or taking place outside of the Member State) that are required to deliver a system that ensures the targets are met. Producers should also bear financial responsibility for the fraction that remains in the residual stream.

It's important to note that there are existing commercial companies undertaking the management of unwanted, used and waste textiles, funded through the sale of outputs and so demonstrating

commercial viability for this part of the textiles stream without the need for any further support. As such, producer funding should be focussed on increasing the capacity and optimal function of these commercial operators to collect, sort (for reuse and recycling) and recycle textiles in order to meet targets.[33] Given the expectation that the most valuable items are already being collected, sorted and sold for reuse, the composition and thus value (on a per tonne basis) of additional collected textiles might be expected to reduce over time. It has been highlighted by stakeholders that profits for material, in particular at the sorting stage, are reducing due to the growing proportion of low-quality material collected. This will therefore necessitate increased producer funding to support sorting and so ensure targets are met, as well as strategic market development by the EPR scheme to encourage further end markets and thus boost the value of used and waste textiles.

As well as existing commercial entities, there is a significant not-for-profit presence in the management of used and waste textiles. As a valuable actor within the sector with regards to reuse (and the positive social implications of their action) their function should be further supported and optimised, and care should be taken to ensure their activities are not harmed as a result of the introduction of EPR. It is for this reason that additional financial support be provided through the scheme to non-profits to ensure their continued function, and contribution towards meeting the overall targets, and towards achieving a circular economy for textiles.

Municipalities are likewise involved in management of used and waste textiles, typically in the provision of collection services. Where municipalities currently provide such services, these are ultimately funded by taxpayers/citizens. Under EPR such costs should instead be covered by producers/consumers. Article 8a of the WFD does, however, at paragraph 4, include the important provision that financial contributions paid by producers to comply with their EPR obligations:

> *(c) do not exceed the costs that are necessary to provide waste management services in a cost-efficient way. Such costs shall be established in a transparent way between the actors concerned.*

This means that EPR schemes, and by extension producers, are not obliged to simply pay all of the costs that municipalities incur on such collections. The onus is on municipalities, where they are seeking such costs to be covered, to demonstrate that the costs are not greater than those that would be necessary to deliver the service in a cost-efficient way. Eunomia's 2020 study to support preparation of the European Commission's guidance for extended producer responsibility schemes contains a number of recommendations as to how EPR schemes can ensure that they are paying no more than the 'necessary costs'.[34]

- Collection
  - Producers (through the EPR scheme) will be responsible for funding separate collection of textiles in the Member State in order to meet the relevant targets (be they specific collection

[33] By optimal function we mean, for example, ensuring textiles are collected and sorted in a manner that improves reuse and recycling rates. This could be achieved by mandatory standards for the nature of the collection, e.g. collection banks must be emptied at a minimum frequency to mitigate the impact of contamination.
[34] Eunomia (2020), *Study to support preparation of the Commission's guidance for extended producer responsibility schemes*, May 2020, https://op.europa.eu/en/publication-detail/-/publication/08a892b7-9330-11ea-aac4-01aa75ed71a1/language-en

targets, or simply adequate levels of collection to meet targets on preparation for reuse and recycling. Funding will need to be provided to increase the capacity for, and level of, collection. The extent to which this capacity will need to be increased will likely vary by Member State given differing starting points in terms of existing collection capacity and rates. In some cases, funding will need to be provided to those currently engaged in collection (e.g. the not-for-profit sector, commercial collectors, municipalities) in order for them to enhance their service provision. In some locations, there may be no provision at all for textile collection, and entirely new services will have to be provided. Whatever the nature of the increased service provision, it will be incumbent on the EPR scheme to demonstrate to its members that it is only paying the 'necessary costs'.

- Sorting
  - Producers (through the EPR scheme) will be responsible for covering the costs of increased sorting. Sorting is an important step, especially as collection rates increase, as sorting enables higher quality (and thus more valuable) items to be identified for reuse rather than recycling. Not only is this preferable from an environmental perspective, but given the increased value associated with reuse, this should serve to reduce the net costs of the scheme. It will also help to differentiate those items suitable for being sent to closed-loop recycling.
- Recycling
  - Producers (through the EPR scheme) will have to cover the costs of recycling a sufficient amount of waste textiles to ensure that recycling targets are met. While the market may provide sufficient recycling capacity in due course to meet the targets, there may also be a role for the EPR scheme in making strategic investments to bring forward capacity, especially where new technologies are required. There is a current lack of commercial scale recycling systems for clothing and textile products producing outputs of equivalent quality to virgin materials, to meet the current fibre resource demands of the sector. As such, significant investment will be required to develop this area of waste management to ensure outputs that can displace virgin material in new clothing and textile products, and so create demand for these outputs.
- Recovery (other than recycling) or disposal
  - In line with the polluter pays principle, producers (through the EPR scheme) should bear financial responsibility for the fraction of textile waste that is managed through the residual stream. Composition studies will be needed to determine the amount accounted for by textiles. Where municipalities cover the costs of residual waste management, they will need to be compensated by the EPR scheme for the textile fraction.

Other Costs to be Covered

A range of other costs should be covered by EPR schemes. There are two broad options in terms of determining the magnitude of these costs.

- The first approach would be to set meaningful targets to drive the desired change (e.g. minimum requirements for quality and convenience of repair infrastructure, separate collection targets, preparation for reuse targets, closed loop recycling targets) and then let the EPR scheme determine the magnitude of the costs that will need to be incurred to meet those targets.
- The second, which is arguably less preferred, would be for the EPR scheme to propose a level of expenditure, on R&D for example, and for this to be signed off by Government. However, a weakness of this approach would be that it is not outcome-driven.

The following categories of costs should be covered.

- **Communications** – Cost coverage should include communications to consumers and producers by the EPR scheme or alternative channels funded by EPR schemes. Schemes should also provide a communications platform with an online library of tools and information concerning, for example how exposure to fees for individual producers could be reduced through changes in design, and guidance for used and waste textiles management operators on best-practice and required standards.
  - Communications to consumers would include information focused on facilitating the behavioural changes that will be required of consumers, ranging from communicating the environmental and social impacts of consumption and waste, to opportunities to reduce consumption and increase reuse/repair/recycling and available collection points**.**
  - Communications to Producers would include information concerning the EPR scheme fees, the justification/ rationale for the level at which they are set, and steps they can take in terms of product design to reduce the per-unit fees that they have to pay.

  Communication responsibilities of EPR schemes and cost coverage responsibilities of producers should be considered in the context of the scale of behaviour change likely to be required to bring textiles consumption into line with the EU's carbon neutrality goals from a baseline where most indicators are heading considerably in the wrong direction. Although the path to this objective is not clear with respect to textiles, what does seem clear it is that European consumers and industry will need to have adopted dramatically different behaviours by the 2040's, to an extent perhaps greater than in any other major sector of the EU economy. This is likely to amount to nothing less than a redefinition of what is socially acceptable with respect to textiles consumption and use. It therefore seems likely that behaviour change initiatives beyond those able to be delivered by EPR schemes alone will be required and therefore consideration should be given to the extent to which wider communications and behaviour change initiatives should be deemed within the scope of producer cost coverage obligations.
- **Repair** – Cost coverage should include funding to ensure convenient access to outlets providing repair services. This should, therefore, cover investment in the development of repair services (social enterprise actions, repair hubs, in-store repair services etc.), where deemed necessary, for example in geographical areas that lack them. The funding pot and those receiving funding will be agreed by Strategic Management each year in order to meet the required targets.
- **Research & Development** – Cost coverage should include funding for research and innovation into methods to optimise used and waste textiles management, to ensure that all producers contribute to funding innovation that will be of benefit to all. The funding pot will be proposed by Strategic Management each year, either as a percentage of annual fees, which is currently the approach in France, or as an amount identified as necessary to assist in meeting future targets .[35] Depending on the nature of the R&D challenges to be addressed, and whether they are specific to the Member State, or relate to broader technological innovation, there may be an argument for pooling of such funds (or a proportion of them) across the EU. Costs will cover:
  - Approved R&D projects**;**
  - Monitoring and reporting regarding the projects;
  - Maintaining a library of projects funded; and
  - Sharing of project outputs and other feedback for Producers, including outcomes of the research.
- **International Development Funding for Used and Waste Textiles Management** – There is a strong argument for funding from producers to be utilised to support the development of used textile and textile waste systems in countries that import significant quantities of used textiles from EU Member States. The amount of funding should be based on the total quantity of

[35] In 2020, the French EPR scheme Re_Fashion used ~3.5% of fees collected for Research & Development.

materials exported, and allocation of the funds agreed in conjunction with the relevant ministry (responsible for foreign aid) and trade representatives from countries receiving funding. Due diligence will need to be agreed by the ministry and countries in question to ensure funds are being used appropriately.

- **Administration** – To cover all administration and operational costs of the scheme, such as on-boarding, reporting, managing date, due diligence.

3.1.5 Producer fees

It is recommended that obligated producers should be required to register with the scheme and provide the required information about the amount of specific types of item that they place on the market. However, it should be possible for producers to take some direct responsibility for take-back and management of used and waste textiles, known as Individual Producer Responsibility (IPR). Where producers do so, they are still obligated to take part in the scheme, but will receive a reduction in their fees in accordance with the below fee calculation.

Used and Waste Textile Management Fees – To be paid by Producers, based on the proportion of the total new products placed on the market by each Producer, in the previous financial year. The calculation will utilise:

- The total tonnage of Products Placed on the Market by an individual Producer (IPOM);[36]
- The total tonnage of unwanted/waste textiles collected by a Producer and subsequently reused or recycled in alignment with the waste hierarchy (RR) through Individual Producer Responsibility (IPR);
- The total tonnages of all products placed on the Market in a given financial year (TPOM);
- The total costs of used and waste textile management (collection, sorting, recycling and disposal).

$$\%\ waste\ management\ costs\ paid\ by\ individual\ = \frac{IPOM - RR}{TPOM} \times 100$$

Other costs – Agreed levels of funding for communications, repair, research & development, and international development funding, to be paid by Producers as a proportion of the total tonnage of products placed on the market by an individual Producer. All administrative costs for the scheme shall be paid by Producers as an annual fee. While this could be calculated based on the total costs for administration, divided by the total number of Producers placing products on the Member State Market, there may well be an argument for adjusting the administrative fee, such that it is lower for smaller producers (see recommendations on 'equal treatment' in Eunomia's study to support preparation of the Commission's guidance for extended producer responsibility schemes). [37]

[36] At present producers report to the French EPR scheme the number of products placed on the market of different broad size categories, but no data is gathered as to the actual weight of these items. The actual weight would be a more accurate means of determining relative responsibility for scheme costs, and thus the share of fees to be covered by a particular producer.

[37] Eunomia (2020), *Study to support preparation of the Commission's guidance for extended producer responsibility schemes*, May 2020, available at: https://op.europa.eu/en/publication-detail/-/publication/08a892b7-9330-11ea-aac4-01aa75ed71a1/language-en

3.1.5.1 Fee Structure

The French EPR scheme for textiles has over 70 different 'product lines', i.e. categories for clothing items, with a number of different products listed within each product line. There are four levels of fees, which are based on the size category into which the product lines are placed. These are set on a per item basis, and for clothing, the current fee levels are as follows:[38]

- Very small items (e.g. a child's t-shirt) - €0.006 excluding tax / item
- Small items (e.g. an adult t-shirt) - €0.011 excluding tax / item
- Average items (e.g. a jumper, a child's denim trousers) - €0.021 excluding tax / item
- Large items (e.g. adult men denim trousers, coats) - €0.063 excluding tax / item

There are 14 product lines are categorised as very small items, 15 as small, 26 as average, and 17 as large.

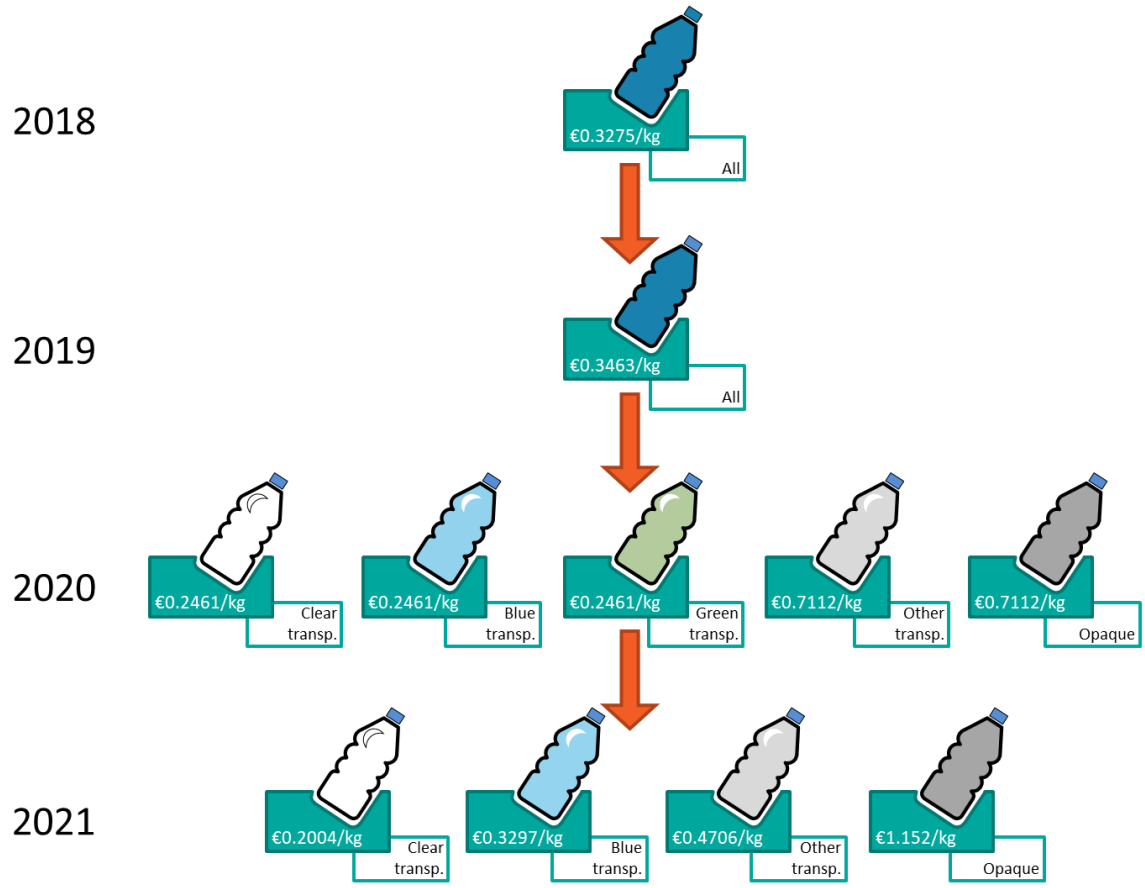
Ideally, the EPR fees paid by producers for products that they place on the market should accurately reflect the full net costs of management of that item at end of life. This is not something that can be identified accurately for each at the outset but should be worked towards over time. This would suggest an increasing granularity of the fee structure, with greater differentiation between different clothing types over time.

