7. Regulation with a lasting impact? Policies for product durability

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> Poor people cannot afford cheap things. *(Finnish saying)*

7.1 Introduction

Extending the lifetime of products and components has the potential to slow down the overall flow of resources in the economy (Bocken et al. 2015) and support the circular economy (CE). A CE is promoted as a conceptual model towards a more sustainable system of consumption and production (Sustainable Development Goal 12) (see, e.g., Khajuria et al. 2022). The lifetime of most products can be extended through the use of more robust materials, design for durability, care, maintenance, repair, and reuse, thus reducing waste and the need to extract materials for manufacturing. These strategies, and the importance of product lifetimes in a CE context, also mean that there is a strong correlation between: 1) product policies that support a CE; and 2) the concept of product durability (i.e. products that – in some way or another – maintain their function, form, and attractiveness over time). While different product groups face different interpretations of durability and different challenges – for example, the implications of durability for textiles will differ from those for electronics (see, e.g. Klepp et al. 2022) – there is still a common overarching issue of overproduction and overconsumption, even of durable items.

The choice of which products to purchase is important as it creates 'lock-ins'. For instance, buying second-hand (or retro) items is increasingly popular in many countries, but if our parents and grandparents had chosen to purchase

cheap stuff with limited durability, there would be nothing retro to buy today. In addition, product characteristics are determining environmental impacts in several other ways, such as resource use (purchasing fewer but more durable products leads to using less material), energy use (how energy efficient is the product?), toxic waste (does the product contain dangerous substances?), and plastic pollution (what is the product made of?).

Looking back in time, some authors argue that consumer and professional products were more durable or were used for longer than they are today, and people used to maintain and repair them on their own or by using cobblers, tailors, blacksmiths, etc. (Slade 2006; Strasser 1999). One example, from one of the authors of this chapter, is a shirt inherited from his father: the shirt survived over 40 years of intense use without any need for repairs. The introduction to this book argues that the mass production techniques introduced in the Industrial Revolution made it possible to produce larger volumes of standardised products, as well as increased durability and accumulation. This led to concerns that, if the products had a very long lifetime, demand would not be able to match supply, and not all products that were manufactured could be sold (i.e. overproduction), thus leading to unemployment and economic recession. An important asymmetry between the supply and demand of products is indeed seen as one of the factors leading to the Great Depression of the 1930s. An answer to this problem was thus for manufacturers to shorten product lifetimes through the active planning of product obsolescence, as elaborated by London (1932). In other words, a wide range of products were made to break prematurely, prompting quick replacement and high consumption levels (Slade 2006).

Victor Lebow summarised the implications of what is known as a 'productive economy':

> *Our enormously productive economy … demands that we make consumption our way of life, that we convert the buying and use of goods into rituals, that we seek our spiritual satisfaction, our ego satisfaction, in consumption … [W]e need things consumed, burned up, replaced and discarded at an ever-accelerating rate.* (Lebow 1955)

Obviously, these trends do not apply to all kinds of products, or all markets. There are still examples of well-crafted products in some markets, e.g. for furniture, machinery, and professional clothing, not least in business-to-business markets. Further, 'premature' obsolescence, whereby manufacturers

make a product 'good enough', considering consumer expectations and price competition, is increasingly problematic (Dalhammar et al. 2021b). This implies that obsolescence is not necessarily 'planned'. It is nonetheless evident that there are indeed many low-quality consumer products on the market, and poor quality is a key reason behind, for example, e-commerce consumer returns being destroyed by the retailer without the items ever being in use; destruction is less costly than making the returned product available for sale again (Roberts et al. 2023).

It is increasingly understood that public policy interventions are necessary to enable longer product lifetimes as part of a CE, given the existing barriers found in the current 'linear' economy. To this effect, in the last 20 years, both EU and national policymakers have attempted to address growing concerns about the environmental and human health impacts of production, consumption, and waste. Pursuing product durability is part of these policy efforts to realise a CE, with the assumption that slowing product loops can slow the impacts of production and consumption. Required policy interventions for the CE include both the adoption of new policies (e.g. on product design) and changes to existing policies (such as consumer laws) that act as barriers to circular solutions. The literature argues for policy changes in international (Lindahl and Dalhammar 2022), European (Wilts and O'Brien 2019; Milios 2018), national (Circle Economy n.d.; Milios 2016), and regional and local (Circle Economy 2019; Dagilienė et al. 2021) levels. Product-oriented policies, such as design standards, guarantees, public procurement, and lifecycle costing measures, are a key part of the CE policy agenda.

