



mistra  
future  
fashion



# consumer policy recommendations

by  
Kristian Steensen Nielssen  
& Wencke Gwozdz



**Title:** Consumer Policy Recommendations

**Author:** Kristian Steensen Nielsen & Wencke Gwozdz

Mistra Future Fashion deliverable: D.3.2.2.1

Edition: Only available as PDF for individual printing

ISBN: **978-91-89049-47-5**

Mistra Future Fashion report number: 2019:10

© Kristian Steensen Nielsen

Copenhagen Business School Solbjerg Plads 3, DK-2000

Frederiksberg Phone: +45 3815 3815

[www.cbs.dk](http://www.cbs.dk)

Images: Unsplash

Layout: Malin Wennberg

#### **A Mistra Future Fashion Report**

Mistra Future Fashion is a cross-disciplinary research program, initiated and primarily funded by Mistra. It holds a total budget of SEK 110 millions and stretches over 8 years, from 2011 to 2019. It is hosted by RISE in collaboration with 15 research partners and involves more than 50 industry partners.

[www.mistrafuturefashion.com](http://www.mistrafuturefashion.com)



FUNDED BY



The Swedish Foundation for  
Strategic Environmental Research

For additional questions about the research, please contact corresponding author:

Kristian Steensen Nielsen  
Copenhagen Business School, PhD  
[ksn.msc@cbs.dk](mailto:ksn.msc@cbs.dk)

Copenhagen Business School Solbjerg Plads 3, DK-2000  
Frederiksberg Phone: +45 3815 3815  
[www.cbs.dk](http://www.cbs.dk)

# summary

Consumers have a critical role in the necessary sustainable transition of the clothing industry: They decide what clothes to acquire, where to acquire it, how to use it, and how to discard it. Although concerns for environmental impacts induced by clothing production and consumption are becoming increasingly important for consumers, such concerns still only influence consumer choices to a limited extent—warranting new far-reaching initiatives.

In this report, we make policy recommendations showcasing how policy-makers can support consumers in acquiring, utilizing, and discarding clothing in more environmentally friendly ways. To illustrate the wealth of policy instruments available to address the clothing industry's environmental challenges, we begin by describing four categories of policy instruments: *regulatory, economic, information-based, and behavioral*. Examples key instruments are presented within each instrument category.

As each lifecycle phase of acquisition, use and maintenance, and discarding poses a unique set of environmental challenges, and how consumers interact with clothing during each phase varies considerably, we identify five key consumer challenges. The five consumer challenges are: promoting environmentally friendly clothing products, supporting consumers' use of alternative business models, prolonging use, optimizing use-phase handling of clothes, increasing recycling rates, and supporting consumer well-being. For each consumer challenge, we offer recommendations for appropriate policy instruments to address the challenge. Ideally, policy-makers should undertake measures to address all five challenges, as addressing one challenge cannot sufficiently remedy the environmental problems induced by the clothing industry.

# table of content

1. introduction .....	6
2. background .....	7
2.1. acquisition .....	7
2.2. use and maintenance .....	8
2.3. discarding .....	9
3. consumer policy toolbox .....	11
3.1. regulatory instruments .....	11
3.2. economic instruments .....	12
3.3. information-based instruments .....	13
3.4. behavioral instruments .....	14
4. consumer challenges and policy recommendations .....	17
4.1. promoting environmentally friendly clothing products .....	18
4.2. supporting consumers' use of alternative business models .....	20
4.3. prolonging use .....	21
4.4. optimizing use-phase handling of clothes .....	23
4.5. increasing recycling rates .....	24
5. conclusion .....	27
references .....	28

# 1. introduction

Clothing consumption—the activity of acquiring clothing with or without a monetary transaction—can serve multiple functions: physical, protecting the human body against variations in weather; psychological, a significant form of non-verbal communication; cultural, the embodiment and celebration of traditions; and social, a gratifying social activity (Gwozdz, Nielsen, Webb, Gupta, & Gentry, 2018). Not everyone recognizes or attaches equal value to all of clothing's functions beyond the physical component—reflected in the large heterogeneity between people in their interest in clothing and acquisition behavior (Gwozdz, Nielsen, & Müller, 2017)—but all people must acquire clothing occasionally. The dominant way of acquiring clothing is, however, surrounded by substantial social and environmental problems, including child labor, poor working conditions, and pollution of ecosystems.

Clothing sales have nearly doubled globally during the last 15 years (Ellen MacArthur Foundation, 2017; Euromonitor International, 2016)—in great part due to the rise of fast fashion, which has increased the number of yearly collections, lowered the price of clothing, and shortened the use phase. The explosive growth in clothing sales has worsened related environmental problems. Clothing production and consumption are responsible for approximately 4% of the greenhouse gas (GHG) emissions and land use induced by EU households, and the shares are increasing (Ivanova et al., 2016, 2017). Although the GHG emissions induced by clothing are not as profound as other domains (e.g., food or transportation), clothing remains one of the most environmentally impactful consumer goods (Choudhury, 2014). Clothing production is responsible for local environmental problems, such as an excessive water and chemical consumption, and pollution of ecosystems—all to the detriment of surrounding communities, often in developing countries (Weller, 2013).

Successfully addressing the environmental problems associated with clothing production and consumption is multifaceted and requires action by many actors (e.g., consumers, private organizations, and governments). In this report, however, we delimit our focus to consumers and, specifically, how policy measures can assist a sustainable transition of clothing consumption.

Consumers are pivotal actors in the necessary sustainable transition of the clothing industry; they decide what clothes to acquire, where to acquire it, how to use it, and how to discard it. Despite environmental concerns becoming increasingly important for consumers, such considerations only influence consumer choices to a limited extent—warranting new far-reaching initiatives (Gwozdz et al., 2017). The limited influence of environmental considerations can, in part, be explained by prevailing barriers, such as the limited diffusion of environmentally friendly alternatives. Policy-makers have the opportunity to assist consumers and reduce some of the prevailing barriers.

To highlight these opportunities, we make policy recommendations—derived, in part, from earlier deliverables within the ‘User Theme’ of Mistra Future Fashion Phase II—showcasing how policy-makers can support consumers in acquiring, utilizing, and discarding clothing in more environmentally friendly ways. As such, we predominantly focus on policy recommendations pertaining to the last three phases of the lifecycle of clothing: acquisition, use, and discarding. While the production and manufacturing stages are important drivers of environmental problems, and influence the way in which consumers acquire, use, and discard clothing, these two phases can only indirectly be influenced by consumers—primarily through their consumption power. The emphasis is, as a result, on the lifecycle stages where the consumer is the primary actor.

The report is organized as follows: we first present background information on clothing acquisition, use and maintenance, and discarding. Next, we describe four categories of policy instruments, wherein we present examples representatives of each category; finally, we identify five key consumer challenges and make policy recommendations for how these can be addressed.

## **2. background**

In this section, we outline the central aspects surrounding the intersection between clothing consumption and environmental sustainability. We focus on the most central environmental challenges emerging from clothing acquisition, use and maintenance, and discarding, and how they relate to consumers.

### **2.1. acquisition**

The acquisition phase is critical as it interacts with all other lifecycle phases. Consumers have a wealth of acquisition and product options to select from whenever they wish to acquire clothing; how they navigate between these options significantly determine their associated environmental impact. For example, consumers can purchase products made from organic or recycled material, or acquire clothing through alternative means, such as secondhand stores, rental services, swapping markets, or clothing libraries (Nielsen & Gwozdz, 2017; Watson, Gylling, Thörn, 2017). What type of clothing consumers acquire—including its quality—and where they do so can send important signals to producers who respond to consumer demands. Through their acquisition behavior, consumers can induce changes upstream in the supply chain that affect the total environmental impact of clothing products. Alternative business models are emerging globally presenting viable and environmentally friendly alternatives to conventional clothing consumption. These models, however, remain niches on the global market and most consumers still purchase their clothing in conventional stores. Even though the alternative business models have yet to reach the mainstream market, the environmental impacts induced from products on offer in conventional stores also varies extensively (e.g., organic versus conventional cotton). Steering consumers toward environmentally friendly products coupled with efforts to reduce consumption of virgin materials would likewise have important environmental benefits (Roos et al., 2016).