A good example of this type of increase in granularity can be found in the Belgian EPR scheme for packaging, Fost Plus, and the changes in fees for PET bottles in recent years, as shown in Figure 3-3.

While in 2018 and 2019 all PET bottles paid the same fee, by 2021 disaggregation into a more granular fee structure allowed for a more accurate representation of end-of-life costs based on the colour and whether the PET bottle is transparent or opaque. This means that 'other' transparent bottles now pay a per kg fee more than twice as high as clear transparent bottles.

[38] Re_fashion (2022) 2022 scale (on 2021 sales), available at: https://refashion.fr/pro/en/fee-calculation-according-quantities-articles-placed-market

Figure 3-3 Evolution of Green Dot rates for PET bottles and flasks (2018-21)



Source: Eunomia

Recently published rates for 2022 indicate that the per kg fee for clear transparent PET bottles will reduce to €0.1039, while that for blue transparent PET bottles will increase to €0.4172, and 'other' transparent bottles will increase to €0.5957, respectively four times and nearly six times more expensive than clear transparent PET bottles.[39]

Fee structures (but not the level of the fees themselves) should be harmonised across all EU Member States. At the same time, the way in which producers report to EPR schemes the type and number of textiles placed on the market should also be harmonised. This will minimise reporting burden for producers that sell across a number of different Member States, and will facilitate future increases in the granularity of the fee structure, and an associated increase in the level of detail that can be provided about specific items. In the absence of harmonisation, there is a risk that producers may have to deal with widely varying reporting requirements and categories across different Member States.

[39] Fostplus (2022) The Green Dot rates, available at https://www.fostplus.be/en/members/green-dot-rates

Not only does a harmonised approach reduce the burden on producers, but it also provides a solid basis for the consistent application of modulation criteria across all Member States, helping to maximise their potential effectiveness in driving positive change.

3.1.5.2 Modulation of Fees

The aim of modulating, or varying, fees is to incentivise producers to make changes in respect of the products they place on the market. The French EPR scheme for textiles includes the following modulation criteria:[40]

- **Durability** – with a 50% bonus of fees per item where certain standards are met (this applies only to certain items)
- **Recycled content** – with a 50% bonus of fees per item where the product contains at least 15% of recycled fibres and/or materials from household textiles (recycled polyester from plastic bottles is excluded).
- **Production waste recycled content** – with a bonus of 25% of fees per item where the item is composed of at least 30% fibres/material from textile production waste

The extent to which such eco-modulation has driven change is unclear. Re_Fashion's 2020 Annual Report notes that in 2020, only 0.7% of items were reported as eligible for a bonus, a reduction from 2.1% of items being reported as eligible in 2019.[41]

If such modulation incentives are, indeed, limited in their effect, then it could well be due to the small size of the fee (and thus the saving arising from reporting eligibility for a bonus) relative to the sales price of the textile products. For example, the fee for an adult t-shirt is €0.011. If the t-shirt retails for €10, then the fee is 0.1% of the sales price. A 25%, or a 50% reduction in the level of the fee may not, therefore, constitute much of an incentive to change design.

This issue, of a low fee: sale price ratio is not unique to the French textiles scheme; it is an issue which has arguably also limited the effectiveness of fee modulation in schemes covering other products, such as batteries and electrical equipment. All else being equal, the greater the size of the EPR fee relative to the price of the product, the larger the influence of any modulation of that fee on design choices. In the case of textiles, the existing French scheme does not cover all the costs associated with end-of-life management, and as cost coverage increases, and performance targets ramp up, the overall costs of the scheme are likely to increase significantly. However, it is always important, when considering the use of modulation, to have in mind how effective it will be in changing behaviour.

Beyond the ratio of EPR fee to sales price, there are other ways in which to maximise the effectiveness of fee modulation. Firstly, the modulation criteria should be harmonised across all Member States. All else being equal, the magnitude of the shift achieved by a certain level of fee modulation will be greater if it is replicated consistently across all Member States. The application of a consistent signal using harmonised criteria will give a much stronger, and indeed clearer,

[40] Re_fashion (2021) The Criteria for Eco-Modulations, available at: https://refashion.fr/pro/en/eco-modulation
[41] Re_fashion (2021) Re_fashion Annual report 2020, available at: https://refashion.fr/pro/sites/default/files/rapport-etude/refashion-annual-report-2020.pdf

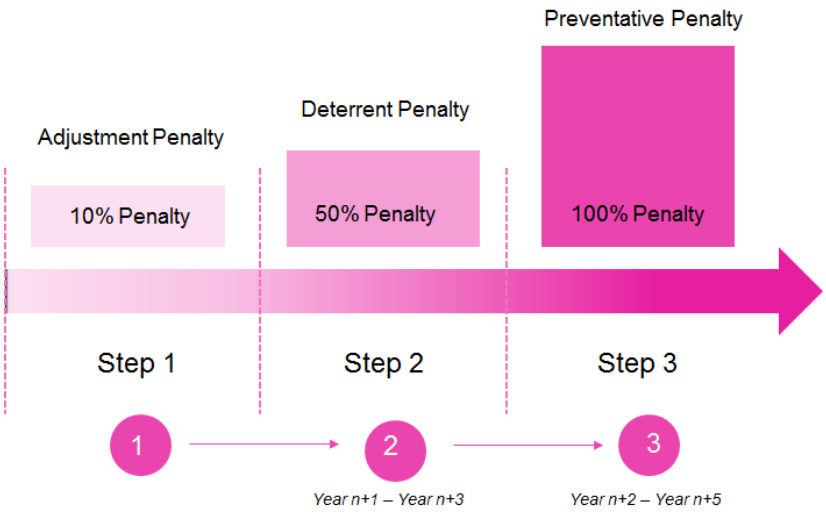
incentive for producers to change their product's design, than if different criteria were applied across Member States. Even if the fees are still small as a proportion of sales price, for a specific product, if sold in large enough quantities, the aggregate fees to be paid across the EU market as a whole may be sufficient to drive a change in design. This can be further facilitated through standardised reporting requirements in all Member States, as described in Section 3.1.5.1, in order to minimise the burden (and thus cost) of reporting eligibility for a bonus/reduced fee.

Secondly, while the financial incentive provided by the modulated fee may not directly incentivise a producer to change design, signalling to the ultimate consumer through labelling at the point of sale that the product that they are considering buying is eligible for a bonus (or indeed incurs a malus/penalty), and explaining the reason why, may be effective in influencing purchasing decisions.

Thirdly, it would seem appropriate in principle, given the constraints noted above, for modulation to focus on one, rather than several, criteria. The rationale for this would be to 'focus on doing one thing well', and avoid the possibility of modulation criteria that pull in different directions. For example, incentivising increased durability, should ideally not come at the expense of reduced recyclability. By way of example, shifting from a pure cotton item to a polycotton mix can make the garment more durable, but can complicate the recycling process. This can, of course, be addressed by setting minimum requirements for product design, that products have to meet, to ensure that any modulation will not lead to a negative change in the attributes that are covered by the minimum requirements.

Fourthly, a further incentive to change will arise through giving a clear steer as to how the magnitude of the penalty (or bonus) will increase in future years. An example of this from Citeo, the French packaging EPR scheme, is shown in Figure 3-4. To know that the financial incentive will endure, and increase, will provide greater certainty that the cost of design changes will be merited.

Figure 3-4 A Continuous and Increasing Penalty



Source: Citeo

The question of which criteria should be the focus of eco-modulation for textiles is an important one, which depends in part upon the wider policy landscape. Fee modulation within EPR schemes is just one of a number of policy tools that may be used to achieve specific objectives, and it's important to consider the extent of change that modulation can bring about given the specific criteria to be applied, and whether other tools would be likely to bring about greater change in a more efficient way.

For textiles, there is a strong case for a number of minimum eco-design requirements, that will both improve environmental performance directly, and support the effectiveness of EPR in driving change. These include:

- A ban on substances of very high concern;
- The implementation of minimum eco-design requirements in respect of durability for stress resistance and lifetime of products and components;
- The implementation of minimum eco-design requirements to enable disassembly for replacement and repair, or for recycling; and
- The implementation of minimum repairability and modularity requirements.

See Section 4.0 for further detail on these complementary policy measures. Standards already exist in some of these areas. For example, Re_Fashion references a number of different standards relating to dimensional stability, resistance to abrasion, resistance to tearing and colour fastness in its durability criteria for modulated fees. Other standards are also in development to further establish durability requirements, for example with regard to fibre fragmentation.[42] Where standards already exist, they can be incorporated into minimum eco-design requirements.

Fee modulation can work well in combination with minimum requirements. Modulation can be used to incentivise improved performance, going beyond the minimum requirements. Minimum requirements can also ensure that incentives via modulation under one specific criterion do not undermine performance in another area (as described above in respect of durability and recyclability).

Modulation can also be used in a more 'exploratory' way that can lead to the development of standards in future. At present, there is no standard for 'recyclability' of textile products. On this basis, and given the very low levels of fibre-to-fibre recycling of textiles, this would seem an aspect that could benefit from incentives through fee modulation. This would require collaboration to agree the requirements for an item to be considered more or less recyclable, but could focus in the short term on the more obvious 'disruptors', i.e. fabrics, substances or attachments that are known to negatively impact recycling processes. For example, multi-fibre blends, or products containing >2% elastane.

Recycled content could also be a criterion for modulation – it already is within the French scheme, with a 50% bonus of fees per item where the product contains at least 15% recycled fibres/

[42] Euratex (2021). Textile and apparel industry alliance moves closer to release of an international microfibre shedding standard. September 2021. Available at: https://euratex.eu/news/textile-and-apparel-industry-alliance-moves-closer-to-release-of-an-international-microfibre-shedding-standard/

materials from household textiles (recycled polyester from plastic bottles is excluded). A challenge here, however, relates to the verification of such claims. The nature of the evidence to be provided by producers to demonstrate their liabilities under fee modulation is an important consideration. In order to minimise administrative burden, and to provide clarity, it is preferable to use readily verifiable characteristics. It is thus better to avoid modulating on a criterion for which the provision of evidence is unduly burdensome, or indeed the evidence itself is of a nature that is readily open to challenge.

There are also suggestions that fee modulation could be used to incentivise a reduction in the number of new items placed on the market by a producer. However, the challenge with this is that some producers might naturally expand their market share from one year to the next, while others might have a reduced market share. From the perspective of using EPR to reduce consumption, it would arguably be better to rely on setting high performance targets, and ensuring full cost coverage, in order to maximise the size of the fees relative to product value and thus increase the upfront costs of textile items to consumers. Further policy measures such as taxation of virgin material could then be used to increase upfront prices further.

Another possibility would be to modulate in favour of enhanced disclosure of material and chemical information, going beyond minimum requirements that may be limited to SVHCs, for example. There could also be specific criteria targeted at particular materials, e.g. the levels of microplastic loss for synthetic materials (dependent, of course, upon an appropriate measurement method).

This last point highlights a particular challenge presented by textiles – the heterogeneity of the types of items and the ways in which they are manufactured. Accordingly, it is very difficult to identify a clear frontrunner in terms of criteria for modulation across all categories. Indeed, it could well be more appropriate to determine the most appropriate criteria for modulation on a product category basis, meaning that different modulation criteria apply to different product categories. For some categories, durability may be the key challenge, recyclability may need improving in others, and for some categories the focus might need to be on hazardous chemicals.

This would still permit a harmonised approach, within the relevant product category, and given a more targeted focus, it may be that one obvious criterion for modulation arises, or if more than one were to be applied, due consideration of the potential effects would be made easier due to the more focussed application within a product category.

In summary, it is not yet possible to identify a single criterion for modulation for textiles that is clearly preferable to any other criteria, across all textile types. On the basis that modulation can be a means to bring forward the development of agreed standards that can be used to provide transparent evidence for a bonus or a malus, and the lack of any existing standards in terms of recyclability, it may well be that recyclability is the criteria to focus on. However, this would be contingent on whether or not mandatory minimum standards are applied in areas such as durability, in order to ensure recyclability does not compromise durability in specific cases.