Promoting product durability is part of these policy efforts. However, on its own this would not solve the current problems related to our consumption patterns. Although more durable products may often cost more, both to produce and to purchase, there are many barriers beyond product durability that must also be addressed (such as the primacy of shareholders and other shortcomings in company law, as well as short-term and narrow pressure for the maximisation of returns to investors in financial markets and the banking sector) if we are to achieve a true sustainability transition (Sjåfjell et al. 2019). Otherwise, we risk upholding mass production, overproduction, and the consumerist society, but with more durable products, thus potentially aggravating both ecological and social pressures.

Consumers are also important actors: they must be willing to invest in high-quality products. However, while consumers generally want more durable products, there is evidence that this mainly applies to certain product

categories (Dalhammar et al. 2021b), and it is questionable whether consumers in general are prepared to pay more for durable products (Sajn 2022). There is also a gap in policies addressing citizens and consumers.

In this chapter, we consider the concept of 'durability' in relation to the production and consumption of products, and we explore how public policies can promote longer-lasting products through targeted policy interventions. Public policies have an important role in shaping economies; in essence, they influence the rules of the game. We focus on the context of the EU to exemplify the multi-level and multi-dimensional character of such policy approaches. In Europe, several policies have been adopted that address the various lifecycle aspects of products (for an overview, see, e.g., Dalhammar et al. 2021a), including regulating chemicals in products (Alaranta and Turunen 2021), producer responsibility rules that mandate consumers to collect and recycle end-of-life products (e.g. Manomaivibool 2009; Maitre-Ekern 2021), and rules that set minimum energy efficiency standards for products (Dalhammar et al. 2018). This policy mix is complemented by other policies that address several environmental aspects, such as ecolabels and sustainability criteria in green public procurement (Milios 2016; Dalhammar et al. 2021a; Hansen et al. 2021).

In this contribution, we critically examine these policies and discuss additional policy interventions that could promote longer-lasting products and components. The stated research objectives are to:

- describe and analyse emerging European policies that aim to increase product lifespans; and
- relate policy developments to the concept of a 'durable economy' for products.

The methods employed are:

- literature searches using relevant keywords in Scopus, Web of Science, Google Scholar, and LUBSearch; and
- a policy analysis, which in this case involves an analysis of current policies and potential policy outcomes, and the consistency of the 'policy package'. When relevant, references are also made to specific laws.

We mainly deal with consumer products (business-to-consumer), not business-to-business. We have not limited our analysis to specific product categories, but many of the examples are related to consumer electronics

and appliances. The analysis is nonetheless relevant for textiles and furniture. Further, we consider various types of policies (i.e. administrative, economic, and informative) and various legal fields (e.g. consumer law and product regulation). The main focus is on EU policies and national policies, but, in some cases, references are made to local initiatives.

Chapter 1 of this book put forward the argument that durability is a contested quality whose definition remains something of a black box, and that there are multiple qualities to durability that contribute to the ability of things to hold their shape, such as robustness, sturdiness, reliability, stickiness, timelessness, and resilience. These qualities, in turn, also influence whether products become prematurely obsolete as well as the length of their lifetimes. In addition, practices of consumption, use, repair, and so on are determinants for durable economies. The production of more durable products does not in itself create a less consumerist society.

In a European standard, durability is more formally defined as the 'ability to function as required, under defined conditions of use, maintenance and repair, until a limiting state is reached'.[1] In this case, we are examining product durability in terms of qualities of robustness and functionality, recognising that these in turn are dependent upon and exist in relation to many factors involved in the conditions of use, maintenance, and repair. While factors such as attractiveness, newness, and product care also play a role in product lifetimes, these are considered less by current policies and are included only in the perspectives of citizens. When discussing functionality, we also refer to the product lifetime. In this chapter, we primarily understand lifetime as technical, or functional, lifetime, which can be expressed as the total period during which an asset or machine can technically perform or function before it must be replaced. Importantly, lifetime is not necessarily measured in 'time'; other possible units include number of cycles, hours in operation, kilometres driven, etc. Some other key concepts, with definitions taken from European standards and laws, are found in Table 7.1.

1 EN 45552:2020.

Table 7.1: Definitions from standards and legal texts.