To illustrate the vastness of global clothing consumption: as of 2013, the average consumer purchased 64 clothing items per year with an associated expenditure of \$907 (American Apparel and Footwear Association, 2014) and, in 2015, more than 100 billion clothing items were sold globally (Ellen MacArthur Foundation, 2017; Euromonitor International, 2016). Not all consumers are equally responsible for driving the explosion in clothing consumption: A large study of clothing consumption patterns across four countries showed that consumers differ profoundly in how many items they acquire, where they acquire them, and what materials are preferred (Gwozdz et al., 2017). The study found that the consumer segment with the lowest consumption acquired, on average, just over 4 items during the three-month assessment period; the most consuming segment acquired more than 13 items in the same period. Ironically, the high-consumption segment was found to purchase clothing in the most environmentally friendly way (based on the Environmental Apparel Scale; Kim & Damhorst, 1998). Most studies—including Gwozdz and colleagues—do, however, suggest that the majority of consumers still do not link their clothing consumption to environmental problems and degradation (e.g., Kozar & Hiller Connel, 2013). Combined, these results not only highlight the heterogeneity of consumers' acquisition behavior but also suggest the important role of consumer policy in driving environmentally significant change.

## 2.2. use and maintenance

How clothes are handled by consumers during the use and maintenance phase have important environmental implications—particularly resulting from the energy consumption associated with washing and drying (Allwood et al., 2006; Bey, Birkved, Gwozdz, Nielsen, & Müller, 2018). Especially dryers—representing a convenient and quick method of drying clothing—is an energy-intensive activity that consumes 3–4 times the energy of washing at 40 °C (Roos et al., 2017). The frequency of washing and the optional use of dryers also directly influence the durability of clothes. Excessive use of dryers can significantly shorten the technical service life of clothes (i.e., how long it can functionally be worn), which, in turn, can stimulate further consumption. An obvious precondition for dryer use is the ownership of a dryer. Dryer ownership varies greatly around the world—for example, 16% of Polish households own a dryer compared to 83% of American households (Schmitz & Stamminger, 2014; Siebens, 2011). Replacing an old dryer with a new and energy-efficient dryer can offset some of the associated energy consumption, although the new dryer's indirect emissions should not be ignored. The same is true of washing machines where modern washing machines not only have significantly improved its energy-efficiency but also offer a wider range of settings that allow for washing at lower temperatures—further supported by innovations in washing powder.




## 2.3. discarding

A natural consequence following the increase in clothing sales is a simultaneous increase in clothing waste. Clothing utilization—the number of times a clothing item is worn before being discarded—has decreased worldwide by 36% during the last 15 years (Ellen MacArthur Foundation, 2017), resulting in an increased generation of clothing waste. In 2014, 16 million tons of textile and clothing waste were generated in the United States, 64.5% of which was sent to landfills with only 16.2% recycled (United States Environmental Protection Agency, 2016).

Deciding how to discard unwanted clothes have considerable environmental ramifications. The Waste Framework Directive introduced in the European Union (Directive 2008/98/EC; European Commission, 2008) provides a clear and hierarchical guidance for waste handling: waste prevention and reuse should be prioritized over recycling. This framework implies that better utilizing existing clothes should receive the highest priority. But as some clothes will inevitably be discarded, maintaining the products' functional properties should also be a key priority.

Consumers can prolong unwanted clothing products' life by donating to friends, relatives, or charities; using take-back systems in specific clothing stores; or through municipal/city recycling programs. Maintaining clothes' functional properties limits the energy and chemical inputs required to ensure further use (Sandin & Peters, 2018). By comparison, mechanical or chemical recycling either reduces the functional properties of clothes, or demands significant chemical and energy inputs (Trash-2-Cash, personal communication, 2018). The least favorable option is discarding clothing at landfills, leaving only the option of recovering energy from its incineration.

An aerial, high-angle photograph of a busy city intersection. Several cars are visible, including a white sedan, an orange car, and a black car. The intersection features white-striped crosswalks and a central traffic island. In the background, modern buildings with large glass windows are visible, one of which has the word 'BALLOON' on its facade. The overall scene is captured in a slightly desaturated, high-angle perspective.

**'communicating what most  
other people do is one of the  
most effective ways of  
promoting a behavior.'**

## 3. consumer policy toolbox

Policy is designed to provide a range of net social benefits, for example to formalize societies' rules about how people and institutions should behave, to manage public risk, to address market failures and to protect ecosystems from harm caused by human activities (Taylor et al., 2012). There is a wide range of policy instruments, with varying degrees of effectiveness and coerciveness: stronger instruments enable policy-makers to push behavior through coercive measures including laws, pricing, and infrastructure; softer tools pull consumers through non-coercive instruments such as information campaigns and social marketing (Scholl et al., 2013). Often a mix of stronger and softer policy instruments is used to achieve policy objectives in the most effective way, while minimizing costs to businesses and individuals, and to maximize policy acceptability with the public and influential institutions.

In what follows, we describe four categories of (consumer) policy instruments: regulatory, economic, information-based, and behavioral. We present selected examples within each instrument category. It is important to underline that the ambition of this section is not to provide an exhaustive list of all existing policy instruments, but rather to present a selective few that epitomize the instruments available.

### 3.1. regulatory instruments

Regulatory instruments are direct “command and control” tools which impose “mandatory obligations or restrictions on the behavior of firms or individuals” (Taylor et al., 2012, p. 274). These include elements such as product and substance bans, emissions limits, production process standards, minimum product performance standards, mandatory environmental reporting for companies, mandatory green public procurement standards and building codes. Regulation may also include Extended Producer Responsibility schemes (e.g., take back obligations; see Elander, Tojo, Tekie, & Henlock, 2017) and Green Public Procurement, whereby public authorities take account of environmental factors when procuring products, services or works. These instruments aim at determining which products, services, substances and production methods should be allowed and further establish specific requirements for actors.

As regulatory instruments enforce behavior through law, they tend to have the highest level of effectiveness; it is also relatively inexpensive for governments to set targets and standards, and the goals for policy achievement are clear (UNEP, 2015). Regulatory policy tools directly remove unsustainable products from the market, and thus have a direct impact on consumption patterns (OECD, 2008), for example, in improving efficiency of domestic appliances (Jackson & Michaelis, 2003).

Regulatory instruments have made significant contributions to improving consumer products and technologies, and lower consumer-induced environmental impacts, for example through minimum standards for vehicle emissions; however, “the stringency of policies is limited by government unwillingness to challenge industry.” (Jackson & Michaelis, 2003: 58). Implementing direct regulation sends a powerful, clear signal to market actors of government commitment; for example, a number of governments recently committed to phase out petrol and diesel cars, sending a strong signal to the industry (Asthana & Taylor, 2017). Direct regulation has, however,

been criticized for limiting business innovation to find the best solutions to an environmental problem, and in some cases monitoring and enforcement may be resource-intensive, so regulation is usually used only for the highest risks; in addition, direct regulation may not always be the most appropriate option, or may be just one part of a package of policy interventions (Taylor et al., 2012).

#### **Restrictions and bans**

To ensure environmental protection, the most environmentally harmful product and service options can be removed from choice by implementing and enforcing restrictions and bans. Protecting worker and consumers alike, the EU implemented the REACH legislation (EC1907/2006) which restricts the use of harmful chemicals during production and processing. Advertising for harmful choices can also be banned or restricted, as a way of reducing promotion of unsustainable options. Bans ensure that consumers are not made responsible for choosing to avoid harmful products.