There is a clear role here for the European Commission to take a lead in further analysis and engagement with stakeholders in order to identify the most relevant criteria by product category. In the absence of such leadership, there is a risk of divergent, and potentially poorly focused, criteria across Member States, which would significantly limit the extent to which positive environmental change will be driven by modulation.

3.1.6 Governance and Administration

EPR for textiles would have four different levels of governance and administration, as shown Table 3-2.

Table 3-2 Four levels in respect of Governance and Administration

Level	Tasks
Guidance – European level	Set the following minimum requirements for textiles EPR schemes through an Implementing Act Set performance targets for textiles Establishing an EU-level definition for obligated Producers Establishing an EU-level classifications for when textiles become waste Establishing EU-level classifications for granularity of fee structure and associated reporting obligations Establishing EU-level criteria for eco-modulation and associated reporting obligations
Oversight – national government	Ensuring the EPR scheme is discharging its responsibilities in accordance with national policies and targets Supervision, due diligence and enforcement for producers, used and waste textile management operators and the EPR scheme e.g. EPR fee reviews, verification of waste management processes in line with standards Coordination of external expert advisory group engagement regarding the scheme, such as waste management operators, academics, civil society organisations.
Strategic management – board of directors of the EPR scheme	Set the EPR fees Ensure the fees are accurately and appropriately allocated Monitor the effectiveness and impact of the scheme
Day-to-day management – EPR scheme employees	Onboarding new members Residual waste composition studies Reporting Scheme review and optimisation Internal administration for the scheme Managing EPR communications

The following activities would need to be undertaken by the relevant entities, as indicated.

Due Diligence

Obligatory due diligence must be carried out on all actors within the EPR scheme. This will include:

- EPR scheme-led review to ensure Producers and Used and Waste Textile Management Operators are submitting the required data and that it is accurate;
- Third party audits to ensure confidence in accuracy of Producers and Used and Waste Textile Management Operator data;
- EPR scheme-led audits to ensure the fees paid to contract used and waste textiles management operators are representative of those of a cost-efficient service;
- Third-party led ad-hoc external audits of Producers and Used and Waste Textile Management Operators (data checks and physical checks as required) to ensure scheme compliance.
- Oversight led audits of the PRO to ensure it is discharging its responsibilities appropriately.

This due diligence will require appropriate enforcement measures in the form of penalty fees representative of the severity of the issue to mitigate non-compliance.

Reporting

Activities to include:

- Collection and verification of data & evidence reported from Producers (quantity of products POM, products POM under eco-modulation criteria plus any other relevant activities such as repair etc.)
- Collection and verification of data & evidence reported from Used and Waste Textile Management Operators (operational costs, total tonnages collected, outputs from sorting, export etc.);
- Analysis of data;
- Internal reporting to Producers and Used and Waste Textile Management Operators; and
- External publishing (data regarding collection, sorting, recycling, disposal, progress against targets etc).

3.1.7 Single or Competing Schemes?

Existing EPR schemes vary considerably in their design, and there are a number of features that affect performance and costs.[43] There is limited empirical evidence available in respect of the role of competition between schemes in scheme performance and costs. In general, reflecting the lack of a strong empirical basis for making arguments, the case for competition between PROs is largely made on the basis of the theoretical underpinnings regarding the efficiency gains which might be derived from resort to the use of markets to deliver policy outcomes.

However, as EPR schemes move from:

[43] Given that experience of textile EPR is currently limited, consideration is given to the arguments in respect of single versus competing schemes for packaging.

1. partial cost coverage and relatively low recycling targets (or with 'recycling' measured such that losses that occur prior to recycling are not taken into account); to
2. a situation where
    a. a more complete range of costs have to be covered (and fully funding relevant costs incurred by contractors);
    b. fees are modulated according to environmental features; and
    c. recycling is measured at the point where material is actually recycled,

it becomes more difficult to see upon what basis compliance schemes might genuinely compete.

Some considerations of how a single scheme might compare to competing schemes in a number of areas are presented below:

- EPR fees
  - Competing PROs are argued by some to lead to cheaper fees due to the effect of competition. However, while competition makes sense in terms of procuring collection contracts, for example, this procurement can be undertaken by a single EPR scheme without any undermining of competition between different collection contractors. Under a full net cost EPR scheme the scope for competition between schemes seems rather limited – potentially just to the cost of their administration processes (which would be duplicated compared to where there is a single scheme).
  - Under a single scheme, owned by industry and run on a not-for-profit basis, the incentive for the owners (industry) is to discharge their responsibility in respect of performance targets in the most efficient way. This should include processes to ensure that they are procuring all services in a manner that ensures cost-effectiveness. Sufficient transparency for members to understand how their fees are being spent, and to Government on scheme performance will be required.
- Transparency
  - Single schemes tend to publish their fees online
  - Competing schemes do not typically share their fees publicly
- Material ownership
  - A single PRO would own or control all the collected material and would be in a strong position to negotiate a good price with the purchasers of secondary materials
  - Competing PROs would be competing against each other in terms of material sales
- Ability to guide strategic investment in infrastructure
  - Partly related to the question of material ownership above, a single EPR scheme would be able to guarantee feedstock supply to new facilities, increasing the confidence of potential investors in new facilities. This is likely to be of particular importance with respect to textiles, due to the immaturity of the textiles recycling industry. The scheme would also be in a good position to plan and invest in infrastructure itself and to coordinate investment across Member States, allowing economies of scale to be optimised. This will be particularly relevant for recycling technologies that may only be viable at a scale well above average Member State level.
  - Under a situation where schemes compete, each one would not individually be able to offer similar guarantees in terms of feedstock supply. Multiple competing schemes also makes decision making in relation to strategic infrastructure more complex.
- Reporting

  - A single PRO ensures that all data is consolidated with reduced risk of lost information and fraud. This means there is one entity with a clear overview of what is being reported as placed on the market
  - Each competing PRO would be collecting its own data, thus requiring an additional step to consolidate (at government level) to ensure all reporting quantities match. No one PRO would have a clear view of what is being placed on the market
- Compliance monitoring
  - With a single PRO to monitor it is easier for Government to provide oversight
  - With multiple PROs to monitor the oversight effort by Government is increased
- Administration costs
  - Under a single PRO there are reduced and more efficient costs of administration44
  - Competing PROs would each incur administration costs, potentially being more expensive or inefficient for the overall system

Given the above points, and in particular the fact that there will be a significant need for targeted investment in infrastructure for the management of used and waste textiles, it would seem that a single scheme, subject to appropriate Government oversight, would be more efficient than several competing schemes.

3.2 Objectives addressed through EPR

In the sections below we consider the extent to which the different objectives identified in Section 2.4, and relevant objectives within the Circular Economy Action Plan, can be addressed through well-designed EPR.

3.2.1 EPR and the identified textiles objectives

The textiles EPR approach developed in Section 3.3 is most adequate in addressing Objective 1: reducing the global environmental impact of the apparel and textiles industry, throughout the textiles ecosystem, to within planetary boundaries. However, there are several sub sections of the objective that EPR does not fully address (see Table 3-3). As EPR is predominantly focused on end-of-life management – albeit with some features to potentially tackle eco-design – it is difficult to strongly link EPR with parts of the objective related to the five previous life-cycles stages.

[44] The UK Government's EPR consultation document reports that a single packaging PRO would incur £20M in overhead costs and require 248 FTEs while competing PROs would incur in £25M in overhead costs and require 272 FTEs. Source: Defra, NRW, Welsh government, Scottish government, Daera (2021), Extended Producer Responsibility for Packaging Consultation Document, available at https://consult.defra.gov.uk/extended-producer-responsibility/extended-producer-responsibility-for-packaging/supporting_documents/23.03.21%20EPR%20Consultation.pdf

Table 3-3 Extent to which EPR addresses sub-section of Objective 1

Sub-sections of Objective 1		Addressed by EPR?	Explanation
1	Reducing greenhouse gas emissions	Partially impacted by EPR	Will influence reduction in GHG emissions indirectly, through for example reduction in consumption of new textiles, and through uptake of recycled materials, reducing the demand for virgin material
2	Reducing water consumption	Partially impacted by EPR	Will influence reduction in water usage indirectly, through for example reduction in consumption of new textiles, and through uptake of recycled materials, reducing the demand for virgin material.
3	Reducing the impacts of pollution on land and in water at the source	Partially impacted by EPR	Will influence reduction in pollution if modulating fees on specific chemicals criteria/labelling (see Section 3.1.5.2); or indirectly through reduced consumption of new textiles, reducing the demand for virgin material.
4	Maximising resource efficiency and optimising materials management in the supply chain	Partially impacted by EPR	Will influence resource efficiency indirectly, for example supporting the production and utilisation of secondary raw materials within textile products through recycling/recycled content targets, investment in reprocessing infrastructure, and R&D.
5	Reducing EU consumption of new apparel and textile products	Partially impacted by EPR	Will influence consumption reduction as a result of costs covered by EPR increasing the upfront price paid by the consumer for the textile product.
6	Improving systems for the management of unwanted apparel and textiles	Main focus of EPR	Provides funding for systems to improve the management of used and waste textiles and so minimise the quantity disposed of, as detailed in Section 3.1.5.
7	Minimising the quantity of apparel and textiles incinerated or landfilled	Main focus of EPR	
8	Maximising transparency within the apparel and textiles value chain to increase understanding of material flows and environmental impacts	Partially impacted by EPR	Supports the transparency for the management of used and waste textiles through EPR reporting requirements. To an extent, supports reporting regarding particular upstream design elements such as recycled content (through fee modulation reporting). However, there is little influence on the provision of data regarding upstream material flows and environmental impacts.

The sub-objectives in yellow would benefit from complementary, targeted measures to fully address them.

In addition, it is not clear that EPR can address Objectives 2 and 3 in any clear or meaningful way. EPR is more suitable for environmental objectives and must therefore be supported by separate policies to address social and animal ethics impacts if these are to be tackled.

3.2.2 EPR limitations with regards to the Circular Economy Action Plan

The EU's comprehensive EU Strategy for Textiles, envisaged for publication in 2021 but delayed until March 2022[45], has several overarching objectives to which EPR responds[46]: strengthening industrial competitiveness and innovation in the sector; boosting the EU market for sustainable and circular textiles, including the market for textile reuse; and addressing fast fashion and driving new business models. However, the Commission has also communicated more precise objectives for the Strategy which may or may not be met by EPR. These are considered in Table 3-4.

Table 3-4 Extent to which EPR addresses objectives of the EU Textiles Strategy as announced so far in CE action plan

Objectives of the EU Textiles Strategy	Addressed by EPR?	Explanation
Providing guidance to achieve high levels of separate collection of textiles waste	Partially addressed by EPR	Examples of well-functioning collection schemes, including those under EPR, will help inform the guidance.
Boosting the sorting, re-use and recycling of textiles, including through innovation, encouraging industrial applications and regulatory measures such as extended producer responsibility	Clearly addressed by EPR	Sets targets and provides funding of activities in support of meeting this objective.
Implementing eco-design measures	Partially supported by EPR	Some elements of eco-design could incentive through eco-modulation.

[45] Personal Communication with representatives from Changing Markets Foundation and the European Environmental Bureau on 9th November 2021
[46] European Commission (2020), *Circular Economy Action Plan*, July 2020, https://op.europa.eu/en/publication-detail/-/publication/45cc30f6-cd57-11ea-adf7-01aa75ed71a1/language-en/format-PDF/source-170854112

Objectives of the EU Textiles Strategy	Addressed by EPR?	Explanation
Ensuring the uptake of secondary raw materials	Partially addressed by EPR	Will facilitates the development of infrastructure and access to feedstocks, dependent on the associated recycling/recycled content targets and agreed financial incentives through fee modulation (recyclability, recycled content)
Empowering business and private consumers to choose sustainable textiles	Partially addressed by EPR	Consumers will only be influenced through EPR funded communications, while businesses would be incentivised through eco-modulation – depending on the agreed criteria (e.g., product durability, recyclability, chemicals).
Providing incentives and support to circular materials and production processes	Partially addressed by EPR	Potential to facilitate the uptake of recyclable materials through eco-modulation (recyclability).
Tackling the presence of hazardous chemicals	Partially impacted by EPR only through modulation	Will influence reduction in pollution if modulating fees on specific chemicals criteria/labelling.
Create easy access to re-use and repair services	Clearly addressed by EPR	Sets repair targets and provides funding of activities in support of meeting this objective.
Providing incentives and support to products-as-service models	Partially addressed by EPR	Requirement for fees for new textile products placed on the market, will provide an incentive for reuse models, if fees are high enough.
Increasing transparency through international cooperation	Partially addressed by EPR	International development funding will support cooperation to improve waste management in countries importing textile waste from Member States.

4.0 Complementary Policy Measures

In this section, we will propose a shortlist of complementary measures that appear promising in responding to the objectives that cannot best be addressed by EPR, and that can also enhance the effectiveness of EPR.