Concept	Definition
Durability	Ability to function as required, under defined conditions of use, maintenance and repair, until a limiting state is reached (EN 45552:2020)
Reliability	Probability that a product functions as required under given conditions, including maintenance, for a given duration without limiting events (EN 45552:2020)
Maintenance	Action carried out to retain a product in a condition where it is able to function as required (EN45552:2020)
Repair	Process of returning a faulty product to a condition where it can fulfill its intended use (EN 45554:2020)
Spare part	A separate part of an EEE [product] that can replace a part of an EEE. The EEE cannot function as intended without that part. The functionality of EEE is restored or is upgraded when the part is replaced by a spare part. (RoHS Directive, Article 3)

A significant difference between durability and reliability is that the latter concept does not include repairs. Thus, the reliability of a product may be five years of normal functionality but repairing restores the durability of the product and can extend the product lifetime.

In the next section, we discuss why products become obsolete as a starting point for our investigation into the ways in which durability can be addressed through policy. This is followed by an analysis of the potential gains from durability and longer product lifetimes, from both an environmental and a consumer perspective, and a review of the main strategies that can be employed for achieving longer product lifetimes. We then discuss existing and emerging policy approaches at the EU level, at national levels, and at local levels, to support longer lifetimes through durability, repair, and refurbishment. This is followed by a section on the role of citizens, in which we examine how they can be engaged to support longer product lifetimes as well as barriers to them playing a more active role. We then discuss policy strategies and the latest developments in light of the concept of a 'durable economy'. Finally, we end with concluding remarks on how current policies should be even more progressive to support longer-lasting products, and why we need to further question the way current markets work.

It should be noted that the European policies primarily aim to bring about longer product lifetimes. While longer product lifetimes can obviously be associated with the concept of 'durability', they are not necessarily the same. In our final discussions we consider these issues.

7.2 Reasons for premature obsolescence

It should be noted that it is hard to obtain good information on how durable products have been in the past. Furthermore, many products sold today are quite durable, and product lifetimes have not necessarily become shorter for all product categories (Dalhammar et al. 2021b). Still, there are clear indications that the lifespan of some product groups is shrinking (Huisman et al. 2012; Prakash et al. 2016; Stamminger et al. 2018). Although in most product categories there are a few so-called 'champions' – i.e. very long-lived products – there is nonetheless a need and potential to increase the lifespan of more products. Thus, while we may not aim – at least in the short term – for very durable items, or for lightbulbs that last over 100 years, it should be possible to make most everyday products longer-lasting than they currently are.

Moreover, the literature highlights that people want products to last longer (Echegaray 2016; Cooper 2004; Wieser et al. 2015; Sajn 2022), or be repairable (Perzanowski 2021), although the age of the consumer influences how long some products – like mobile phones – are used for (Wieser and Tröger 2018). Further, consumers are more interested in longer lifetimes for certain product categories (e.g. so-called workhorse products such as white goods) than others ('up-to-date' products); reasons for this include long lifetimes effectively 'locking in' consumers to owning a product considered to be outdated (Dalhammar et al. 2021b; Jaeger-Erben et al. 2021).

The main reasons for product obsolescence include the following (for a deeper discussion of these issues, see Proske and Jaeger-Erben 2019; Kahlin McVeigh et al. 2019) :

- **Product failure or breakdown:** This is often due to specific components breaking down. Product failure can be the result of in-built obsolescence (e.g. printer cartridges that are made to stop functioning before they are fully empty) or the use of low-quality materials.

- **Lack of access to repair:** In particular the lack of access to spare parts, tools, and manuals, or services for repairs outside the repair service network authorised by the product manufacturer.
- **Economic obsolescence:** Repair services or parts are available, but expensive or inconvenient, or generally considered inferior to buying a new product with a guarantee.
- **Technological or functional obsolescence:** 'Outdated products', e.g. a lack of software updates or support, or software updates that impede the functioning of the product.
- **Symbolic obsolescence:** Obsolescence driven by marketing campaigns and social expectations, abundance, and a search for 'newness', etc.

Current policy approaches primarily focus on the first three categories above. It is usually more difficult to address technological and symbolic obsolescence through policy: if people want novelty, there is little point in adopting policies for prolonging the lifetime of old products they will discard anyway. In addition, it is also important to note that sometimes obsolescence can be planned for safety and other reasons: for example, products and components become obsolete if they are found to be defective or unsafe (e.g. they contain toxic materials), or undesirable for other reasons (e.g. inefficient appliances that may still be functional).