#### **Standards**

Standards can be defined as “published documents setting out specifications and procedures designed to ensure products, services, and systems are safe, reliable, and consistently perform the way they were intended to” (OECD, 2010). Environmental standards can provide assured levels of environmental protection in, for example, supply chains, thus reducing the complexity of consumer choices. Environmental quality standards specify a minimum desired level of environmental quality, or the maximum level of pollution, for example urban air quality. Technical standards specify either mandatory technical equipment to be used, such as requiring cars to be fitted with catalytic converters, or maximum levels of emissions or resource consumption for specific products or systems, such as maximum emissions values for vehicles (UNEP, 2015). Environmental standards can, however, also be instituted and enforced by private and non-governmental organizations, such as the Roundtable for Sustainable Palm Oil or Marine Stewardship Council (Vandenbergh, 2006).

#### **Green Public Procurement**

Green Public Procurement (GPP) means that public authorities take account of environmental factors when procuring products, services or works. It may result in direct environmental improvements, as well as in strengthening markets for more environmentally friendly products and services; stimulating innovation; providing economic savings from energy-efficient products; and changing social norms through increasing awareness of environmentally friendly options and through leading by example. GPP is an effective approach to promote sustainable consumption: governments have significant power to influence markets towards sustainability through the quantity of their purchases while providing good sustainable consumption examples for their citizens (OECD 2008).

## **3.2. economic instruments**

Economic instruments change the financial incentives for individuals and businesses, encouraging them to voluntarily change their behavior. These include instruments such as fees and charges, taxes and subsidies, cap-and-trade schemes, feed-in tariffs, tradable permits,

deposit-refund systems, etc. Economic instruments can serve different aims including internalizing external costs, reaching policy targets for pollution reductions, or promoting specific technologies and can significantly influence consumption by increasing or reducing supply and/or demand for specific products and services. They are generally less effective than regulation because behavior change is voluntarily, although strongly encouraged. In some cases, economic instruments for environmental change may be unpopular and viewed as “stealth taxes” (Taylor et al., 2012), although they may also positively influence social norms.

#### **Taxes and subsidies**

Taxes and subsidies influence the market by changing the prices of goods and services, which in turn alter supply and demand for specific goods and technologies. Application of environmental taxes plays a central role in the effort to implement the “polluters pay” principle, a key principle in European environmental policies. Environmental taxes are often implemented in the form of a revenue-neutral tax reform by transferring taxes from labor to natural resources and environmental impacts. Taxes may be on raw materials, aiming to influence production, or on products, aiming to influence consumption. Evidence on the environmental effectiveness of taxes is broadly positive; in general, they work when the tax is sufficiently high to stimulate measures to abate pollution levels and is seen as a dynamic incentive to reduce pollution, GHG emissions, or natural resource use.

#### **Tradable permits**

Tradable rights systems specify a quantity of permits—such as permits to emit carbon—which are then traded amongst users and can be used to achieve an environmental target, such as a GHG emissions reduction (UNEP, 2015). These systems are designed to create an opportunity costs of using an allowance, which then also creates benefits from not using an allowance (Taylor et al., 2012). Tradeable permits, such as the European Emission Trading Scheme (ETS) or the fish quotas, can be a powerful tool for delivering environmental objectives in a cost-effective way, but the instrument design and implementation protocols are crucial to success. The main advantage of emissions trading is that it facilitates and encourages abatement to take place wherever it is cheapest to do so.

### **3.3. information-based instruments**

Information-based instruments include labelling, consumer guidelines, consumer campaigns, websites and portals, education on sustainable consumption and training seminars for authorities and/or the private sector—all aimed at raising awareness about sustainable consumption and enabling consumers to make environmentally friendly decisions. Such instruments can be a key driver in expanding the markets for environmentally friendly products (e.g., organic products or eco-labelled products). Communication and information tools are frequently used when promoting sustainable consumption, in order to inform consumers (including the private sector, public administration and individual citizens) about the environmental impacts of their behavior, and try to persuade them to consume more responsibly. Informational instruments are rarely evaluated in terms of measurable behavior change—usually evaluations rely on “raising awareness” or self-report of intention to act. When such instruments are fully evaluated, evidence over several decades shows that raising awareness on its own does not lead to a corresponding change in behavior (Jackson & Michaelis, 2003). Information instruments work best when combined with other policy tools, such as economic incentives, and when informing about new possibilities, such as changes in infrastructure that facilitate

sustainable behavior. Information can also be used in more targeted and more creative projects, for example, information about how energy efficient a household is compared to other households on the street, in combination with energy bills (Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007).

#### **Targeted information provision**

Information and training are made available to facilitate better-informed decision making. Effectiveness of this approach is enhanced when the targeted group has both the capacity and willingness to change their behavior, and when the information comes from a source that is perceived as trustworthy (Gouldson et al., 2008). Even when information does not result in behavior change, it can help to build awareness and positive attitudes towards issues, which can then increase acceptability for stronger policy measures, such as regulation and economic instruments.

#### **Naming and shaming / framing**

Making information about environmental performance of businesses publicly available is an instrument seeking to encourage businesses to improve their performance in order to avoid reputational damage. The published information can be used by engaged consumers to inform their decision-making; non-governmental organizations may use the information to target poor performing companies; and well-performing companies can use the information for promotional purposes. The instruments' effectiveness may, however, be less effective for small companies who oftentimes receive less scrutiny than larger companies (Gouldson et al., 2008).

#### **Labeling and certification**

Labeling and certification schemes can assist consumer decision-making by facilitating product comparisons, reducing search costs, and providing environmental protection assurances. Consumers are able to choose products with better environmental performance by using information provided on standardized product labels (e.g., EU Ecolabel or GOTS). Labeling schemes can have the advantage of pushing standards higher, as businesses improve their environmental performance in order to gain the benefits of certification (Gouldson et al., 2008). The functionality of labels does, however, rely on consumers integrating environmental considerations in their purchasing decision. The label's design and position similarly affect its functionality and effectiveness (Thøgersen, Haugaard, & Olesen, 2010; Thøgersen & Nielsen, 2016). Establishing consumer trust in environmental labels are critical, and can be enhanced by ensuring certification through a trusted authority: this could be an NGO or political institution, depending on the country. In the Nordic context, governments are usually the most trusted authority for providing environmental certification schemes (Thøgersen & Nielsen, 2016).

## **3.4. behavioral instruments**

Behavioral instruments move beyond the implicit assumption in most information-based instruments that consumers are rational agents motivated by self-interest and set out to maximize their own welfare, and gifted with the cognitive abilities to undertake accurate cost-benefits analyses of any given action (OECD, 2010; Ölander & Thøgersen, 2014; Reisch & Zhao, 2017). Instead, behavioral instruments incorporate scientific knowledge accumulated in behavioral science, including research on biases, habits, and norms. An instrument rapidly growing in popularity is nudging. Nudging involves using better choice architecture to "nudge"

consumer choices, for example, by placing eco-labeled products at a shop entrance or next to the cashier. Nudging directs people towards certain behaviors while allowing freedom of choice. Other behavioral approaches include communicating norms, simplifying complex information, default setting, and habit interventions. Behavioral instruments differ in their visibility to consumers (e.g., consumers may not notice a change in choice architecture) and their applicability to change simple versus complex behaviors.

### **Default options**

A default is the condition imposed when a consumer fails to make a decision or the option received if they do not explicitly request something different (Johnson & Goldstein, 2003; Brown & Krishna, 2004). There are two types of defaults: opt-out and opt-in. Opt-out defaults require the consumer to actively remove themselves from the condition/option if they do not wish to participate; with opt-in defaults consumers must themselves sign-up if they wish to participate. Defaults are powerful; sticking with the default saves time, effort, and money and sends a signal to the receiver that the default was likely specified based on sound reasoning. The best example of the powers of defaults is organ donation. A well-known study from 2003 observed consent rates for organ donation depending on the chosen default: countries with an opt-out policy (e.g., 99% consent rate in Austria) had a significantly higher number of organ donors than countries with an opt-in policy (12% consent rate in Germany; Johnson & Goldstein, 2003). Evidence also suggests an effect of defaults in the environmental domain. For example, a German study found that setting an opt-out default to automatic enrollment to green energy resulted in a 10-fold increase in green power contracts (Ebeling & Lotz, 2015).