4.1 Selection Process

Given the limitations highlighted within Sections 3.2.1 and 3.2.2, a number of other complementary policy measures are required as part of an optimal textiles policy framework, to ensure that all objectives for the sector are met. A shortlist of complementary policies has been constructed in response to these limitations. The process to attain this shortlist was as follows:

1. A literature review of policy recommendations related to textiles as well as Eunomia's project experience led to **a comprehensive list of over 70 potential policies**. Sources included:
    a. 'Durable, repairable and mainstream, how eco-design can make our textiles circular', by ECOS – Environmental Coalition on Standards;
    b. 'The Circular Fashion Ecosystem – A Blueprint for the Future', by British Fashion Council;
    c. 'Product Environmental Category Rules' by the European Commission
    d. 'A New EU Strategy for Textiles & Clothing' by EURATEX;
    e. 'Recommendations for the EU Strategy for Sustainable Textiles' by Wardrobe Change Coalition;
    f. 'Circular Economy Perspectives in the EU Textiles Sector' by Joint Research Centre (European Commission); and
    g. 'Fossil Fashion: The hidden reliance of fast fashion on fossil fuels' & 'Synthetics Anonymous: Fashion brands' addiction to fossil fuels' by Changing Markets Foundation.
2. Policy measures that did not respond to any of the objectives (or overlapped with, but failed to support, objectives fully addressed by EPR) were discarded. Repetitive and/or vague policy measures were also removed. This process resulted in **a longlist of 32 policy measures to consider**. Some measures that respond to the same objectives as EPR remained in the longlist because they were able to support EPR be more effective in obtaining those objectives.

3. The longlist was further screened, leaving a **shortlist of 18 policy measures**. The screening criteria originated from the EU Better Regulation Tool #17[47] and are relevant to this textiles' study. These include:
    a. The level at which change is needed (i.e., at local government, Member State, European or global level)
    b. The legal feasibility (i.e., whether measures respect obligations arising from existing treaties)
    c. The technical feasibility (i.e., whether measures are technologically and technically possible to implement)
    d. The political feasibility (i.e., whether measures could likely garner sufficient political support for adoption and/or implementation)
    e. The policy's likely effectiveness (i.e., what scale of impact measures would have)
    f. The policy's expected efficiency (i.e., what scale of resources are necessary to implement measures relative to the impacts)

The project team used the criteria to guide decision-making around policies. Measures that were excluded from the shortlist can be found in the appendix A 4.0 with the justification for their exclusion.

4.2 Shortlist of Policy Measures

Out of the shortlist of complementary policy measures, a subset of measures directly supports the EPR scheme and should be implemented at the same time (section 4.2.1). The rest of the measures are listed in section 4.2.2.

4.2.1 Supporting measures for EPR

Some of the measures below can apply to all textiles, while some will need specific tailoring to particular product categories.

Banning the use of hazardous chemicals, as well as protecting human health more generally, will serve to facilitate recycling, thus making it easier for targets under EPR to be met. Implementing minimum eco-design requirements for durability, disassembly and repair will mean that eco-modulation, if focused on other criteria, will not negatively affect criteria subject to eco-design, or at least not below the minimum requirements. The standards for used textiles being exported to other countries outside the EU are an important measure to ensure EPR schemes are genuinely focused on driving improved performance, rather than simply exporting used and waste textiles overseas.

[47] European Commission. Better Regulation Toolbox 17, available at: https://ec.europa.eu/info/sites/default/files/file_import/better-regulation-toolbox-17_en_0.pdf

Table 4-1 Essential Measures to Support EPR

Measure	Description	Objectives
Ban the use of hazardous chemicals and materials or agree a concentration threshold thereof in clothing and textile products	Ban on SVHC[48] in unfinished and finished textile products. Provide guidance on investigating safer alternatives to SVHC in final products and production processes. Update REACH to make it address textiles specificities. Improve enforcement around REACH. Investigate chemical additives (dyes, anti-wrinkle agents, water repellents, flame retardants, antibacterial agents) and their wider effect on circularity, and environmental/human health impact.	1.3
Implement minimum eco-design durability requirements for stress resistance and lifetime of products and components	Define product-specific and component specific (fibre, yarn fabric construction, finish and colour) metrics to effectively test and compare durability (lifetime of products and stress resistance). Examples of requirements could be resistance to shedding, resistance to pilling, colour fastness properties, tear strength, dimensional stability, chemical stability, etc.	1.5
Implement minimum eco-design requirements for design practices per product category that allow disassembly for replacement and repair, or for recycling	Define product-specific metrics to effectively assess and compare the ease of non-destructive disassembly or products. These will need to consider any existing legislative requirements regarding durability, such as health & safety legislation for children's clothing.	1.4
Implement minimum repairability and modularity requirements	Ensure that brands can provide bespoke replacement parts and mend particular features of their products e.g., zips, buttons. Define product-specific metrics to effectively assess and compare the repairability of products	1.5
Implement product specific minimum standards for used textiles being exported to other countries	Define product-specific metrics to effectively test and compare conditions for export, depending on whether they be for reuse or recycling.	1.6 1.7
Implement or increase national taxes on residual treatment of textiles	While not a requirement that can be set at EU-level, national level taxes on residual treatment of textiles (based on compositional analysis) can help drive increased separate collection	1.7

4.2.2 Other complementary measures

Table 4-2 contains the shortlist of complementary measures, presented in order of affected lifecycle stages. For each policy measure, details are provided of potential sub-measures (where relevant), and which sub-objective(s) it meets.

[48] Substances of Very High Concern

Table 4-2 Additional Complementary Policy Measures to Facilitate a Circular Economy for textiles

FH = Farming & Harvesting, EPM = Extraction, Processing and Manufacturing, DR = distribution and retail, CU = consumer use, EOL = end-of-life

#	Life cycle stage	Complementary Policy Measure	Short title	Details – including sub-measures	Objectives
A	FH	Implement minimum robust, agreed and measurable standards for ethical animal farming related to clothing and textile products (and their production) placed on the market, for raw materials from both inside and outside of the EU.	Animal fibre farming standards	Define product-specific metrics to effectively assess and compare ethical animal farming practices related to clothing and textile products and their production	3.1
B	EPM	Tax on agreed impactful virgin materials (natural and synthetic)	Virgin material tax	Define material specific metrics to effectively assess and agree impact thresholds (environmental, social and animal welfare) that if breached result in a tax	1.4
C	EPM	Implement recycled content targets in textiles, ensuring recycled content is from closed loop recycling	Recycled content targets	Mandate the use of standardised certification and verification systems (and associated due diligence requirements) for recycled content claims for both pre- and post-consumer waste.	1.4 1.6
D	EPM	Create and implement a reporting and verification system across the value chain data for material inputs and flows, environmental, social and animal welfare impacts. This information will provide significant benefit for any targeted regulatory activity and due diligence.	Information	Commit to the exploration of technological systems to facilitate the implementation (e.g. blockchain, digital identification etc.). Mandate accredited/certified due diligence assessments for reporting across the value chain. Create a structured data gathering system on chemicals in the textiles value chain, including heavy metals, dyes, phenols, phthalates, flame retardants, PFAS, formaldehyde, etc.	1.3 1.8 2.3 3.2

#	Life cycle stage	Complementary Policy Measure	Short title	Details – including sub-measures	Objectives
E	EPM DR	Require textile companies to identify, prevent, mitigate, track and account for environmental and human rights, governance risks and impact throughout the textile value chain, including grievance mechanisms and access to remedy for affected workers and communities	Accountability across supply chains	EU led campaign to internationalise the International Accord for Health & Safety in the Textile and Garment Industry (Rana Plaza Accords). EU led campaign to make brands based in the EU prove fair labour practices of their suppliers/factories including provision of living wage, adequate H&S standards and fair working hours. Mandate a system of certification (e.g., fair trade labelling) for textiles adhering to fair labour practices, which needs to be robust and measurable.	2.1, 2.2
F	EMP CU EOL	Set maximum levels of microplastic release allowed during production, use phase, and end-of-life	Lifetime microplastic limits	Define metrics to effectively assess and compare the levels of microplastic release. Incorporate microplastics pollution considerations in all main instruments tackling textile products (Product Environmental Footprint, PEFCRs, etc). Mandate requirements for industrial pre-washing with capture for certain materials (which shed more fibres in initial washes49)	1.3
G	EMP CU EOL	Mandate the utilisation of filters to capture fibres at the consumer use stage with guidance on safe disposal of captured microplastics	Washing machine filters	Mandate the utilisation of filters to capture fibres in domestic and industrial washing machines, tumble dryers, washer dryers, dryers and washer, etc. Mandate requirement for wastewater treatment plants to capture microfibres[50]. This would work well to limit the impacts of fibres in combination with the	1.3

[49] Almorth, B. et al. (2018) Quantifying shedding of synthetic fibers from textiles; a source of microplastics released into the environment, *Environmental Science and Pollution Research*, Vol.25, pp.1191-1199.
[50] If necessary, with support from government subsidies to invest in the technology.

#	Life cycle stage	Complementary Policy Measure	Short title	Details – including sub-measures	Objectives
				measure describing maximum levels of microplastic release.[51]	
H	CU	Delivery of regular, national communication campaigns targeting consumers	Communication campaigns	The topics of the campaigns would be: methods to reduce environmental impacts during product use (e.g., lower temperature washing, etc); the impact of consumption (of both virgin and recycled material); and the promotion of proper product care, repair and reuse of textiles	1.1 1.3
I	EOL	Invest in developing and/expanding training and development in circular economy pathways (design, repairs, recycling, etc.)	Circularity training & development		1.5
J	EOL	Implement a VAT reduction for repair[52]	Cut VAT for repairs		1.5
K	EOL	Ban on the destruction of unsold stock and returned items, including sent to recycling, landfill or incineration	Ban overstock burning		1.5 1.7
L	All	Mandate the utilisation of product passports for all agreed products placed on the Member State market	Product passports	Further requires agreement on the data to be included within the product passport, such as a bill of materials and a bill of chemicals, environmental information, information on	1.6 1.8

[51] Rigby, S. (2020) Microplastics: Laundry filters 'dramatically' reduce fibres, *BBC Science Focus Magazine*, 16th July. Available at https://www.sciencefocus.com/news/microplastics-laundry-filters-dramatically-reduce-fibres/

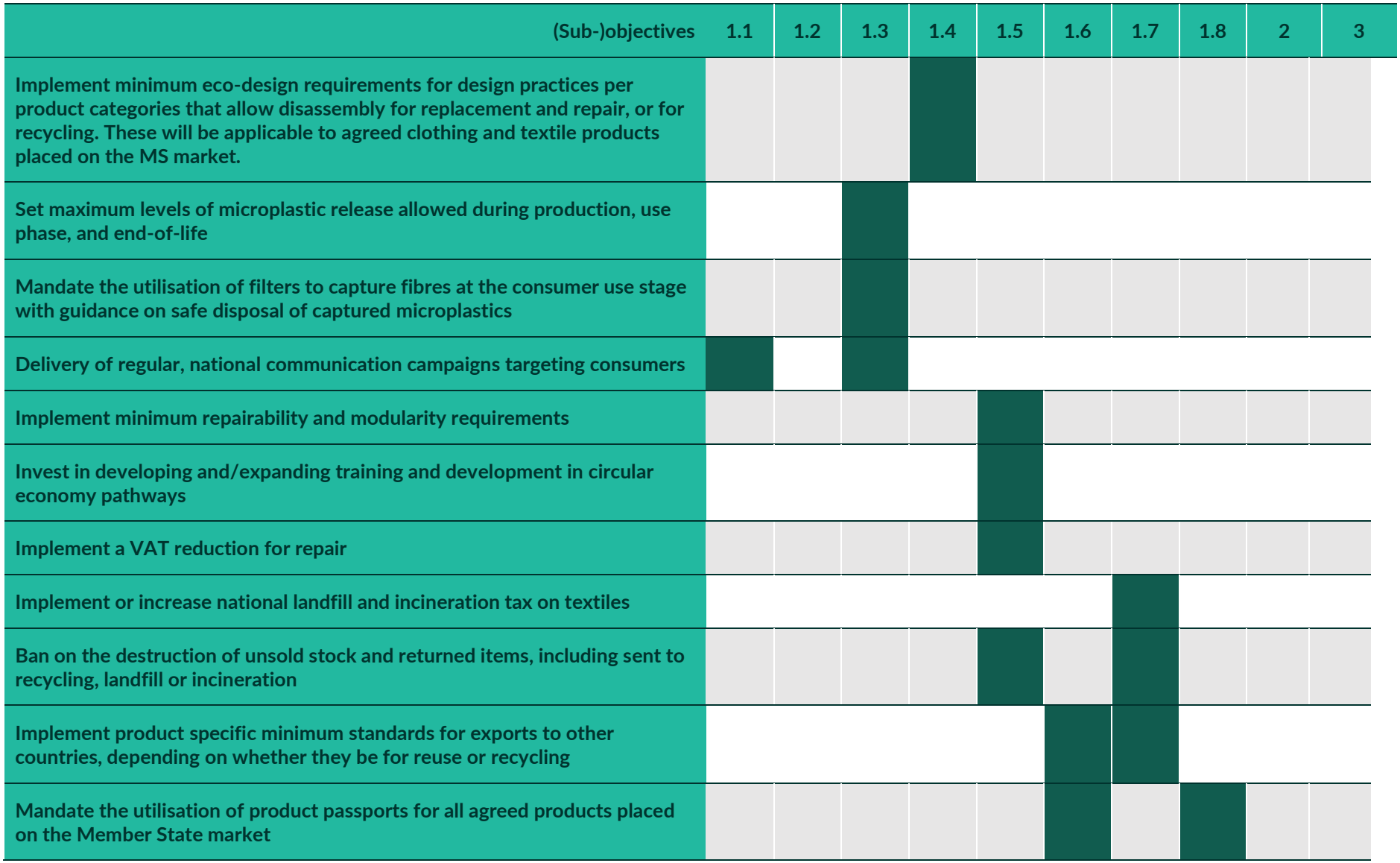
[52] Variations of VAT reduction on repair services exist for clothing and household linen in Belgium, Czech Republic, Ireland, Luxembourg, Malta, Netherlands, Austria, Poland, Slovenia, and Sweden.