Manufacturers can make use of one or more of the following three key strategies to stimulate repetitive consumption (i.e. shorter consumption cycles): 1) the limitation of material or component durability; 2) lack of repairability; and 3) design features that stimulate rapid replacement (Guiltinan 2009).

Consumers often believe that companies engage in 'planned obsolescence'. This has been defined by French legislators as: 'A group of techniques through which a manufacturer or a marketer seeks to deliberately reduce the lifecycle of a product in order to increase its replacement rate.'[2] However, while planned obsolescence does occur (Kahlin McVeigh et al. 2019), there is limited evidence that it is commonplace, at least as a deliberate act; products may have a rather short lifetime, but this is not planned per se (e.g. Longmuss and Poppe 2017). Instead, other market factors can explain why products are not as durable as people expect, or as durable as their designers intended. These factors include

2 French Consumer Code Articles L441-2.

increased product complexity, cost pressures, and shorter time to market (ibid.).

Nevertheless, even if planned obsolescence is not common, there is evidence that producers adopt strategies that make it difficult or even impossible for users to repair their products (Svensson-Hoglund et al. 2021; Dalhammar et al. 2021b; López Dávila et al. 2021b), thus effectively shortening product lifetimes. Strategies to reduce repairs notably include product designs that make repairs difficult and expensive, expensive spare parts, and intellectual property rights and contracts that stop independent repairers and citizens from engaging in repair activities.

Many consumer products – from electronics to clothes – have a strong aesthetic design element. New designs of the same product or product category are released regularly, with new aesthetics and functions emphasised in their marketing. Also, fundamental functions are 'extended' in new product models by way of attracting attention to their symbolic meanings (Eisenman 2013). Such practices stimulate the replacement of products before failure. Thus, even a 'durable' product can in practice have a short lifetime because a newer model has prompted its disposal.

Since planned obsolescence is rare, the preferred term for strategies that effectively limit product lifetime is 'premature obsolescence'. The term has no formal definition, but it describes a situation in which products break down faster than expected and/or cannot be repaired due to design or cost reasons. Whether the breakdown of a product is 'premature' can be measured against a standard: for instance, a consumer guarantee, a legally set requirement on product lifetime, or reasonable consumer expectations (Dalhammar et al. 2021b).

7.3 Encouraging longer product lifetimes and durability: rationale and strategies

Durability is generally seen as a key strategy towards a sustainable CE and is largely linked to initiatives to increase product lifetime. Extending product lifetimes can be achieved in many ways; not all strategies will necessarily be linked to product durability, particularly if longevity is to be achieved through reuse or repurposing; in that case, the product may have a 'first life' and a 'second life', and the durability of the first life and/or the total lifetime can be rele-

vant. While these issues are complex, what we really want in the context of the CE is to maintain the value of a resource.

Thus, longer functional lifetimes are very much associated with durability. An important question is whether longer product lifetimes are always beneficial in terms of achieving sustainability. A recent literature review (Dalhammar et al. 2021b) found the following:

- Longer lifetimes are generally positive for 'passive' products, such as furniture and textiles, as well as for products that have their most significant environmental impacts in the extraction and production phases, such as ICT and consumer electronics.
- For high energy-consuming products, such as white goods, there can be a trade-off between energy use (and thus climate change impacts) and resource gains (which are connected to various environmental impacts). Then, the optimal lifetime depends on, inter alia, how much more energy efficient a new replacement product is compared with the old product and how often it is used. The electricity mix of a country also has an impact: in countries with a high share of renewables in the electricity mix, it is less environmentally beneficial to switch to a more energy-efficient product.
- As more and more product groups are coming closer to the technical limits of energy-efficiency improvements, it makes more sense to prolong their lifetime, as new models do not provide much in the way of energy-efficiency gains. Further, if people buy more efficient products but do not use the 'eco mode' – perhaps because the eco mode programme of a dishwasher takes several hours – the potential gains from a more efficient product are not materialised.

Generally, it is agreed that it does make sense – from an environmental perspective – to prolong the lifetime of most products. The next question is what 'lifetime' really means. This is not necessarily straightforward, especially for more complex products such as lightbulbs, where lifetime relates not only to how long the product functions, but also to whether its colour and light (lumen) output remain consistent over time.