### **Communicate a norm**

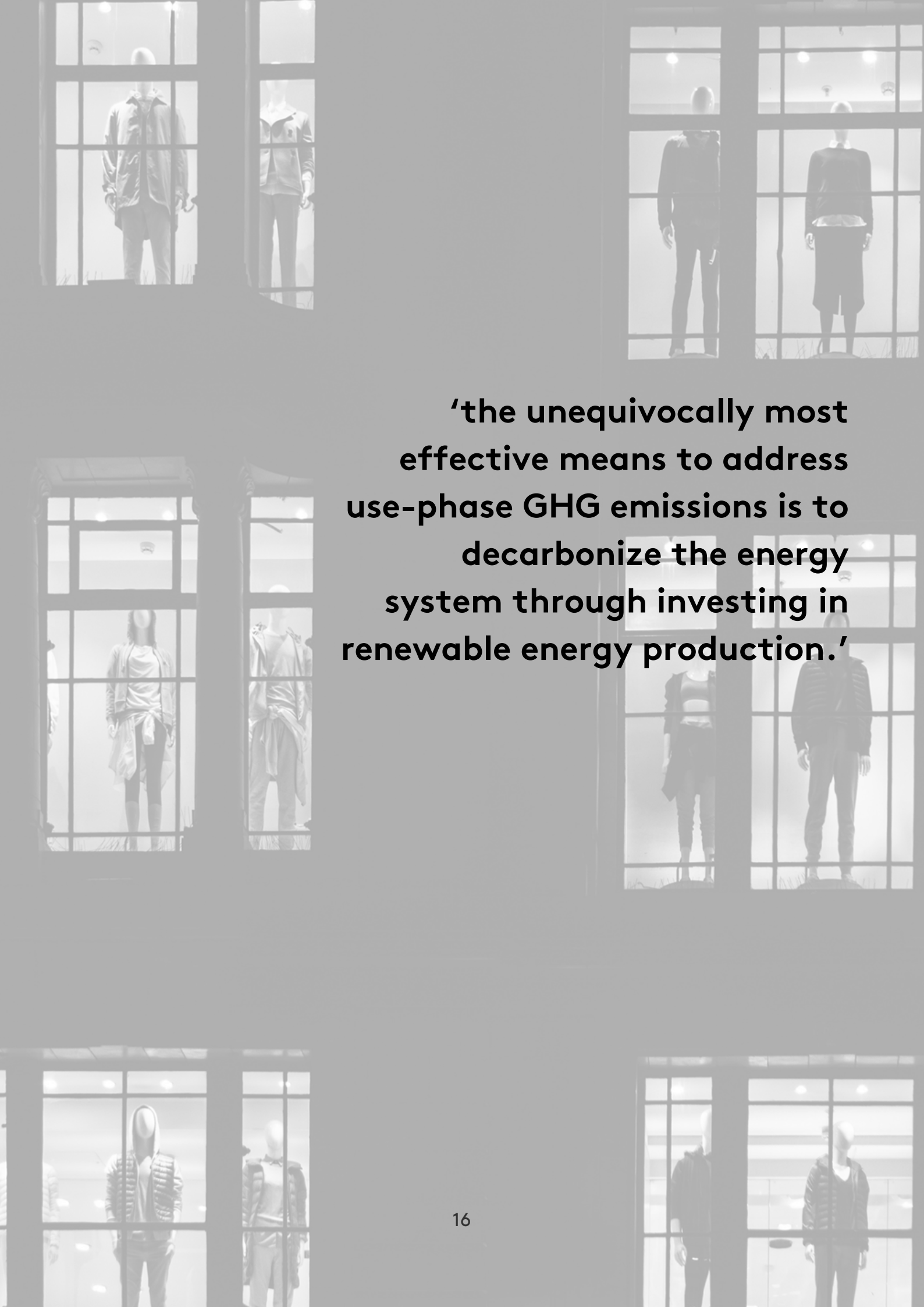
Communicating what most other people do is one of the most effective ways of promoting a behavior. When the information is local and specific it is even more powerful, for example “nine out of ten guests in this hotel reuse their towels” (Goldstein, Cialdini, & Griskevicius, 2008). Using descriptive norms (what most people do) in this way has proved effective in reducing a variety of undesired behavior (Biel & Thøgersen, 2007). But if most people are engaging in undesired behavior it is more effective to emphasize the injunctive norm (what most people think people should do). Recent evidence also suggests that communicating the dynamic change of a norm can influence consumer behavior (Sparkman & Walton, 2017).

### **Increased ease and convenience**

Making environmentally friendly options more visible, affordable, accessible and/or enjoyable increases the probability that consumers choose them. Reducing barriers to environmentally friendly choices, including reducing the time it takes to understand what to do, helps to overcome resistance to change, and reduces skepticism and perceived difficulty or ambiguity (Sunstein, 2014).

### **Breaking habits**

Consumers are busy, overloaded with information in choice environments, and demanded to make numerous decisions each day—reducing the likelihood of making deliberate, carefully planned consumer choices every time. As a consequence, consumers often make choices out of habit. Research has shown that an effective way to break well-established habits is to utilize transition phases (Wood, Tam, & Witt, 2005; Verplanken & Wood, 2006). A transition phase could, for example, be during home moves where consumers are forced to form new habits due to an unfamiliarity with the new physical environment. During transition phases, consumers are more receptive to information and appeals than they otherwise would be.



**'the unequivocally most effective means to address use-phase GHG emissions is to decarbonize the energy system through investing in renewable energy production.'**



## 4. consumer challenges and policy recommendations

Addressing the environmental problems associated with clothing requires extensive measures in all lifecycle phases. Given this report's focus on clothing acquisition, use and maintenance, and discarding, we identify five key consumer challenges that are critical to reducing the environmental impacts induced by clothing consumption. For each consumer challenge, we offer recommendations for appropriate policy instruments to address the challenge. Ideally, policy-makers should undertake measures to address all five challenges, as addressing one challenge cannot sufficiently remedy the environmental problems induced by the clothing industry. In cases where a full implementation is not politically feasible, attention should be paid to the challenges, and associated policy instruments, that offer the greatest environmental impact reductions.

We recognize that political feasibility is not a fixed entity and fluctuate across time and context; as such, policy-makers should select the policy instruments that are most feasible in their context (although not disregard the environmental implications). Due to this report's limited scope, we cannot unfold all sub-challenges relating to each challenge; instead, we select what we deem the most important aspects. The proposed policy instruments are also not an exhaustive list, and should be complemented by other, context-sensitive, instruments as well. The five consumer challenges—largely derived from earlier deliverables in Mistra Future Fashion Phase II—are: promoting environmentally friendly clothing products, supporting consumers' use of alternative business models, prolonging use, optimizing use-phase handling of clothes, increasing recycling rates, and supporting consumer well-being.

table 1 Overview of policy recommendations

Consumer challenge	Policy recommendation	Impact
Promoting environmentally friendly clothing products	Environmental label	High
	Information tool with rules-of-thumb	Low - Medium
Supporting consumers' use of alternative business models	Mapping alternative business models	Low - Medium
	Increase consumer exposure through rent support	Medium
Prolonging use	Carbon tax	High
	Mandatory durability disclosure	Medium
	Mandatory repair services	Medium
Optimizing use-phase handling of clothes	Information campaign to reduce washing and dryer usage	Low
	Investment in renewable energy infrastructure	High
	Default setting to support renewable energy	High
Increasing recycling rates	Mandatory take-back systems	Medium
	Remove VAT	Medium