#	Life cycle stage	Complementary Policy Measure	Short title	Details – including sub-measures	Objectives
				repairability and durability, due diligence (social and environmental), essential information regarding product circularity, links to external valuable data sources (LCAs, certifications, etc.).	

Table 4-3 shows how the shortlisted measures match the identified objectives.

Table 4-3 Mapping of EPR and recommended complementary measures vs objectives

(Sub-)objectives	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2	3
Extended Producer Responsibility (EPR)						■		■		
Implement minimum robust, agreed and measurable standards for ethical animal farming related to clothing and textile products (and their production) placed on the market, for raw materials from both inside and outside of the EU.										■
Ban the use of hazardous chemicals and materials or agree a concentration threshold thereof in clothing and textile products			■							
Tax on agreed impactful virgin materials (natural and synthetic)				■						
Implement recycled content targets in textiles, ensuring recycled content is from closed loop recycling				■		■				
Create and implement a reporting and verification system across the value chain data for material inputs and flows, environmental, social and animal welfare impacts. This information is a significant for any targeted regulatory activity.								■		
Require textile companies to identify, prevent, mitigate, track and account for environmental and human rights, governance risks and impact throughout the textile value chain, including grievance mechanisms and access to remedy for affected workers and communities									■	
Implement minimum eco-design durability requirements for stress resistance and lifetime of products and components					■					


(Sub-)objectives
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
2
3
Implement minimum eco-design requirements for design practices per product categories that allow disassembly for replacement and repair, or for recycling. These will be applicable to agreed clothing and textile products placed on the MS market.
Set maximum levels of microplastic release allowed during production, use phase, and end-of-life
Mandate the utilisation of filters to capture fibres at the consumer use stage with guidance on safe disposal of captured microplastics
Delivery of regular, national communication campaigns targeting consumers
Implement minimum repairability and modularity requirements
Invest in developing and/expanding training and development in circular economy pathways
Implement a VAT reduction for repair
Implement or increase national landfill and incineration tax on textiles
Ban on the destruction of unsold stock and returned items, including sent to recycling, landfill or incineration
Implement product specific minimum standards for exports to other countries, depending on whether they be for reuse or recycling
Mandate the utilisation of product passports for all agreed products placed on the Member State market

4.3 Remaining issues to explore

4.3.1 Recycled Content Targets

While in general, and as highlighted throughout the text, much remains to be done in terms of defining in detail how EPR schemes should best be configured, we highlight below some specific issues.

An aspect for further consideration is Policy C, the implementation of closed-loop recycled content targets. These targets have been highlighted by recyclers as the clearest signal for brands to invest in fibre-to-fibre recycling and increase the proportion within new clothing and textiles. However, there are a number of complexities with the implementation of such targets. The first is, if recycled content targets are set, this could incentivise taking post-consumer material for recycling, in preference to reuse, which would not be in accordance with the waste hierarchy. Secondly, a risk is that, without the proper certification and verification systems to evaluate recycled content claims, such claims could be inflated. These chain-of-custody certifications will need to be further investigated as a priority, to ensure they are robust enough to facilitate recycled content target setting, alongside or in replacement of recycling targets as outlined within the EPR policy.

Linked to both recycling and recycled content targets is the issue of specifying 'toxic substance free' recycled material. For post-consumer waste, testing can be carried out on "known" substances to verify that recycled materials do not breach threshold concentrations. However, it has been highlighted by stakeholder engagement that some Producers will not accept material if it has not been certified as toxic free through testing. This could place a substantial technical burden on recyclers to carry out exhaustive testing. There is the potential for coordination with REACH (Table 4-1) with regard to evaluation and authorisation of materials, however, this will need to be further investigated as a matter of priority to ensure systemic, safe uptake of recycled content.

4.3.2 Circular Economy Business Models

The shortlist addresses all the objectives formulated specifically for this study under Section 2.4, and partially addresses objective 2.2, to support the transition to economically and socially beneficial circular economy business models. The combination of the above will make such business models more viable. However, the objective is related only in part to maintaining a profitable and employment-driving textiles industry. It is also related to the need for a just transition to ensuring access to affordable but better-quality apparel that is durable and repairable. Currently, some consumers can only afford to buy low-cost fashion and textile products. This must be considered in the design of circular economy business and consumption models to ensure they are financially accessible to all consumers.

High levels of consumption are typically seen as indicative of a healthy economy, and for many years the focus on continuing growth of GDP has meant that consuming more 'stuff' is fundamental to perceived societal prosperity. Moreover, globalisation has meant that prices for

many items once seen as luxuries have declined, to the extent that they are now seen as essential items, and it is a rare politician indeed who says that we need to consume less.[53]

Accordingly, the policy challenge is to bring about significantly reduced levels of consumption, while maintaining or enhancing social wellbeing associated with the use of textiles products, and particularly looking to ensure that the poorest in society are not adversely affected by the changes.

Higher product prices for textiles should not, however, be seen as a problem. In fact they should be seen as more accurately representing better quality, high value items that are treated as such – built to last, shared, repaired. Indeed, these better-quality products and their higher prices will serve to facilitate the introduction of circular economy business models (CEBMs) including sharing, rental and resale, that would not currently be viable when competing against artificially low-priced and less durable products.

There is an additional role for policy, therefore, to manage the transition to a situation where far fewer products are consumed, but those new products are of much higher quality, are more durable, have higher usage rates, and the services provided by those products are adequately available to those on lower incomes.

While higher prices for products will help, they won't on their own bring about the desired transition in a manner that is both well managed, and socially just. It is important that the supporting policy interventions are well designed to bring about a smooth, but rapid transition, through enabling the establishment of more circular approaches.

[53] Erixon, F. (2018) The Economic Benefits of Globalization for Business and Consumers, European Centre for International Political Economy, available at https://ecipe.org/wp-content/uploads/2018/01/Globalization-paper-final.pdf

5.0 Concluding Comments

EPR should be a core component of the Textiles Strategy. It is a key mechanism by which the polluter pays principle can be operationalised, meaning that end-of-life costs will be borne by producers, rather than, as is typically the case, by municipalities, and by extension, citizens.

With a recent survey identifying 27% of respondents as 'high intensity' consumers of fashion items, it is only fair that those who consume more, pay more.[54] Another way of looking at it is that absence of EPR provides an explicit subsidy to consumption (along with implicit subsidies due to a lack of internalisation of external costs). Given that the challenge with textiles is, at root, one of over-consumption, it is essential that at the very least, the full end-of-life costs are covered through EPR, and incorporated into the price paid by consumers.

But EPR can do much more than transfer costs. It can be designed in ways to provide meaningful incentives to producers to change the design of their products. There are some specific challenges, however, when applying the approach to textiles.

Firstly, for a number of textile products, the EPR fees paid by producers may account for a relatively small proportion of the overall price. This can limit the strength of any incentive applied through modulation to change design. Ensuring full cost coverage, and meaningful performance targets should increase the size of fees, and in doing so increase the potential magnitude of the incentive they can provide. This study also suggests a number of ways in which, for a given magnitude of fee, the incentive provided through modulation can be maximised.

Secondly, the sheer range of types of textile and product types means that it may be most appropriate for modulation criteria to be closely targeted to specific product categories.

Harmonisation, to the extent possible, of a number of aspects is key to bringing about the greatest amount of change through modulation. This report makes a number of recommendations for the European Commission to take the lead in this area, notably in respect of:

- Establishing EU-level classifications for granularity of fee structure and associated reporting obligations; and
- Establishing EU-level criteria for eco-modulation and associated reporting obligations

[54] Institute of Positive Fashion (2021) The Circular Fashion Ecosystem: A Blueprint for the Future, 22 September 2021, available at: https://instituteofpositivefashion.com/uploads/files/1/CFE/Circular_Fashion_Ecosytem_Report.pdf

Further supportive actions that could be taken by the European Commission include:

- Setting performance targets for the collection and management of used and waste textiles;
- Establishing an EU-level definition for obligated Producers; and
- Establishing an EU-level classifications for when textiles become waste.

The report also identifies a range of supporting policy measures that will help to ensure the effectiveness of EPR, and also address objectives that cannot be addressed by EPR alone. The priority supporting measures include:

- Banning the use of hazardous chemicals and materials in clothing and textile products
- Implementing minimum eco-design requirements for stress resistance and lifetime of products and components
- Implement minimum eco-design requirements for design practices per product category that allow disassembly for replacement and repair, or for recycling
- Implement minimum repairability and modularity requirements

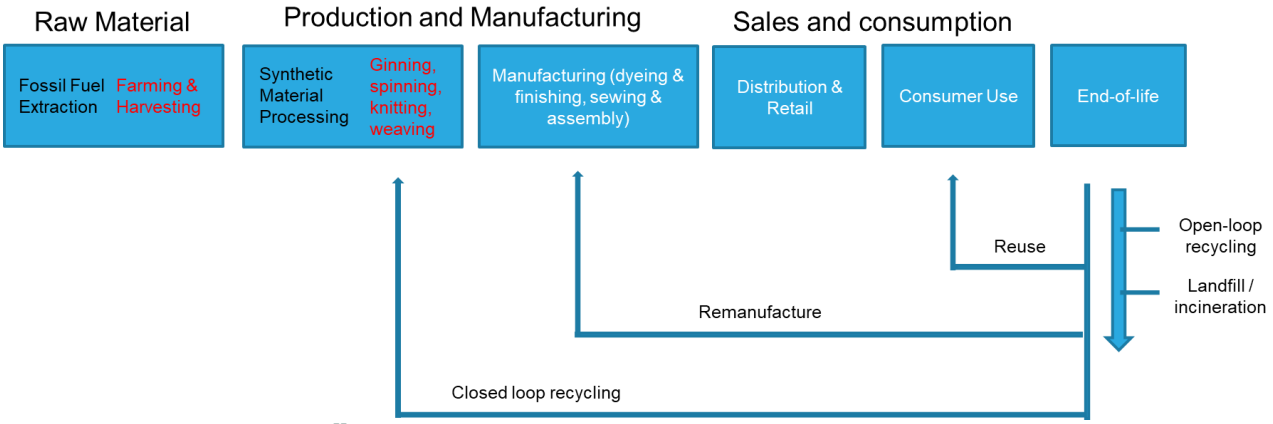
More research is needed, including detailed engagement with stakeholders, in order to develop the above targets, definitions, classifications, criteria, standards and reporting requirements. In the absence of EU-level leadership, the risk is that Member States may take divergent approaches that will increase costs to producers, while failing to deliver the benefits that could be achieved by taking a harmonised approach, and harnessing the power of the internal market to driver positive environmental change.

Appendices

A 1.0 Lifecycle of Textiles

The textiles lifecycle consists of 6 major stages illustrated in Figure 5-1.

Figure 5-1 The Lifecycle of Textiles



Source: Textile Value Chain (2019).[55]

The processes for natural and synthetic textiles differ at the raw material production stage (which encompasses the first two stages in the diagram). The processes for natural textiles in these two stages are in red text, and those for synthetic textiles in black text.

Raw Material Stage

The lifecycle of textiles starts at raw material production. For synthetic fibres, such as polyester and nylon, this includes fossil fuel extraction and the processing of this raw material into fibre. For natural fibres, such as cotton and hemp, this includes the cultivation of the crop and the processing of it into fibre, albeit through different processes to synthetic fibres. Leather is a natural material made from animal hides. However, raw hides must undergo several preparatory processes to remove undesirable components before it is suitable for the later stages in the leather manufacturing process such as soaking, dehairing and pickling with sulphuric or formic acid.[56] Cellulosics are semi-synthetic. The raw material is made from natural cellulose or its derivatives. For example, this can come from wood or seaweed. However chemical processing is required to turn the raw material into fibre.[57]

Production and Manufacturing Stage

After the raw material is extracted, cultivated or produced through other means, such as the chemical or mechanical recycling of plastic bottles, the material is spun, knitted or woven into raw fabric. For non-woven textiles, the material is made through a bonding process using

[55] Textile Value Chain (2019) Lifecycle Analysis of Textiles, accessed 23 September 2021, https://textilevaluechain.in/in-depth-analysis/articles/textile-articles/¬life-cycle-analysis-of-textiles/
[56] The Leathersellers' Company (2021) Leather Manufacturing Process, accessed 12 November 2021, https://leathersellers.co.uk/leather-industry/leather-manufacturing-process/
[57] Changing Markets Foundation (2018) Roadmap Towards Responsible Viscose & Modal Fibre Manufacturing, 2018, https://changingmarkets.org/wp-content/uploads/2018/02/Roadmap_towards_responsible_viscose_and_modal_fibre_manufacturing_2018.pdf

solvents or adhesives.[58] Leather alternatives have different processing methods depending on their raw material. For example, to make Piñatex, a leather alternative made from waste pineapple leaves, long fibres are extracted from the leaves using semi-automatic machines, mixed with polylactic acid and undergo a felting process to create a non-woven mesh.[59] Raw hides used in leather products undergo a tanning process with chemical agents such as chromium salts, vegetable tannins and glutaraldehyde to prevent decay.[60]

The next stage in the lifecycle of textiles is manufacturing, which includes processes such as dyeing & finishing. These processes convert the material, such as woven or knitted fibre, tanned leather or other material into 'usable' textiles, which have the desired colour, look, feel and performance. These processes differ by material. For example, a unique process used for leather is fatliquoring to add moisture back in after dyeing.[61] Manufacturing also includes sewing & assembly, turning the material into the item of clothing, footwear or household or professional linen.