There are three main strategies to extend product lifetimes: 1) design for long life; 2) handle products with care (maintenance) to extend life; and 3) support the 'R' strategies that focus on keeping the product in use for longer (in particular repair, refurbishing, and reuse) (Dalhammar et al. 2021b). The first key strategy consists of designing for durability: for example, investing in higher-

quality materials or making the product more robust or more repairable (i.e. easy dismantling, production of key spare parts, etc.). However, durable or repairable products make sense only if they are used for a longer period of time. That is where the second strategy, which aims to ensure that products are continuously maintained and serviced, comes in, with the objective of increasing the product's lifetime in use. The third strategy relating to 'R' activities (see Table 7.2) effectively postpones the moment when products and individual components reach their end of life. For instance, direct reuse and repair, done together or separately, can enable continued usage of an older product. Refurbishment or re-manufacturing can be applied to products and components to restore functionality, or even enhance it. It should be noted that the exact definitions of several of the 'R' activities are not agreed upon in laws or standards, and they are often used in different ways (for more discussion on the terminology, see, e.g., Gustavsson et al. 2021; IRP 2018; EC 2020).

Table 7.2: The 'R' activities explained

Term	User	Definition	Level
Repair and maintenance	First user	Extends the life of a product during its first use by retaining or restoring its functionalities with maintenance and minor repairs that can be done by users, manufacturers, or professional service providers	Product
Reuse	Second-hand	Extends the life of a product or part by having a second-hand user utilise it for the same original purpose with no or only minor enhancements and changes Can be combined with refurbishing	
Refurbishment	Second-hand	Extends the life of a product by replacing a few major components, which restores its functionality and provides a good or acceptable performance for a second-hand user (also known as reconditioning)	

Term	User	Definition	Level
Comprehensive refurbishment	Second-hand	Extends the life of a product by undertaking refurbishment activities (see above) within industrial or factory settings, with a high standard and level of refurbishment to enable the product to meet applicable technical standards or regulatory requirements, with the result of making a fully functional product to be used for its originally intended purpose	
Repurposing	Second-hand in another application	Extends the life of a product or part by using it for a purpose than the one it was originally produced for (sometimes also known as cascaded or second use)	
Remanufacturing	Second-hand	Enables a full new service life of a product via a standardised industrial process that takes place within industrial or factory settings, in which cores are restored to original as-new condition and performance, or better The re-manufacturing process is in line with specific technical specifications, including engineering, quality, and testing standards, and typically yields fully warranted products (and per agreement of global industry members)	Component
Recycling	Same industry (closed) Any other industry (open)	Closes material cycles by retrieving raw materials from the product and returning them to the production process of new products in lower-quality uses or in other products (down-cycling or open-loop), similar products with the same quality (closed-loop), or higher quality and functionality (upcycling)	Material
Recovery	Any	Only the energy is recovered, through, for example, incineration, while the material is lost (but the material replaces another fuel)	Energy

Source: Based on Albertsen 2020, with amendments.

The 'R' strategies involving restoration of functionality can be related to supporting durability. While these strategies refer to products and components, they are dependent upon practices, which involve capabilities,

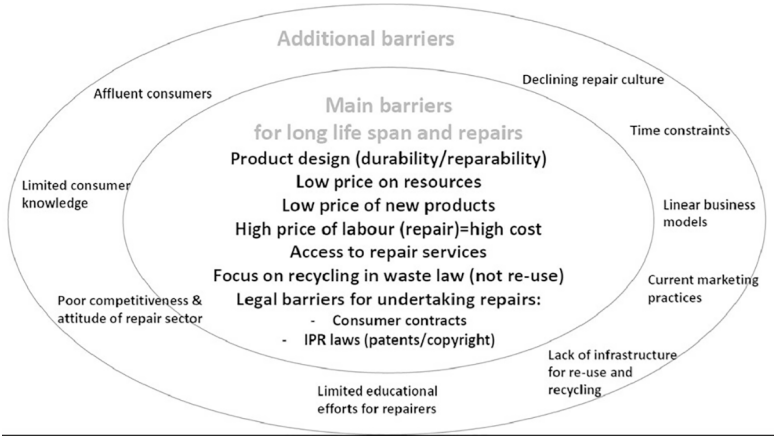
knowledge, and routines and ultimately depend on social and material arrangements. While many 'R' strategies focus on the product, it is also necessary to consider the role of components within product-focused strategies. For example, harvesting components from end-of-life or obsolete products can enable reuse and repair at the product level, as the harvested spare parts may allow for a less costly repair process (Richter et al. 2022). The policies that aim to increase the lifespan of products and components do so by incentivising design for longer life and/or support the 'R' activities in various ways.