## 4.1. promoting environmentally friendly clothing products

When consumers make product decisions (in conventional stores) little to no information is available on the products' environmental impact or the manufacturing, production, and distribution processes involved. This information asymmetry hinders consumers from making rational decisions based on environmental performance. Although notable environmental labeling schemes exist, these have not experienced the same adoption rate among consumers, as environmental labels in other consumption domains (e.g., organic food labels; Iwanow et al., 2005)—for good reasons. First, there is only limited availability of national and international labelling schemes in the fashion context and these have not been around as long as labels, for example, in the food context. Second, label schemes, such as Better Cotton Initiative (BCI) and Global Organic Textile Standard (GOTS), are useful initiatives but require that consumers are knowledgeable about the certification schemes before entering the store. Also, the voluntary

nature of most labelling schemes is another barrier caused by the lack of trust and monitoring by external actors (Iwanow et al., 2005). The limited ability to dissect clothing products' environmental performance in-store means that consumers are instead forced to rely on rules-of-thumb inferences of environmentally preferable fabrics (e.g., organic cotton), known brands that emphasize environmental protection, country of origin, or certified product labels (whose standards they are unaware of). The lack of environmental information also has the consequence that consumers without strong environmental concerns are rarely primed to think about environmental factors in moments of decision-making. This reduces the likelihood that larger consumer segments incorporate environmental considerations in their decision-making, which could by implication, negatively influence the sales of environmentally friendly clothing products.

#### **Recommendation: Environmental label**

A trustworthy environmental label allows consumers to quickly determine a clothing product's environmental impact in the moment of decision-making. The design of a label, and the information it conveys, are critical determinants of its success in influence product choices and, as a consequence, reducing environmental impacts (Thøgersen, Haugaard, & Olesen, 2010). According to Thøgersen (2000), the success of an environmental label depends on whether consumers notice, understands, trust, and values the label. Bearing this in mind, we recommend developing and introducing an environmental label that integrates a color-ranking scheme similar to the successful EU energy label (for further discussion of label design and ranking system: Grankvist, Dahlstrand, & Biel, 2004; Van Dam & De Jonge, 2014; Thøgersen & Nielsen, 2016). Ideally, the label would rank clothing products based on an overall environmental assessment (e.g., a meta-score) that reflects their environmental performance across multiple impact categories (e.g., GHG emission, ecotoxicity, water consumption, etc.). However, due to the expected cost of gathering such comprehensive information, we recommend focusing the label on GHG emissions, which is the most critical component in mitigating climate change (see Vandenbergh, Dietz, & Stern, 2011).



Communicating a product's GHG emission (indicated in CO<sub>2</sub>-equivalents) allows for between-product comparison, and the label's coloring scheme eases the task of comparing products. To ensure trust in the label, we recommend a strong international public institution (e.g., European Union) or private governance coalition (similar to the Marine Stewardship Council) as the responsible agent for the labeling scheme.

Examples: EU Energy Label and Carbon Trust.

#### **Recommendation: Environmental information tool with rules-of-thumb**

Global supply chains are intricate and not transparent to the consumer. The production of clothing is no exception. Consumers are rarely informed of the large number of processes involved in producing clothing products—including manufacturing the fabric, knitting or weaving, dyeing and coloring, and shipping to stores—and the environmental impact each process induces. For example, today's clothes are made from a wealth of different fabrics, including polyester, cotton, nylon, wool, or silk. Navigating the different fabrics, and the associated environmental impacts, is a challenging task for most consumers. Thus, the complexity and lack of transparency of clothing production makes it extremely difficult for consumers to make accurate inferences about which products should be preferred from an environmental perspective. The optimal solution for this information asymmetry is an environmental label, but as this might not be feasible in all contexts, an information tool is an alternative solution. We recommend that the tool presents simple information about the most important lifecycle phases in determining a product's environmental impact (e.g., whether it is the fabric or the length of transportation). This information should ideally convey simple rules-of-thumb on how to identify the most environmentally friendly products, permitting consumers to more easily integrate them into their decision process. The information tool should preferably be an app in order to make the information accessible in the moment when consumers make product choices.

## **4.2. supporting consumers' use of alternative business models**

Alternative business models—including fashion leasing, clothing libraries, and swapping markets—are currently a niche on the global clothing market and has yet to challenge conventional clothing consumption. The missing diffusion of alternative business models can, amongst other, be attributed three factors: limited availability, lack of consumer knowledge of the business models, and resilient perceptions of clothing consumption. Alternative business models have predominantly emerged in specific neighborhoods in larger cities, and have struggled to branch out—in part due to financial constraints and challenges (Pedersen & Netter, 2015; see also Watson et al., 2017). For example, Nielsen and Gwozdz (2017) found in a study of consumers' acceptance of alternative business models that the vast majority of consumers have not used business models, such as clothing libraries and fashion leasing (4.7% and 3.8% of respondents reported past use, respectively). The low availability of alternative business models also means that most consumers are unfamiliar with their services—and even if familiar with them, their limited dispersion may render them inconvenient.

The last, and arguably most important, challenge is consumers' willingness to use alternative business models should they be available. The study by Nielsen and Gwozdz (2017) found that the majority of consumers were unlikely to use any of the eight assessed business model in the

future (with the exception of traditional repair service). While a discouraging finding, the study's respondents were not presented with information describing the business models, and some may therefore have been unfamiliar with their services. The finding may, however, also reflect consumers' resilient perceptions of what constitutes clothing consumption, the limited appeal of alternative business models, or simply a profound enjoyment emerging from the activity of acquiring new clothing. Although future research is needed to explore these explanations empirically, there are nevertheless a number of policy initiatives that could be implemented to encourage the use of alternative business models (see Watson et al., 2017, for a business perspective).

#### **Recommendation: Mapping alternative business models**

Research on alternative clothing businesses highlight the importance of achieving a secure revenue stream for long-term survival (Pedersen & Netter, 2015). Many alternative businesses struggle to achieve this economic stability, and either incur economic losses or break-even with voluntary work (Elander, Watson, & Gylling, 2017). Due to their restrained financial capability, these businesses cannot afford to undertake extensive marketing campaigns to promote their services to consumers—reducing the likelihood of obtaining a large customer base. A small initiative is to establish a service (e.g., app or website) that lets consumers identify and locate alternative business models in or around their city. The service should also provide descriptions of each business and, if available, link to their website.

Example: [Go Green Copenhagen](#).

#### **Recommendation: Increase consumer exposure through rent support**

One explanation for the limited success of alternative business models, such as fashion leasing or clothing libraries, is that they are not located in close vicinity to the high street or in shopping malls—or, in other words, where the majority of consumers shop for clothing. Many consumers will, as a result, never be exposed to alternative businesses' services. Their rare presence in central locations is predominantly a financial issue. To overcome this barrier, we recommend that policy-makers establish programs that offer free rental spaces in central locations for a limited period (e.g., a year). The financial program could help stimulate the growth of these alternative businesses, as consumers do not have to change their shopping routines, but can become acquainted with the alternative business models without actively seeking them out. A related, but less costly, option is to offer affordable loans with a low interest rate, which would limit the financial burden involved, and achieve a similar expected outcome.

## **4.3. prolonging use**

The near doubling of clothing sales (in number of items sold) over the last 15 years is in direct collision with ambitions to limit the increase in global average temperature to below 2°C—as adopted in the Paris Agreement—and to mitigate the worst consequences of climate change (IPCC, 2018). National governments are required, as per the Paris Agreement, to deliver deep cuts to GHG emissions, and the clothing industry—being a significant contributor to global GHG emissions—are unlikely to avoid emission reduction requirements. The most effective strategy to reduce GHG emissions, and other environmental impacts, from clothing consumption is by reducing sales of new clothing products and prolonging the use of existing clothes (Roos et al., 2016). Options for prolonging use are plentiful and include: improving material quality, redesign, repair, and wardrobe utilization.