Sales and Consumption Stage

Once manufactured, the next stage of the textile lifecycle is distribution & retail. This usually includes long transportation routes due to the global nature of textile supply chains.[62] During the consumer use phase, the utilisation of textiles will require regular washing and drying.

End-of-Life Stage

End-of-life is the stage of the lifecycle where the textile goes through a management system to process it for reuse, remanufacturing, recycling or disposal through incineration or landfill.

[58] International Chemical Secretariat (2021) *The Textile Process*, accessed 2 November 2021, https://textileguide.chemsec.org/find/get-familiar-with-your-textile-production-processes/
[59] Ananas Anam (2021) *About Us*, accessed 11 November 2021, https://www.ananas-anam.com/about-us/
[60] Best Leather (2021) *Leather Tanning: The Tanning Process Explained*, accessed 3 November 2021, https://bestleather.org/leather-tanning/
[61] The Leathersellers' Company (2021) *Leather Manufacturing Process*, accessed 12 November 2021, https://leathersellers.co.uk/leather-industry/leather-manufacturing-process/
[62] European Environment Agency *Import, export, production and consumption flows of textile products, EU-28, 2017*, accessed 23 September 2021, https://www.eea.europa.eu/data-and-maps/figures/import-export-production-and-consumption

A 2.0 The Impact of Textiles

A 2.1 Environmental Impacts

Biodiversity/habitat loss and land use impacts occur due to problems found in almost every stage of the textile lifecycle. At the raw material production stage, this comes from the high land use demand of fossil fuel extraction, the cultivation of crops and rearing of animals for natural fibres and animal hides.[63] This is exacerbated by current consumption models that drive increased outputs from the supply chain. This contributes to these environmental impacts as it drives greater levels of raw material production.[64] It also increases all the other corresponding environmental impacts, for example water consumption and pollution. Resource loss at various stages in the textile lifecycle also drives raw material production as it results in new textiles needing to be made to meet consumption demands. This can be caused by textiles that never make it to retail;[65] low cost, low durability clothes which are unable to be reused by consumers;[66] or the lack of recycling systems available for textiles.[67]

Water consumption and pollution are environmental impacts present throughout the textile lifecycle. At the raw material production stage, water pollution impacts, such as eutrophication and toxicity are caused by fertiliser,[68] herbicides, pesticides[69] and the fossil fuel extraction process.[70,71] The cultivation of crops, such as cotton grown in water scarce areas, also results in significant impacts.[72] Similarly, the production of synthetic materials also requires high levels of water consumption to produce the materials for fashion and textile products. Fossil fuel extraction consumes water through processes such as drilling and hydraulic fracturing or fracking. Water is also used during the fossil fuel refining process.[73] The manufacturing, consumer use and end-of-life stages, can all lead to water pollution. This is due to the wide variety of chemicals used, if wastewater treatment systems are not in place to remove the pollutants prior to discharge. Examples of hazardous chemicals include acrylonitrile used to

[63] Harfoot, M.B.J., Tittensor, D.P., Knight, S., et al. (2018) Present and future biodiversity risks from fossil fuel exploitation, *Conservation Letters*, Vol.11, No.4, p.e12448
[64] Ellen MacArthur Foundation (2017) *A New Textiles Economy*, accessed 5 September 2019, https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-Textiles-Economy_Full-Report.pdf
[65] Šajn, N. *Environmental impact of the textile and clothing industry*, Report for European Parliament, https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS_BRI(2019)633143_EN.pdf
[66] Environmental Audit Committee (2019) *Fixing fashion: clothing consumption and sustainability*, February 2019, https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/1952/full-report.html
[67] Ellen MacArthur Foundation (2017) *A New Textiles Economy*, accessed 5 September 2019, https://www.ellenmacarthurfoundation.org/assets/downloads/publications/A-New-Textiles-Economy_Full-Report.pdf
[68] Global Fashion Agenda, and The Boston Consulting Group (2017) *Pulse of the Fashion Industry*, 2017, https://www.globalfashionagenda.com/publications-and-policy/pulse-of-the-industry/
[69] Mendes, K.F., Régo, A.P.J., Takeshita, V., and Tornisielo, V.L.(2019) *Water Resource Pollution by Herbicide Residues*, London: IntechOpen
[70] Allen, L., Cohen, M.J., Abelson, D., and Miller, B. (2012) Fossil Fuels and Water Quality, in Gleick, P.H., (ed.), *The World's Water* (2012) Washington, DC: Island Press/Center for Resource Economics, pp.73–96
[71] Environmental Impacts Associated with Disposal of Saline Water Produced During Petroleum Production - Osage-Skiatook Petroleum Environmental Research Project - Completed, accessed 27 September 2021, https://toxics.usgs.gov/sites/produced_water/
[72] Global Fashion Agenda, and The Boston Consulting Group (2017) *Pulse of the Fashion Industry*, 2017, https://www.globalfashionagenda.com/publications-and-policy/pulse-of-the-industry/
[73] Allen, L., Cohen, M.J., Abelson, D., and Miller, B. (2012) Fossil Fuels and Water Quality, in Gleick, P.H., (ed.), *The World's Water* (2012) Washington, DC: Island Press/Center for Resource Economics, pp.73–96

make acrylic fibres[74], terephthalic acid used in polyester manufacturing,[75] resins containing formaldehyde used in the finishing process,[76] and detergents.[77] For example, the viscose production and manufacturing process is highly chemical intensive which releases chemicals such as carbon disulphide, sodium hydroxide and sulphuric acid. These chemicals can cause acute aquatic toxicity as well as causing severe health impacts in the workers exposed.[78] The leather manufacturing process also uses a variety of chemicals including chromium, ammonia and solvents which can cause water pollution even if wastewater treatment is in place, due to the quantities needed for processing.[79] Water consumption at the consumer use stage is high due to the washing of textiles.[80] One study also found that many EU consumers underload their washing machines, increasing water consumption per unit of textiles.[81] Throughout the lifecycle, microfibres will also be released which, if they do not break down (in the case of synthetic fibres, or natural fibres coated in materials that do not themselves degrade), will remain in water systems. For example, this can be from the discharge of wastewater at the manufacturing stage[82] or the abrasion from wear at the consumer stage.[83]

Soil pollution can also be caused by microfibres throughout the lifecycle, wherever they are present. Microfibres in the environment cause cumulative impacts, including potentially contributing to biodiversity loss from animal ingestion.[84] Soil erosion can be caused by the removal of nutrients through farming methods used to produce the high quantities of raw materials needed to create new textiles.[85]

Greenhouse gas (GHG) emissions and air pollution occur at every stage of the textile lifecycle in various ways. For example, at the manufacturing stage, GHG emissions and air pollution is caused by the operation of machinery with fossil fuels, in particular coal. Emissions from electricity use will be dependent on the energy mix of each country, with fossil fuels continuing to account for a greater proportion of electricity generation than renewable energy, especially in developing countries with large textile manufacturing sectors on which the EU textiles

[74] *Acrylonitrile | ToxFAQs™ | ATSDR*, accessed 27 September 2021, https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=446&toxid=78
[75] Global Fashion Agenda, and The Boston Consulting Group (2017) *Pulse of the Fashion Industry*, 2017, https://www.globalfashionagenda.com/publications-and-policy/pulse-of-the-industry/
[76] Piccinini, P., Senaldi, C., and Summa, C. (2007) *European survey on the release of formaldehyde from textiles*, Report for DG SANCO, 2007, https://www.semanticscholar.org/paper/European-survey-on-the-release-of-formaldehyde-from-Piccinini-Senaldi/b803b712b37e903ed5ba540c8dee169b63feab5b
[77] Beton, A., Dias, D., Farrant, L., et al. (2014) *Environmental improvement potential of textiles (IMPRO Textiles)*, Report for European Commission Joint Research Centre, 2014, https://data.europa.eu/doi/10.2791/52624
[78] Changing Markets Foundation (2017) Dirty Fashion: How pollution in the global textiles supply chain is making viscose toxic, 2017, http://changingmarkets.org/wp-content/uploads/2017/06/CHANGING_MARKETS_DIRTY_FASHION_REPORT_SPREAD_WEB.pdf
[79] Hauber, C., Consultant, U., and Buljan, J. (2000) *Regional Programme for Pollution Control in the Tanning Industry in South-East Asia*, Report for United Nations Industrial Development Organization, 2000
[80] Beton, A., Dias, D., Farrant, L., et al. (2014) Environmental improvement potential of textiles (IMPRO Textiles), Report for European Commission Joint Research Centre, 2014, https://data.europa.eu/doi/10.2791/52624
[81] ibid.
[82] Norlin, E. (2021) *Microplastics from textiles to the ocean*, Report for KIMO Sweden, January 2021, https://www.kimointernational.org/news/kimo-report-on-microplastic-pollution-from-textiles/
[83] De Falco, F., Cocca, M., Avella, M., and Thompson, R.C. (2020) Microfiber Release to Water, Via Laundering, and to Air, via Everyday Use: A Comparison between Polyester Clothing with Differing Textile Parameters, *Environmental Science & Technology*, Vol.54, No.6, pp.3288–3296
[84] Thompson, A. (2018) *From Fish to Humans, A Microplastic Invasion May Be Taking a Toll*, accessed 4 February 2022, https://www.scientificamerican.com/article/from-fish-to-humans-a-microplastic-invasion-may-be-taking-a-toll/
[85] Al-Kalsi, M. (2000) Soil erosion: An agricultural production challenge, *Integrated Crop Management*, pp.141–143

market depends.[86,87] In some countries fossil fuels are used as an energy source directly. Furthermore, in many developing countries the energy source can be unreliable with frequent power outages.

This can force factories to use temporary sources of energy, such as diesel generators, further contributing to air pollution.[88] Transportation requirements throughout the textile lifecycle, but particularly during the distribution & retail stage, also contribute to this environmental impact.[89] At the consumer use stage, GHG emissions and air pollution can be caused by consumers powering their appliances, such as washing machines and tumble dryers, with non-renewable energy.[90] At the end-of-life stage the potential incineration of the textiles can also release polluting substances such as ammonia and the potent GHG nitrous oxide.[91] Microfibres can also be airborne which can contribute to air pollution wherever they are present. GHG emissions and air pollution can also cause social impacts as they can affect human health.[92] For example the use of hazardous chemicals, such as dihydric alcohol in polyester manufacturing can cause harm to workers[93] if adequate systems are not put in place to protect them.[94]

A 2.2 Social and Animal Welfare Impacts

There are numerous social impacts within the textiles value chain. A key component of these social impacts are the **human rights abuses** and **modern slavery** that continues to be prevalent in some parts of the textile industry. A recent well-publicised example of human rights impacts in the supply chain is the use of Uyghur forced labour to produce cotton in Xinjiang, China.[95] This is only one case of systemic social impacts worldwide. Another social impact of rising concern is the potential health impacts of microfibres. The World Health Organization has called for further assessment of the impacts of microplastics and microfibres on human health

[86] US EPA (2015) *Overview of Greenhouse Gases*, accessed 28 September 2021, https://www.epa.gov/ghgemissions/overview-greenhouse-gases
[87] Global Fashion Agenda, and The Boston Consulting Group (2017) *Pulse of the Fashion Industry*, 2017, https://www.globalfashionagenda.com/publications-and-policy/pulse-of-the-industry/
[88] ibid.
[89] European Environment Agency *Import, export, production and consumption flows of textile products, EU-28, 2017*, accessed 23 September 2021, https://www.eea.europa.eu/data-and-maps/figures/import-export-production-and-consumption
[90] Šajn, N. *Environmental impact of the textile and clothing industry*, Report for European Parliament, https://www.europarl.europa.eu/RegData/etudes/BRIE/2019/633143/EPRS_BRI(2019)633143_EN.pdf
[91] Assamoi, B., and Lawryshyn, Y. (2012) The environmental comparison of landfilling vs. incineration of MSW accounting for waste diversion, *Waste Management*, Vol.32, No.5, pp.1019–1030
[92] *Acrylonitrile | ToxFAQs™ | ATSDR*, accessed 27 September 2021, https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=446&toxid=78
[93] ibid.
[94] Global Fashion Agenda, and The Boston Consulting Group (2017) *Pulse of the Fashion Industry*, 2017, https://www.globalfashionagenda.com/publications-and-policy/pulse-of-the-industry/
[95] Uyghur forced labour in Xinjiang and UK value chains - Business, Energy and Industrial Strategy Committee - House of Commons, accessed 30 September 2021, https://publications.parliament.uk/pa/cm5801/cmselect/cmbeis/1272/127202.htm

after the release of research which discovered microplastics in drinking water and concerns over microfibre inhalation.[96,97]

Social inequality is another issue that is present throughout the textiles value chain. The raw materials production and manufacturing stage contributes value to local economies. However, due to competing markets for cheap products, brands and suppliers often reduce the price of their products which forces manufacturers to cut their costs to remain competitive.[98] This can contribute to inadequate standards of living and working for workers throughout the supply chain, both in developing and developed countries. Cutting costs can contribute to the exploitation of labour, such as textiles workers being forced to work excessive hours,[99] not being paid minimum wage or an optimum living wage, lack of employment rights such as statutory sick pay[100] and continuing issues regarding workplace safety.[101] The International Labour Organisation (ILO) estimate that 74% of men and 47% of women work more than 48 hours a week in the sector.[102] The Global Fashion Agenda reported that on average the minimum wage in the textile manufacturing industry is set at ½ of the legal minimum wage in the respective countries studied.[103] Also, non-compliance with minimum wage laws is prevalent. The ILO estimate in countries with deep non-compliance, a significant number of workers are paid less than 80% of the minimum wage.[104] With the rise of fast fashion, the prices brands are willing to pay have reduced significantly and these power imbalances were highlighted during Covid. McKinsey estimated that suppliers, such as brands and retailers, cancelled around $2.8 billion USD worth of orders which affected about 1.2 million workers, with many not given pay for work already completed.[105] At the other end of the lifecycle, fashion and textile exports from richer countries to poorer countries can contribute to social inequality. While significant value can be gleaned by other countries in the trade of used textiles, global prices for reusable and recyclable textiles are currently very low. If exported textiles are significantly worn-out, there is little profit to be gained from their reuse. This can be