It should be noted that the various 'R' activities in Table 7.2 are not equal from a consumer perspective: a consumer would prefer to buy a product that is 'durable' rather than one that is 'repairable' (Dalhammar et al. 2021b). When buying a new product, durability is associated with quality, whereas a reference to it being 'repairable' could be interpreted as it being of poorer quality, because it seems to imply that repair will be needed. From an environmental perspective, durability is also superior to repairability, since repair means that new components will be needed and existing ones will be discarded. Plus, in practice, many repairable products are discarded because repair is not attempted or proves unsuccessful (see, e.g., Jaeger-Erben et al. 2021). However, policymakers do not necessarily prioritise durability over repairability policies (Dalhammar et al. 2021b). For instance, requirements in the Ecodesign Directive (2009/125/EC) more commonly address repairability than durability. The main reason for this is that it is easier to enforce rules on repairability, whereas it is more complicated to define – and thus enforce – durability.

7.4 Policies promoting longer functional lifetimes and durability

The emergence of the CE as a distinct area of policymaking has provided momentum for new policies that promote longer lifetimes, and we now see several such policies – adopted or proposed – at European, national, regional, and local levels. Importantly, given the many barriers to longer product lifetimes and the 'R' activities, a substantive policy mix is required (see Figure 7.1).

Figure 7.1: Summary of barriers for longer lifetimes, reuse, remanufacturing, and repairs.



Source: Dalhammar et al. 2021b.

In this section, we first discuss the policies related to durability and longer functional lifetimes through design, repair, reconditioning, refurbishment, and re-manufacturing more specifically. We end this section by discussing existing policies that create barriers to durability and longer product lifetimes.

Several recent policy proposals address product lifetimes. The European Commission presented its package of policy proposals under the Sustainable Products Initiative (SPI) in March 2022 (for an overview, see EC 2022c). It proposes the introduction of digital product passports that may be used to transfer data on lifetime and repair activities. Further, the proposal for a new ecodesign regulation will cover new products groups such as furniture and textiles, where lifetime and repairability requirements will most likely be discussed.

The Commission package also included an initiative on 'empowering consumers for the green transition' (EC 2022a). It contains proposals to ensure that consumers obtain reliable and useful information on products, including on their lifespan and repair options, and to prevent sales of products with a covertly shortened lifespan (ibid.). Furthermore, a Commission proposal on 'right to repair' (R2R) is expected in 2023.

There are also national proposals for changing marketing practices. In France, the NGO HOP (2020) has proposed: 1) introducing an obligation for advertisers to mention repair, reuse, and the second life of products, as well

as recycling opportunities of the products they advertise; 2) regulating green claims in advertising and marketing to avoid green-washing by banning the use of certain wording that minimises a product's impact on the environment; and 3) imposing the display of environmental indicators in advertising (such as ecolabels).

Table 7.3 gives an overview of different adopted and proposed policies at the EU, member states, and local or regional level that address longer product lifetimes.

Table 7.3: Overview policies for longer product lifetimes.

	European Union	**EU member states**	**Other (local/regional)**
Adopted	*Ecodesign Directive*: new mandatory requirements on products on the EU market; related to durability, repairability, provision of spare parts, etc. *Standardisation* activities to develop new product standards on concepts such as durability, reuse, repairability, and recyclability; these standards will make it easier to regulate these issues in future laws (ongoing process) *Change VAT rules* *Digital product passports*	*Criminalising planned obsolescence* (France) *Fines for planned obsolescence due to software updates* (competition authorities of Italy and France) Strengthening *legal* (mandatory) *product guarantees* in consumer law (several EU countries) *Tax relief for repair* (e.g. Sweden) *National accreditation* of reuse organisations (e.g. Belgium) *Repairability index* (France) *Ban on destruction of unsold/unused products* *Better regulatory frameworks for sharing and leasing* *VAT changes to support reused goods, sharing, and leasing*	*Public procurement* of re-manufactured ICT and furniture (e.g. Sweden) *Reuse centres* and similar infrastructure; diverting end-of-life products to reuse *Networks for reuse*, including infrastructure, quality controls, and marketing (e.g. the Flemish reuse network), *repair networks* (e.g. Vienna), and *repair cafés* *Subsidies for repairs* (e.g. repair vouchers in Vienna) *Encouraged use of re-manufactured spare parts* for federal government vehicle fleet maintenance (e.g. USA) *Government support for private reuse firms* (e.g. Sweden) *Quality labels for reused goods* to instil consumer confidence (several EU countries)