There is great potential for prolonging use, at least from a technical service perspective, with clothing utilization having decreased to a point where clothes are typically discarded well-before losing its material functionality (Ellen MacArthur Foundation, 2017). One method for prolonging use is to improve the material quality of clothing products by designing for durability. A logical consequence of improving quality is a corresponding price increase. Although large consumer segments have become accustomed to low prices, raising prices have notable advantages: less significant economic implications for companies, limited environmental rebound effects from reducing consumption (i.e., less money is freed up to spend on other GHG intensive activities; see Bjelle, Steen-Olsen, & Wood, 2018), stimulate alternative business models—including secondhand stores, clothing libraries, and fashion leasing—by making them more economically attractive, and promote reuse and sharing. Another opportunity for prolonging use is to redesign existing clothes to accommodate shifts in consumer preferences—a service that could be integrated in conventional stores and thus be a new revenue stream. As most clothes inescapably lose their practical and/or technical functionality, repair services can help restore functionality and postpone the need to replace clothes. Research suggests that consumers actively use less than half of their possessed clothing and often forgot the diversity of clothes owned (Choo et al., 2014); as a result, promoting techniques to greater utilize consumers' wardrobes can offset new clothing acquisitions.

#### **Recommendation: Carbon tax**

A strong measure to reduce global GHG emissions is to introduce a carbon tax (Baranzini et al., 2017; Pezzey & Jotzo, 2013). Taxing carbon emissions has the advantage of establishing a stable price that reduces risk for companies to undertake long-term efforts to reduce their GHG emissions. Furthermore, the introduction of a carbon tax would (in all the likelihood) increase the price of new clothing products, and particularly the GHG-intensive products, which could incentivize reducing consumption and/or promote the use of alternative business models. A carbon tax's design and the instituted price on carbon are, however, critical components to ensure it reaches its environmental ambitions without undermining social justice and economic livelihood (Klenert et al., 2018).

#### **Recommendation: Mandatory durability disclosure**

A subtle measure to counteract the decrease in clothing utilization is to introduce a mandatory durability disclosure, wherein manufacturers specify the expected durability and technical functionality of a clothing product under assumptions of normal wear and tear. The durability information provides consumers with a heuristic of appropriate usage before discarding, but more importantly, it also allows consumers to make product-comparisons based on durability, which might induce manufacturers to improve their products' durability and quality.

#### **Recommendation: Mandatory repair services**

Clothes are often discarded due to minor material malfunctions causing reductions in perceived value and functionality of the item. However, in most cases, these malfunctions are repairable—making it possible to restore a product's loss of value and functionality and, in turn, prolong its use. The availability of repair shops or tailors significantly declined with the rise of fast fashion. But slowly, these services are re-emerging and some clothing stores even offer in-store repair services (e.g., Nudie Jeans). We recommend policy-makers to stimulate this re-emergence by making repair services mandatory for companies and/or clothing stores of a certain size. The legislation should permit companies to charge a service fee as economic compensation for the (expected) loss of sales, although the service would ideally be free of charge for consumers.

*Examples: [Nudie Jeans](#) and [Patagonia](#).*

## 4.4. optimizing use-phase handling of clothes

An often forgotten contributor to clothing-induced environmental impacts is the use phase. How consumers use and maintain their clothing have significant implications for the associated GHG emissions (Bey et al., 2018). Research suggests that there is high variability in how often people wash, at what temperature they wash, and whether a dryer is used—indicating the feasibility of changing use and maintenance behaviors (Gwozdz et al., 2017). Determining what use-phase behaviors to target depends on the context, which interacts with the induced environmental impact. For example, the importance of dryer avoidance is determined by the source of electricity; thus, avoiding dryers is more important in contexts where the electricity comes from fossil fuels (e.g., Poland) than when it comes from renewable energy sources (e.g., Norway). The same issue applies to washing behaviors, although washing has an added impact from water consumption. Policy-makers have several opportunities to address use-phase behaviors—both directly and indirectly. We highlight the most noteworthy below.

### **Recommendation: Information campaign to reduce washing and dryer usage**

Policy-makers can undertake efforts to alter consumers' washing and drying behavior through information provision and communicating a dynamic norm (e.g., an increasing number of households dry their clothes without using a dryer). The information should communicate the benefits of reducing washing and dryer usage: lower energy consumption and GHG emissions, protection of clothes, and economic savings. We recommend that the information campaign is targeted towards households with, or who are likely to have, a dryer and, ideally, households with the option of line-drying clothes (e.g., house owners). The campaign should also target households living in areas with a GHG intensive energy supply in order to maximize the environmental benefits. The information campaign could incorporate a dynamic norm message stating that the norm is shifting away from dryer use (note: the communicated norm should be evidence-based). Research has shown that a dynamic norm can be a powerful motivator to induce behavior change (Sparkman & Walton, 2017).

### **Recommendation: Investment in renewable energy infrastructure**

The unequivocally most effective means to address use-phase GHG emissions is to decarbonize the energy system through investing in renewable energy production. By reducing the GHG-intensity of the energy system, households are less required to change their use-phase behaviors, as their electricity consumption would induce less GHG emissions. Transitioning the energy system towards renewable energy production is a critical component of mitigating climate change and will benefit across sectors.

*Example: Norway.*

### **Recommendation: Default setting to support renewable energy**

Another method for stimulating the transition to renewable energy production—and by implication the GHG-intensity of washing and drying—is to set energy contracts to deliver renewable energy by default. The default should be an opt-out, thus still permitting consumers to freely opt-in to a conventional, and often cheaper, energy contract. Despite the fact that renewable energy contracts often come at a price premium, reversing the default has been shown to be a powerful method for overcoming the price barrier, and thus promote renewable energy (Ebeling & Lotz, 2015). The default is context-sensitive and can be implemented by actors

other than public institutions, including utility companies, depending on who is responsible for the energy supply to households. The advantages of reducing the energy grid's GHG-intensity through reversing the default are: (1) immediate GHG emissions reductions from use-phase behaviors; (2) widespread implications for consumers' carbon footprint; and (3) limited to no expected rebound effect (i.e., displacement of GHG emissions from one domain to another; see Bjelle et al., 2018).

*Example:* Schönaau, Germany (Pichert & Katsikopoulos, 2008)

## 4.5. increasing recycling rates

Recycling should ideally only be undertaken when other waste prevention measures—including redesign, reuse, and repair—are infeasible; as such, the importance of increased recycling efforts depends on the success of promoting alternative business models and prolonged use. Most clothes will nevertheless reach its end-of-life at some point, legitimizing the need for recycling. This need is further amplified by the large percentage of discarding clothing being sent to landfill—often without energy recovery (United States Environmental Protection Agency, 2016). But despite recycling's environmental legitimacy, recycling clothing is a complex process (see Mistra Future Fashion's 'Recycling Theme': [http://mistrafuturefashion.com/what-we-do/#theme\\_4](http://mistrafuturefashion.com/what-we-do/#theme_4)).

The two methods of recycling clothing—mechanical and chemical recycling—each have their unique challenges. Mechanical recycling—the currently most available method of clothing recycling—can mechanically defibrate clothes into fibers, which are then be spun—with or without adding virgin fibers—into yarns for clothing production (de la Motte & Palme, 2018). However, mechanical recycling primarily produces fibers of inferior quality compared to virgin fibers and research is lacking on how consumers respond to this loss of quality. Chemical recycling can, by contrast, regenerate fibers of high quality through chemical processing. But this process is intricate due to the vast production of blend-fiber clothes, and no large-scale chemical recycling plants currently exist on the market (de la Motte & Palme, 2018). Setting aside these challenges, there are a number of options for policy-makers to help increase recycling rates—including ensuring that consumers make unwanted clothing available for recycling as well as consumers' interest in acquiring recycled clothing. We elaborate on the most prominent options below.