[96] World Health Organization (2019) WHO calls for more research into microplastics and a crackdown on plastic pollution, accessed 18 January 2022, https://www.who.int/news/item/22-08-2019-who-calls-for-more-research-into-microplastics-and-a-crackdown-on-plastic-pollution
[97] EPA (2020) What You Should Know About Microfiber Pollution, Report for Environmental Protection Agency, July 2020, https://www.epa.gov/sites/default/files/2020-07/documents/article_2_microfibers.pdf
[98] Fashion Roundtable (2021) *Cleaning Up Fashion*, Report for All-Party Parliamentary Group for Ethics and Sustainability in Fashion (ESF APPG), July 2021, https://static1.squarespace.com/static/5a1431a1e5dd5b754be2e0e9/t/60ec3d173ba7d954d567ee0d/1626094876047/FR_ESF_Cleaning+up+Fashion_Report_2021.pdf
[99] Huynh, P. *Gender pay gaps persist in Asia's garment and footwear sector*, Report for International Labour Organisation, https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_467449.pdf
[100] Huynh, P. Gender pay gaps persist in Asia's garment and footwear sector, Report for International Labour Organisation, https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_467449.pdf
[101] Bangladesh Accord (2013) *The Bangladesh Accord on Fire and Building Safety*, accessed 6 October 2021, https://bangladeshaccord.org/
[102] ibid.
[103] Global Fashion Agenda, and The Boston Consulting Group (2017) Pulse of the Fashion Industry, 2017, https://www.globalfashionagenda.com/publications-and-policy/pulse-of-the-industry/
[104] Cowgill, M., and Huynh, P. Weak minimum wage compliance in Asia's garment industry, Report for International Labour Organisation, https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_509532.pdf
[105] The Business of Fashion, and McKinsey & Company (2021) *The State of Fashion 2021*, 2021, https://www.mckinsey.com/~/media/McKinsey/Industries/Retail/Our%20Insights/State%20of%20fashion/2021/The-State-of-Fashion-2021-vF.pdf

reduced further by the increased costs of sorting worn-out textiles, causing a financial burden on these poorer countries.[106]

Animal welfare impacts are present at the early stages of the textile lifecycle, although it indirectly impacts the whole textile lifecycle. Animal welfare impacts include using animals for skins and fur, especially if they are not kept and transported in humane conditions, suffer during the slaughtering process and undergo procedures which may cause unnecessary pain.[107] For example, mulesing in the wool industry or live plucking in the feather industry. The use of exotic skins from endangered animals is also a significant impact which can contribute to species extinction.

A 2.3 Financial impacts

The **financial impacts** of used and waste textiles management are another issue, principally in terms of the polluter pays principle not being respected. These costs are borne both by municipalities, in the case of disposal through household residual waste, and more and more by the used and waste textile industry (in particular sorters).[108] The revenues from management of used and waste textiles typically comes from the sale of the highest-grade fractions of collected material for resale and reuse. Waste exports can provide textile reuse opportunities for many developing countries. These materials are typically first handled by collectors and/or charities. However, prices paid for materials can fluctuate. The European Clothing Action Plan (ECAP) estimates that the price per kg textiles can fetch on global markets falls rapidly as the reusable share reduces.[109] This is particularly felt by sorters, who typically manage the remaining material for export.[110]

There has also been an increase in consumption of fashion and textiles in the EU. In particular, this is driven by cheaper “fast fashion” products, which are often of lower quality and trend led rather than emotionally durable. This is in part facilitated by the low price of synthetic fibres produced outside of the EU. While there is significant global variation in fibre pricing, imported synthetic yarns and blends have been consistently cheaper than other natural fibres over the last couple of decades.[111] Synthetic blends are also the cheapest EU-produced yarns, despite EU-produced pure synthetics being more expensive than cotton.

Some collectors and charities providing material to sorters continue to collect revenues on material paid for by sorters. At the same time, export customers continue to expect the same quality of clothing that has been received in previous years. Sorters, however, have highlighted the lowering quality of clothing, which reduces their profits. Greater quantities of fast fashion products within collection systems will increase the cost of management (collection, sorting

[106] ECAP (2018) *Used Textile Collection in European Cities*, March 2018, http://www.ecap.eu.com/wp-content/uploads/2018/07/ECAP-Textile-collection-in-European-cities_full-report_with-summary.pdf
[107] Plannthin, D.-K. (2016) Animal Ethics and Welfare in the Fashion and Lifestyle Industries, in Muthu, S.S., and Gardetti, M.A., (eds.), Green Fashion: Volume 2 (2016) Singapore: Springer, pp.49–122
[108] See A 2.0 for an overview of publicly available costs reported for used and waste textiles management.
[109] ECAP (2018) *Used Textile Collection in European Cities*, March 2018, http://www.ecap.eu.com/wp-content/uploads/2018/07/ECAP-Textile-collection-in-European-cities_full-report_with-summary.pdf
[110] Communications with sorting operators.
[111] European Commission. Joint Research Centre.(2021) Circular economy perspectives in the EU textile sector: final report., LU: Publications Office

etc.), but will not guarantee an associated increase in revenue as they may be unsuitable for resale and reuse.[112,113,114] At the same time, operating costs are increasing, in particular to sort and send greater quantities of material for recycling, which is typically done at a loss as global prices paid for bales of material for recycling are also currently very low.[115]

From an export perspective, there are also examples of products imported from developing countries that it has been found to not be reusable, for example of low quality, contaminated, or damaged. Some poorer countries also have limited collection and recycling infrastructure, so it is likely that these textiles then get incinerated, landfilled, or illegally disposed of.[116] This presents a financial burden for the local industry, and can negatively affect environmental and public health due to increased pollution and contamination.[117]

Any material not captured through collection systems, and so disposed of through residual waste, are borne by municipalities and, by extension, citizens.

A summary of some costs identified at various stages of used and waste textile management are illustrated in Table 5-1, based on larger European countries. It is important to note that there are significant variations in the way in which used and waste textiles are managed, from collection method and recycling process, to differences in geography and population density. This can cause the modelled or averaged actual costs to vary significantly.

Table 5-1 Cost for the Collection, Management and Disposal of Used and Waste Textiles (euros/tonnes)

Country	Management Step	Cost	Comments
France[118,119]	Collection (average logistics cost)	€100/t - €200/t	
	Manual Sorting (2019)	82€/t	Based on sorting costs funding of €16M & 196kt sorted in 2019
	Manual Sorting (cost range ex. transport & sale)	€230/t – €380/t	Dependent on the number of categories of textiles sorted – which can by <400

[112] WRAP (2021) *Textiles Market Situation Report* 2019, https://wrap.org.uk/sites/default/files/2021-03/WRAP-textiles-market-situation-report-2019.pdf
[113] Sourcing Journal (2015) Interview with Alan Wheeler (Director of the Textile Recycle Association)
[114] Forbrig, S., Fischer, T., and Heinz, B. (2020) Demand, consumption, reuse and recycling of clothing and textiles in Germany
[115] ECAP (2018) *Used Textile Collection in European Cities*, March 2018, http://www.ecap.eu.com/wp-content/uploads/2018/07/ECAP-Textile-collection-in-European-cities_full-report_with-summary.pdf
[116] Bukhari, M.A., Carrasco-Gallego, R., and Ponce-Cueto, E. (2018) Developing a national programme for textiles and clothing recovery, *Waste Management & Research*, Vol.36, No.4, pp.321–331
[117] Brooks, A.L., Wang, S., and Jambeck, J.R. (2018) The Chinese import ban and its impact on global plastic waste trade, *Science Advances*, Vol.4, No.6
[118] Baldini, S. (2021) Communication with Re_Fashion regarding waste management costs in France
[119] Re_Fashion (2019) Annual Report #2019

Country	Management Step	Cost	Comments
	Recycling (cost range ex. transport)	€100/t - €500/t+	Dependent on method of recycling (for example at the lower end lower quality recycling e.g. shredding/cutting into rags, at the higher end fibre-to-fibre recycling), nature of textiles preparation and buyer quality requirements
Germany[120]	Disposal (2020)	€200/t - €300/t	Highly dependent on region for disposal
UK[121,122]	Price collectors pay for bales of materials from textile banks (2021)	£50/t - £150/t	
	Price collectors pay for bales of materials from charity shops (2021)	£150/t - £330/t	
	Price collectors pay for bales of materials from sorters (2021)	£360/t - £450/t	Dependent on what collectors are willing to pay, market dynamics and the profit margins of sorting facilities (general price not directly related to operational costs)
	Landfill (2021)	£112/t - £123.70/t	Gate Fee + Tax
	Energy recovery (2021)	£103/t - £124/t	
Netherlands[123,124,125]	Collection	€22.40/t - €500/t	Dependent on how the textiles are collected e.g. household collection, container collection etc., and geographical location
		€200/t - €420/t	Crane unloading at low end of range, while door to door collections are at the top.
	Sorting	€350/t – €450/t	The high value refers to fine sorting into a large number of textile streams

[120] BVSE (2020) Demand, Consumption, Reuse and Recycling of Clothing and Textiles in Germany, https://www.bvse.de/dateien2020/2-PDF/02-Presse/06-Textil/2020/bvse-Textilstudie_2020_eng.pdf
[121] Let's Recycle (2021) Textile prices 2021, https://www.letsrecycle.com/prices/textiles/textiles-prices-2021
[122] Let's Recycle (2021) EfW, landfill, RDF Gate Fees, accessed 14 September 2021, https://www.letsrecycle.com/prices/efw-landfill-rdf-2/efw-landfill-rdf-2021-gate-fees/
[123] ECAP (2018) *Used Textile Collection in European Cities*, March 2018, http://www.ecap.eu.com/wp-content/uploads/2018/07/ECAP-Textile-collection-in-European-cities_full-report_with-summary.pdf
[124] Kort, M., von Grootel, M., de Waart, W., and Ooms, J. (2021) Towards an EPR for Textiles, March 2021, https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2021/05/20/bijlage-5-eindrapportage-upv-textiel-rebel-group/bijlage-5-eindrapportage-upv-textiel-rebel-group.pdf
[125] IEA (2020) *Waste disposal costs and share of EfW in selected countries*, https://www.iea.org/data-and-statistics/charts/waste-disposal-costs-and-share-of-efw-in-selected-countries

Country	Management Step	Cost	Comments
	Recycling	€300/t - €1,000/t	Lowest is based on mechanical recycling in the Netherlands, the highest is the estimated cost for chemical recycling.
	Incineration	€150/t - €300/t	Processors dispose of textiles that cannot be reused or recycled through incineration.
	Landfill	€46/t	Landfill tax + gate fee.
		€200/t	Based on public sources, this cost includes both the collection and processing of residual waste.
Sweden[126,127]	Total processing cost for sorting textiles (2020)	€780/t	Based on payment for goods, collection, sorting into all grades for resale/reuse, recycling and disposal
	Landfill	€110/t	
Northwest Europe[128]	Removal of hardware and labels before recycling (2020)	€620/t	

[126] Carlsson, J., Torstensson H., Rudrajeet, P., Manoj K. P. (2020), *Planning a Swedish Collection and Sorting Plant for Used Textiles*, https://smarttextiles.se/wp-content/uploads/2020/07/Planning-a-Swedish-Collection-and-Sorting-Plant-for-Used-Textiles.pdf

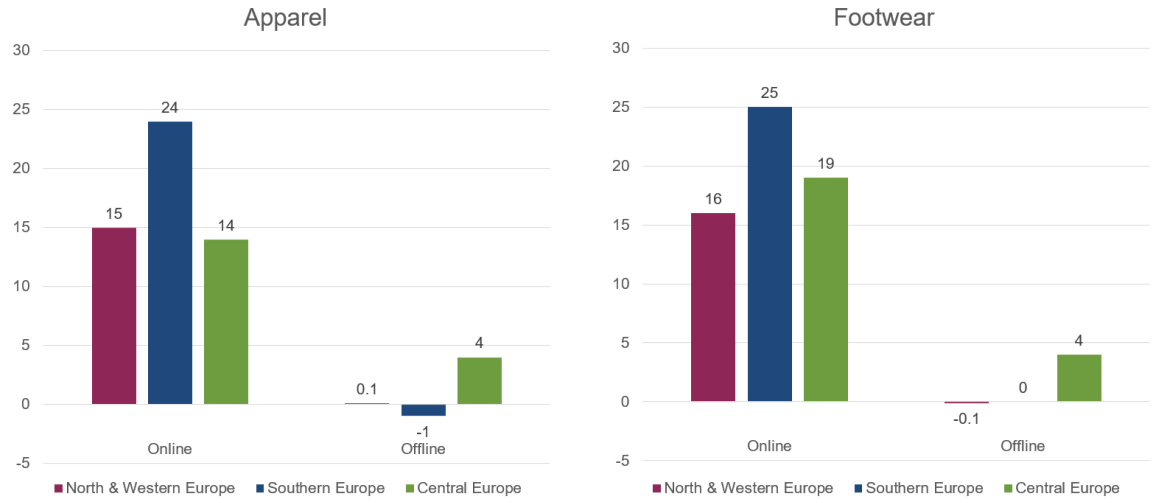
[127] IEA (2020) *Waste disposal costs and share of EfW in selected countries*, https://www.iea.org/data-and-statistics/charts/waste-disposal-costs-and-share-of-efw-in-selected-countries