	European Union	EU member states	Other (local/regional)
Proposed	*Consumer law* changes to ensure that consumers receive trustworthy information on product lifespan, the availability of repair services, spare parts, and repair manuals *Mandatory changes of marketing practices* *Mandatory labelling on expected product lifetimes* *Additional measures to promote R2R* *Public procurement criteria* for remanufactured goods	*National public procurement criteria* for re-manufactured goods such as furniture and ICT products (under development) *Standards and quality labelling* schemes for reused products (under development)	*R2R laws* proposed in several US states, with provisions to enable consumers to repair their products and allow independent repairers to access the after-sales market

Source : Dalhammar et al. 2021c.

In addition to the initiatives outlined in Table 7.3, there is also untapped potential; legal norms could have an impact on stakeholder attitudes and behaviours, directly and indirectly, when it comes to product durability, not least individuals' attitudes and expectations regarding product lifespans. However, even though EU law stipulates that sustainability should be considered across EU policies and activities,[3] not all policies with influence on product longevity do so appropriately. For example, EU consumer law[4] fails to include durability in the requirements on product quality (Pihlajarinne 2022: 120–1, 125).

7.4.1 New European standardisation activities

The European Commission made a standardisation request (M/543) to the European standardisation organisations CEN, CENELEC, and ETSI in 2015. The aim was to develop standards on material efficiency that would support future legal requirements for energy-related products, most notably those set under the Ecodesign Directive. Most of the standards are not intended to be directly applied to a specific product group, but rather to be used as a framework for the development of product group-specific standards. The topics covered in the standardisation request are linked to the following material efficiency aspects of energy-related products:

- product lifetime extension though design for durability, repairability, and remanufacturing;
- ability to reuse components from products at their end of life (which in turn could support repair and re-manufacturing); and
- promotion of the use of secondary (reused) components and/or recycled materials in products, which could also promote durable design of components.

The most relevant standards in the context of this chapter are outlined in Table 7.4 below. Some researchers argue that the new standards on material efficiency can be a 'game-changer' and support future ecodesign and labelling regulations (Schlegel et al. 2019), but this remains very uncertain as there are several barriers associated with regulating specific product groups (Dalhammar et al. 2021b).

3 Treaty on the Functioning of the European Union, Article 11.

4 EC Directive 1999/44/EC.

Table 7.4: List of European standards relevant for the durability and repairability of products.

Standard	Main purpose
EN 45552:2020 General method for the assessment of the durability of energy-related products	Contains definitions of concepts such as 'durability' and 'reliability' Provides a framework comprising parameters and methods for assessing the reliability and durability of energy-related products
EN 45554:2020 General methods for the assessment of the ability to repair, reuse, and upgrade energy-related products	Defines parameters and methods relevant for assessing the ability to repair and reuse products; the ability to upgrade products (excluding re-manufacturing); the ability to access or remove certain components, consumables, or assemblies from products to facilitate repair, reuse, or upgrade; and lastly by defining reusability indexes or criteria (supporting a 'repairability scorecard')
EN 45556:2019 General method for assessing the proportion of reused components in energy-related products	Deals with the assessment of the proportion of reused components in energy-related products, on a generic level, which can be applied at any point in the life of the product
EN 45553:2020 General method for the assessment of the ability to remanufacture energy-related products	Provides a general methodology for assessing the ability to re-manufacture energy-related products and elaborates on the assessment and process of re-manufacturability in a horizontal, cross-product way – however, product group-specific standards are needed to properly assess individual product groups

7.4.2 Policies for more durable design

Some policies provide incentives for manufacturers to design more durable products. At the EU level, the Ecodesign Directive has been used to set design (functional) lifetime requirements for two product groups (for more details, see Maitre-Ekern and Dalhammar 2016):

- **Vacuum cleaners:** Rules relate to the minimum lifetime of engines (hours in operation) and durability testing of the hose; these are the two components most likely to break on a vacuum cleaner.

- **Lighting products:** Lamps have been regulated with minimum lifetime requirements related to several dimensions, including 'lamp survival factor at 6,000 hours', 'lumen maintenance' at 2,000 and 6,000 hours, 'number of switching cycles before failure', and 'colour rendering' consistency over time.