### **Recommendation: Mandatory take-back systems**

The options for responsibly discarding clothing are, in many countries, limited and typically require significant motivation to do (e.g., finding a nearby clothing container or secondhand store). The lack of discarding convenience results in larger amounts of clothing ending up as landfill, thus preventing reuse or recycling. A number of clothing stores have addressed this by establishing in-store take-back systems, which lets consumers drop off their unwanted clothes while shopping (Hvass, 2015). The in-store take-back systems can ease the task of recycling clothing by making such facilities more accessible. We recommend instituting a mandatory requirement for clothing stores over a certain size to offer in-store take-back. The companies who have already established take-back systems have incentivized consumers' to use the facilities by rewarding them with discount vouchers (e.g., H&M). While this incentive can encourage proper discarding, it simultaneously promotes more consumption, risking to offset the environmental benefits. We recommend, instead of discount vouchers, that the service is



non-incentivized to prevent offsetting further consumption and that the focus is directed towards other, preferably non-monetary, incentive schemes.

*Example: H&M, Jack & Jones, Puma, Mark & Spencer.*

**Recommendation: Remove VAT**

The challenge of increasing clothing recycling is two-fold: (1) consumers must make their clothing available for recycling, and (2) consumers must acquire clothing products made from recycled materials. To address the latter challenge, we recommend removing VAT for all clothing products made from recycled materials. Recycled clothing often comes at a price premium and/or of lower quality (depending on the recycling method); removing VAT can make recycled products more competitive and accessible to larger consumer segments.

**'despite consumers' important  
role in a sustainable transition,  
it is critical not to become  
blindsided and disregard  
initiatives targeting earlier  
lifecycle phases.'**



## 5. conclusion

The environmental impacts induced by the global clothing industry are profound and growing, warranting fundamental changes to how consumers acquire, use, and discard clothing. Consumers are important actors in a sustainable transition of the clothing industry, as they determine which products are demanded, how they are used and maintained, and the manner in which they are discarded when they are no longer wanted. Each lifecycle phase of acquisition, use and maintenance, and discarding poses a unique set of environmental challenges, and how consumers interact with clothing during each phase varies considerably. As a result, we identified five key consumer challenges that are essential for reducing environmental impacts. Addressing these challenges demands the implementation of far-reaching initiatives (e.g., carbon tax or investments in renewable energy). But even far-reaching initiatives must be complemented with less comprehensive, and easy-implementable initiatives to ensure progress. In this context, we note that initiatives feasibility fluctuates across contexts and time. Subsequently, we encourage policy-makers to select the policy instruments—including other instruments than presented here—most fitting for their context without compromising the effectiveness in reducing environmental impacts, while also bearing in mind that there is no panacea with regards to addressing the environmental challenges posed to the clothing industry.

Despite consumers' important role in a sustainable transition, it is critical not to become blindsided and disregard initiatives targeting earlier lifecycle phases. There are notable limitations to reducing environmental impacts only through consumer policies and policy-makers must incentivize manufacturers and producers to simultaneously change manufacturing, production, and distribution methods. In other words, consumer policy initiatives cannot go alone but should go hand-in-hand with policies targeting supply chains and product quality that directly influence environmental impacts induced by all consumers.

# references

- Allwood, J.M., Laursen, S.E., Malvido de Rodríguez, C. & Bocken, N.M.P. (2006) Well Dressed? The Present and Future Sustainability of Clothing and Textiles in the United Kingdom. University of Cambridge, Cambridge.
- American Apparel and Footwear Association (2014). ApparelStats 2014. Arlington, VA, USA. Available online: [www.wewear.org/apparelstats-2014-and-shoestats-2014-reports/](http://www.wewear.org/apparelstats-2014-and-shoestats-2014-reports/)
- Asthana, A., & Taylor, M. (2017). Britain to ban sale of all diesel and petrol cars and vans from 2040. *The Guardian*. Retrieved from: <https://www.theguardian.com/politics/2017/jul/25/britain-to-ban-sale-of-all-diesel-and-petrol-cars-and-vans-from-2040>.
- Baranzini, A., Van den Bergh, J. C., Carattini, S., Howarth, R. B., Padilla, E., & Roca, J. (2017). Carbon pricing in climate policy: seven reasons, complementary instruments, and political economy considerations. *Wiley Interdisciplinary Reviews: Climate Change*, 8(4), e462.
- Bey, N., Birkved, M., Gwozdz, W., Nielsen, K. S., & Müller, T. (2018). Environmental impact of clothing – How much does the use stage matter? Unpublished manuscript.
- Biel, A., & Thøgersen, J. (2007). Activation of social norms in social dilemmas: A review of the evidence and reflections on the implications for environmental behaviour. *Journal of economic psychology*, 28(1), 93-112.
- Bjelle, E. L., Steen-Olsen, K., & Wood, R. (2018). Climate change mitigation potential of Norwegian households and the rebound effect. *Journal of Cleaner Production*, 172, 208-217.
- Brown, C. L., & Krishna, A. (2004). The skeptical shopper: A metacognitive account for effects of defaults options on choice. *Journal of Consumer Research*, 31, 529-539.
- Choo, H.J., Sim, S.Y., Lee, H.K., Kim, H. Bin, 2014. The effect of consumers' involvement and innovativeness on the utilization of fashion wardrobe. *International Journal of Consumer Studies*, 38, 175-182. <https://doi.org/10.1111/ijcs.12078>
- Choudhury, A. R. (2014). Environmental impacts of the textile industry and its assessment through life cycle assessment. In *Roadmap to Sustainable Textiles and Clothing* (pp. 1-39). Springer, Singapore.
- de la Motte, H., & Palme, A. (2018). The development of the Blend Re: wind process. Report for Mistra Future Fashion. Task deliverable: 4.1.1.4.
- Ebeling, F., & Lotz, S. (2015). Domestic uptake of green energy promoted by opt-out tariffs. *Nature Climate Change*, 5(9), 868-871.
- Elander, M., Tojo, N., Tekie, H., & Hennlock, M. (2017). Impact assessment of policies promoting fiber-to-fiber recycling of textiles. *Mistra Future Fashion report*.
- Elander, M., Watson, D., & Gylling, A. C. (2017). Evaluation of business models for increased reuse, collective use and prolonged life time of textiles. *Mistra Future Fashion report*.
- Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning Fashion's Future. Available at: [www.ellenmacarthurfoundation.org/publications](http://www.ellenmacarthurfoundation.org/publications) (Accessed 18 September 2018).
- Euromonitor International (2016). Apparel and Footwear 2016 edition: Volume sales trends 2005-2015.

European Commission (2008). Directive 2008/98/EC on waste and repealing certain directives. Official Journal of the European Union. Available at: <https://eur-lex.europa.eu/eli/dir/2008/98/oj> (Accessed on 18 September 2018).

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of consumer Research*, 35(3), 472-482.

Gouldson, A., Lopez-Gunn, E., Van Alstine, J., Rees, Y., Davies, M., & Krishnarayan, V. (2008). New alternative and complementary environmental policy instruments and the implementation of the Water Framework Directive. *European Environment*, 18(6), 359-370.

Grankvist, G., Dahlstrand, U., Biel, A. (2004). 'The impact of environmental labelling on consumer preference: negative vs. positive labels', *Journal of Consumer Policy*, 27(2), p. 213-230.

Gwozdz, W., Nielsen, K. S., & Müller, T. (2017). An environmental perspective on clothing consumption: consumer segments and their behavioral patterns. *Sustainability*, 9(5), 762.