[128] Interreg North-West Europe (2020) *Fibersort: Overcoming barriers for long-term implementation*, March 2020, https://www.nweurope.eu/media/9655/2020305-fibersort-51-final-case-studies-report.pdf

A 3.0 Key trends in sales channels

Though textiles' shift to e-commerce appears moderate in comparison with other categories (e.g., media and consumer electronics), it is already considerable**. Annual online growth rates have reached double digits for apparel and footwear**, significantly surpassing offline growth rates (see Figure 5-2) and are forecast to continue increasing.[129] Covid-19 further accelerated this trend, highlighting digital's resilience in a disrupted macro environment. E-commerce's share of fashion sales nearly doubled from 16% to 29% globally within eight months of 2020, achieving a share that was previously expected to take 6 years to reach.[130] In the European Union, e-commerce accounted for over 30% of the total fashion market, specifically accounting for 48% in the United Kingdom, 33% in Germany, 23% in France, 22% in Italy and 19% in Spain.[131]

Figure 5-2 Online vs. Offline Sales Compound Annual Growth Rate (CAGR) in Apparel and Footwear 2014-2017



Source: McKinsey (2019)[132]

Online marketplaces and online fashion retailers are growing. These online-only retailers represent more than 50% of online apparel and footwear sales in Northern & Western Europe.[133] In 2020, Amazon became the largest fashion retailer in Italy, and Zalando the second

[129] Ibid.
[130] The Business of Fashion, and McKinsey & Company (2021) *The State of Fashion 2021*, 2021, https://www.mckinsey.com/~/media/McKinsey/Industries/Retail/Our%20Insights/State%20of%20fashion/2021/The-State-of-Fashion-2021-vF.pdf
[131] The Global Fashion Business Journal (2021) *Top fashion retailers in Europe after Covid-19: Amazon leads Italy, Intersport takes France*, Accessed 14th September 2021, https://www.themds.com/companies/top-fashion-retailers-in-europe-after-covid-19-amazon-leads-italy-intersport-takes-france.html
[132] McKinsey & Company (2019) *Online as the key frontline in the European fashion market*, May 2019, https://www.mckinsey.com/pl/~/media/McKinsey/Locations/Europe%20and%20Middle%20East/Polska/Raporty/Moda%20na%20e-commerce/McKinsey-report_Online-as-the-key-frontline-in-the-European-fashion-market.pdf
[133] Ibid.

largest in Germany.[134] Zalando reported a 39% rise in customers year-on-year in April 2020. [135] The growth in online fashion is due to increased digital interaction, innovation and shifting customer behaviour. Digital innovation such as livestreaming has helped online marketplaces and retailers bring a human interaction element to the digital shopping experience, while increasing convenience for customers.[136] Lastly, customers have been found to be willing to experiment and move away from their favourite brands, benefiting online marketplaces that host a wider variety of products and brands than brick-and-mortar shops.[137]

The rise of online marketplaces has **facilitated new players**: direct-to-consumer original brand manufacturers. In turn, online marketplaces are an easy and affordable platform on which these companies, typically SMEs, can sell directly to European consumers.[138]

The **cross-border nature of online marketplaces** has helped Asian manufacturers penetrate the European textiles market, with many direct-to-consumer original brand manufacturers based in China selling into the European market. In 2018, based on a combined average of five European marketplaces (Spain, Italy, France, UK and Germany), 39% of top Amazon sellers across all products were Chinese.[139] Similar trends apply to textiles, as one third of EU textiles and clothing sales are from China.[140] Suppliers are not limited to China. In 2019, the second largest textiles and clothing supplier to the EU was Bangladesh, followed by Turkey, the UK, Pakistan, Vietnam, Cambodia, Morocco, and Tunisia.[141] European consumers are largely drawn to Chinese and other Asian producers due to low prices and a wide product offering.[142] This desire has been driven partly by the fast fashion business model lowering the expected cost and increasing purchase frequency.

The rise of mobile devices, 'm-commerce', constitutes another trend, mainly driven by convenience. Shein, the fast-fashion online brand, uses countdown clocks and games in mobiles applications to make them more engaging and increase spend.[143] However, mobile sales in fashion have yet to take off significantly. The conversion rate (share of the website visits ending with a transaction) still remains significantly lower for mobiles than for desktops, 0.9% versus 3.2% respectively. Consequently, retailers are improving offerings to bridge the gap. Fashion e-

[134] The Global Fashion Business Journal (2021) *Top fashion retailers in Europe after Covid-19*.
[135] Zalando Corporate (2020) *Zalando Expects Double-Digit Growth in 2020*, Accessed 18 November 2021, https://corporate.zalando.com/en/investor-relations/news-stories/zalando-expects-double-digit-growth-2020
[136] Kestenbaum, R (2020) *Shoppable Livestreaming Is The Rage In China. Will It Take Off In The U.S.?* Accessed 18 November 2021, https://www.forbes.com/sites/richardkestenbaum/2020/08/19/shoppable-livestreaming-is-the-rage-in-china-will-it-take-off-in-the-us/?sh=bf8b82620496
[137] McKinsey (2020) *Consumer sentiment is diverging across countries*, October 2020, https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/a-global-view-of-how-consumer-behavior-is-changing-amid-covid-19
[138] The Business of Fashion, and McKinsey & Company (2021) *The State of Fashion 2021*, 2021, https://www.mckinsey.com/~/media/McKinsey/Industries/Retail/Our%20Insights/State%20of%20fashion/2021/The-State-of-Fashion-2021-vF.pdf
[139] Marketplace Pulse (2018) *Year in Review*, Accessed 14th September 2021, https://www.marketplacepulse.com/marketplaces-year-in-review-2018#chinasellers
[140] Euratex (2020) *Facts and Key Figures of the European Textile and Clothing Industry*, https://euratex.eu/wp-content/uploads/EURATEX-Facts-Key-Figures-2020-LQ.pdf.
[141] ibid.
[142] Wik Consult (2019) *Development of Cross-border E-commerce through Parcel Delivery*, Study for the European Commission, February 2019, https://www.wik.org/fileadmin/Studien/2019/ET0219218ENN_ParcelsStudy_Final.pdf
[143] Eley J. and Olcott Eleanor (2021) *Shein: the Chinese company storming the world of fast fashion*, Accessed 5th January 2022, https://www.ft.com/content/ed0c9a35-7616-4b02-ac59-aac0ac154324

commerce players now mostly provide 24-hour deliveries, and some allow free returns for consumers who prefer to try products on first.[144]

In-app purchases and purchases made through social media are rapidly growing. Customers receive a seamless shopping experience from their discovery of a product through to purchase. Emerging trends and technologies in this field include livestream purchasing and virtual realities to try on items.[145]

Advertising of e-commerce through social media has also increased. Social media 'influencers' promote online marketplaces, online retailers and brands, through Facebook, Instagram, and most recently through TikTok. The latter has been instrumental in the rise of Shein amongst Gen-Z consumers, whereby TikTok influencers post short clips of "Shein hauls".[146]

Online re-commerce, the **resale of second-hand textiles on digital platforms**, is another trend that has seen growth. This can be consumer-to-consumer or brands putting their products on these platforms. Vinted, an online marketplace for second-hand clothes, is used by roughly 45 million users across 12 European countries and the US.[147] Some brands, such as Levi's have even created their own re-commerce platform (Levi's Secondhand).[148] This trend is particularly driven by younger consumers' awareness of sustainability and the negative impacts of fast fashion.

Publicly available data largely pertains to clothing and footwear, and does not include household and professional linen. However, wider data suggests the latter is experiencing similar developments to fashion textiles. For example, a global study on elements of household and professional linen (including mattresses, bed linen, pillows, blankets and 'others') reveals a significant rise in e-commerce that is set to continue. [149]

[144] McKinsey & Company (2019) *Online as the key frontline in the European fashion market*, May 2019, https://www.mckinsey.com/pl/~/media/McKinsey/Locations/Europe%20and%20Middle%20East/Polska/Raporty/Moda%20na%20e-commerce/McKinsey-report_Online-as-the-key-frontline-in-the-European-fashion-market.pdf
[145] BoF-McKinsey, State of Fashion 2022 Survey
[146] Eley J. and Olcott Eleanor (2021) *Shein: the Chinese company storming the world of fast fashion*, Accessed 5th January 2022, https://www.ft.com/content/ed0c9a35-7616-4b02-ac59-aac0ac154324
[147] TechCrunch (2021), Vinted raises $303M for its 2nd-hand clothes marketplace, used by 45M and now valued at $4.5B, Accessed 23rd November 2021, https://tcrn.ch/2R45bDR
[148] Murphy, M (2021) *There's A Quiet Revolution Underway With Recommerce*, Accessed 18th November 2021, https://www.forbes.com/sites/niallmurphy/2021/02/17/theres-a-quiet-revolution-underway-with-recommerce/?sh=27393fd05bfc
[149] Grand View Research (2021), Home Bedding Market Size, Share & Trends Analysis Report By Type (Bed Linen, Mattress, Pillows, Blankets), By Distribution Channel (Offline, Online), By Region, And Segment Forecasts, 2021 – 2028, Accessed 30th September 2021, https://www.grandviewresearch.com/industry-analysis/home-bedding-market

A 4.0 Policy Measures Excluded from Shortlist

FH = Farming & Harvesting, EPM = Extraction, Processing and Manufacturing, DR = distribution and retail, CU = consumer use, EOL = end-of-life

Table 5-2 Policy measures excluded from the shortlist

Life cycle stage	Complementary Measures	Including one or a combination of more detailed measures	Justification of exclusion from shortlist	Additional comments
EPM	Develop guidance on sustainably and ethically sourced materials, provided these are used for longer lifetimes and go hand-in-hand with overall reduction of virgin resource use	Assess the interest of replacing fossil raw materials with sustainably sourced bio-based feedstock	Low impact	
EPM	Mandate ecolabelling when products conform to recognized environmental standards	Define product specific metrics to assess and compare under environmental standards and identify recognised environmental standards accordingly. Regulate ecolabelling to prevent greenwashing with robust set of criteria	Low impact	Likely to confuse consumers and will be prone to greenwashing
EPM	Development of sustainable production best practice guidance for multiple actors in the value chain, in and outside of Europe (e.g., water consumption and pollution reduction, manufacturing waste management practices, etc) through an agreed upon and measurable criteria		Low impact	Non regulatory measure

Life cycle stage	Complementary Measures	Including one or a combination of more detailed measures	Justification of exclusion from shortlist	Additional comments
EPM CU EOL	Development of sustainable design best practice guidance for use in and outside of Europe at the manufacturing stage (recyclability, durability, repairability, disassembly) through an agreed upon and measurable criteria for multiple actors in the value chain		Low impact	Non-regulatory measure
EPM CU EOL	Implement minimum biodegradability requirements for microfibres		The measure tackles an important objective, but is problematic from a technical perspective with medium impact	Biodegradability is prone to greenwashing and materials that are harmful in other ways
DR	Optimising textiles delivery and pick up systems to be greener (e.g., sharing economy)		Low impact	Under the remit of local government rather than Member States
DR	Implement minimum energy saving methods in retail spaces		Low impact	The measure would likely require a change for all retail and distribution buildings, which may be difficult to obtain
DR	Impact assessment of 'product-as-a-service' business model in the textiles industry		Low impact	This is the first step related to an objective formulated in the CEAP
EOL	Implement VAT reduction on second-hand products		This measure responds to a necessary objective, is entirely feasible, with high efficiency	Reuse is a fast-growing industry and does not need prioritisation. Also, other measures on durability and repairs will feed into reuse.

Life cycle stage	Complementary Measures	Including one or a combination of more detailed measures	Justification of exclusion from shortlist	Additional comments
EOL	Create clear, ambitious and domestic targets for reuse and preparation for reuse		This measure responds to two necessary objectives, is mostly feasible, with high efficiency	Reuse is a fast-growing industry and does not need prioritisation. Target can also be misleading and lack enforcement.
EOL	Mandate a final sorting stage at sorting facilities for products destined for disposal to ensure synthetic material-based waste is sent for landfill and natural material-based waste is sent for energy recovery.		Sorting technically challenging due to blended fibres	This measure further requires agreement on thresholds for natural and synthetic proportions in blended materials.
EPM	Development of guidance regarding best available technologies/processes regarding sustainable design e.g. resource efficient manufacturing, water use, energy efficiency.	Development of collaborative database of manufacturers utilising BAT for production, low carbon emissions countries/regions of production etc.	Low impact	Non-regulatory measure
FH	Development of guidance regarding best available technologies for optimised raw material yields that are produced sustainably e.g. regenerative farming, soil health protection etc.	Development of collaborative database of farmers utilising BAT for sustainable and optimised raw material yields	Low impact	Non-regulatory measure
EOL	Provide subsidised (through joint government & industry funding) corporate training for actors placing textiles on the national market		Part of EPR communications role	The training topics could be: • environmental, social and animal welfare impacts of the textiles industry, • aims of the textiles circular economy • best practices depending on the industry actor type

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