Gwozdz, W., Nielsen, K. S., Webb, K., Gupta, S., & Gentry, J. (2018). Exploring the Relationship Between Clothing 'Style' and 'Fashion' Orientations, Materialism and Subjective Well-Being. Unpublished manuscript.

Hvass, K. K. (2015). Business Model Innovation through Second Hand Retailing. *Journal of Corporate Citizenship*, 57, 11-32.

IPCC (2018). Global warming of 1.5°C. Cambridge: Cambridge University Press.

Ivanova, D., Stadler, K., Steen-Olsen, K., Wood, R., Vita, G., Tukker, A., & Hertwich, E. G. (2016). Environmental impact assessment of household consumption. *Journal of Industrial Ecology*, 20(3), 526-536.

Ivanova, D., Vita, G., Steen-Olsen, K., Stadler, K., Melo, P. C., Wood, R., & Hertwich, E. G. (2017). Mapping the carbon footprint of EU regions. *Environmental Research Letters*, 12(5), 054013.

Iwanow, H., McEachern, M. G. & Jeffrey, A. (2005). The influence of ethical trading policies on consumer apparel purchase decisions. A focus on The Gap Inc. *International Journal of Retail & Distribution Management*, 33(5), 371-387.

Jackson, T. & Michaelis, L. (2003). *Policies for sustainable consumption: A report to the Sustainable Development Commission*, London. Retrieved from: <https://core.ac.uk/download/files/95/1586786.pdf>.

Johnson, E. J., & Goldstein, D. (2003). Do defaults save lives? *Science*, 302, 1338-1339.

Kim, H. S., & Damhorst, M. L. (1998). Environmental concern and apparel consumption. *Clothing and Textiles Research Journal*, 16, 126-133.

Klenert, D., Mattauch, L., Combet, E., Edenhofer, O., Hepburn, C., Rafaty, R., & Stern, N. (2018). Making carbon pricing work for citizens. *Nature Climate Change*, 8, 669-677

Kozar, J. M., & Hiller Connell, K. Y. (2013). Socially and environmentally responsible apparel consumption: knowledge, attitudes, and behaviors. *Social responsibility journal*, 9(2), 315-324.

Nielsen, K. S., & Gwozdz, W. (2018). Report on Geographic Differences in Acceptance of Alternative Business Models. Mistra Future Fashion. Task deliverable: 3.1.2.1.

OECD (2008). Promoting Sustainable Consumption: Good Practices in OECD Countries. Paris: OECD.

OECD (2010). Consumer Policy Toolkit. Paris: OECD.

Ölander, F., & Thøgersen, J. (2014). Informing versus nudging in environmental policy. *Journal of Consumer Policy*, 37(3), 341-356.

Pedersen, E. R. G., & Netter, S. (2015). Collaborative consumption: Business model opportunities and barriers for fashion libraries. *Journal of Fashion Marketing and Management*, 19(3), 258-273.

Pezzey, J. C., & Jotzo, F. (2013). Carbon tax needs thresholds to reach its full potential. *Nature Climate Change*, 3(12), 1008.

Pichert, D., & Katsikopoulos, K. V. (2008). Green defaults: Information presentation and pro-environmental behaviour. *Journal of Environmental Psychology*, 28(1), 63-73.

Reisch, L. A., & Zhao, M. (2017). Behavioural economics, consumer behaviour and consumer policy: state of the art. *Behavioural Public Policy*, 1(2), 190-206.

Roos, S., Sandin, G., Zamani, B., Peters, G., & Svanström, M. (2017). Will clothing be sustainable? Clarifying sustainable fashion. In *Textiles and Clothing Sustainability* (pp. 1-45). Springer Singapore.

Roos, S., Zamani, B., Sandin, G., Peters, G. M., & Svanström, M. (2016). A life cycle assessment (LCA)-based approach to guiding an industry sector towards sustainability: The case of the Swedish apparel sector. *Journal of Cleaner Production*, 133, 691-700.

Sandin, G., & Peters, G. M. (2018). Environmental impact of textile reuse and recycling—A review. *Journal of Cleaner Production*, 184, 353-365.

Schmitz, A., & Stamminger, R. (2014). Usage behaviour and related energy consumption of European consumers for washing and drying. *Energy Efficiency*, 7, 937-954.

Scholl, G., Power, K., Berger, G., Rubik, F., Freytag, E., Herczeg, M., ... & Rouhinen, S. (2013). Enabling Sustainable Consumption: Making Better Use of Research Evidence in Policy-Making. Retrived from: <http://www.scp-knowledge.eu/sites/default/files/knowledge/attachments/CORPUS Policy Brief.pdf>.

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological science*, 18(5), 429-434.

Siebens, J. *Extended Measures of Well-Being: Living Conditions in the United States: 2011*; United States Census Bureau: Washington DC, USA, 2013; Volume 70, p. 136.

Sparkman, G., & Walton, G. M. (2017). Dynamic norms promote sustainable behavior, even if it is counternormative. *Psychological science*, 28(11), 1663-1674.

Sunstein, C.R., 2014. Nudging: A Very Short Guide. *Journal of Consumer Policy*, 583.

Taylor, C., Pollard, S., Rocks, S., & Angus, A. (2012). Selecting policy instruments for better environmental regulation: a critique and future research agenda. *Environmental Policy and Governance*, 22(4), 268-292.

Thøgersen, J. (2000). Psychological determinants of paying attention to eco-labels in purchase decisions: Model development and multinational validation. *Journal of Consumer Policy*, 23(3), 285-313.

- Thøgersen, J., Haugaard, P., & Olesen, A. (2010). Consumer responses to ecolabels. *European Journal of Marketing*, 44(11/12), 1787-1810.
- Thøgersen, J., & Nielsen, K. S. (2016). A better carbon footprint label. *Journal of Cleaner Production*, 125, 86-94.
- UNEP (2015). Sustainable Consumption and Production - A Handbook for Policymakers. *United Nations Environment Programme*.
- United States Environmental Protection Agency. *Advancing Sustainable Materials Management: 2014 Fact Sheet*; Office of Land and Emergency Management, United States Environmental Protection Agency: Washington, DC, USA, 2016.
- Policy*, 38(1), 19-38.
- Vandenbergh, M. P. (2006). The New Wal-Mart Effect: The Role of Private Contracting in Global Governance. *UCLA L. Rev.*, 54, 913.
- Vandenbergh, M. P., Dietz, T., & Stern, P. C. (2011). Time to try carbon labelling. *Nature Climate Change*, 1(1), 4-6.
- Verplanken, B., & Wood, W. (2006). Interventions to break and create consumer habits. *Journal of Public Policy & Marketing*, 25(1), 90-103.
- Watson, D., Gylling, A. C., & Thörn, P. (2017). Business models extending active lifetime of garments: supporting policy instruments. Mistra Future Fashion Report. Task deliverable: 3.2.4.
- Weller, I. (2013). Sustainable consumption and production patterns in the clothing sector. Is green the new black? In: M. A. Gardetti & A. L. Torres (eds.). *Sustainability in fashion and textiles*, p.184-194. Sheffield, UK: Greenleaf Publishing Limited.
- Wood, W., Tam, L., & Witt, M. G. (2005). Changing circumstances, disrupting habits. *Journal of Personality and Social Psychology*, 88(6), 918-933



Mistra Future Fashion is a research program that focuses on how to turn today's fashion industry and consumer habits toward sustainable fashion and behavior. Guided by the principles of the circular economy model, the program operates cross disciplinary and involves 60+ partners from the fashion ecosystem. Its unique system perspective combines new methods for design, production, use and recycling with relevant aspects such as new business models, policies, consumer science, life-cycle-assessments, system analysis, chemistry, engineering etc.

MISTRA is the initiator and primary funder covering the years 2011-2019. It is hosted by RISE Research Institutes of Sweden in collaboration with 15 research partners.

FUNDED BY



The Swedish Foundation for  
Strategic Environmental Research