In the case of vacuum cleaners, one reason for the standards was that relevant standardisation for testing already existed, making it possible for manufacturers to prove legal compliance. Often, such testing standards are not available, which makes it difficult to introduce mandatory durability requirements. Another problem is the assessment of very long-lived products, conducted by market surveillance agencies; indeed, such items can hardly be tested for 15 years in a laboratory to mimic daily use, as once the tests were completed, the model would no longer be sold on the market (Dalhammar et al. 2021b).

Another way to incentivise more durable product design is to extend the legal guarantee period. The EU set some minimum rules for consumer guarantees, but several European countries have gone further, introducing longer guarantee periods and changes in the 'burden of proof' (Maitre-Ekern and Dalhammar 2016; Keirsbilck et al. 2020). There are, to the best of our knowledge, no evaluations done on whether these rules have the anticipated effects or not. For this policy to have the desired effect, 'R' strategies must also be the preferred remedy for product faults under guarantee (see, e.g. Svensson-Hoglund et al. 2021).

France is also planning to introduce a mandatory durability index in 2024. The idea is that the repairability index that is already in place (discussed in the next section) will be incorporated into the new durability index, together with two new criteria:

- **Reliability:** This may include aspects such as durability/robustness, correct maintenance of the product, and related consumer information, as well as requirements adapted to each product group.
- **Upgrade:** This may include aspects related to software and hardware upgrades, as well as requirements adapted to each product group (ADEME 2021).

France announced at the end of 2022 a proposal for how the scheme would work and what product groups should be covered (ADEME 2021), but the plan appears to be delayed.

An additional challenge is that some products are not even used: their commercial lifetime never starts, as they are thrown away and discarded by retailers or e-commerce actors before use (in the case of overstock and returns) (e.g. Pourhejazy 2020; Napier and Sanguineti 2018; Roberts et al. 2023). This relates to the issue of accumulation highlighted in the introductory chapter to this book. This is a tremendous waste of resources, which France in particular has started addressing by introducing a ban on the destruction of unsold goods; under Article 35 of the French Law No. 2020–105 from 10 February 2020, destruction of unsold goods is no longer permitted. The law stipulates that companies must prioritise the following actions (in line with the waste hierarchy): ensure that the products are reused (second-hand markets), redistributed (e.g. through donations), or recycled. The law covers several product groups and entered into force on 1 January 2022 for some product groups; successive regulations covering more product groups are underway (Dalhammar et al. 2022b). However, the rules do not, at this point, have a strong impact on practices due to exemptions, lack of transparency, and limited enforcement, among other factors (Roberts et al. 2023). Now, the European Commission has included transparency obligations relating to discarding and destroying unsold goods in the proposed Ecodesign for Sustainable Products Regulation that was released on 30 March 2022 (EC 2022b). Chapter VI of the proposed Regulation would require large companies to publicly disclose the number of unsold products they discard and the reasons for discarding them. In addition, the Commission sets itself the mandate of adopting delegated acts prohibiting the destruction of unsold products in certain conditions.

However, while these policies point to objectives of using and redistributing existing stocks better, there is still uncertainty about the effects of these policies in terms of overproduction and overconsumption.

7.4.3 Policies for supporting durability through 'R' strategies

In the last couple of years, many consumer NGOs and independent repairers have lobbied for R2R policies. Such policies serve a number of objectives – in particular allowing citizens to repair their products, including through independent repairers (outside the original equipment manufacturer's (OEM) authorised network), and allowing both citizens and independent repairers to access necessary repair manuals and tools and purchase spare parts. Politicians have started to support these objectives, both in the USA and the EU.

In the USA, this has led to several R2R bills being introduced at the state level. With some variations, these initiatives mainly aim to force OEMs to allow independent repairers and product owners to access manuals, tools, and spare parts (Svensson-Hoglund et al. 2021). In June 2020, New York State was the first to pass such a bill. The bill is expected to have a national effect, similar to the R2R bill for automobiles passed in Massachusetts in 2012; following the latter, the stipulations were implemented nationwide through a voluntary agreement between car manufacturers and repair service providers (Wiens 2022; Svensson-Hoglund et al. 2021). In addition, the US Federal Trade Commission has some existing rules in place that aim to protect citizens from repair restrictions; it is also considering new rules as well as enhanced enforcement (FTC 2021; Svensson-Hoglund et al. 2021).

At the EU level, the legislative solution has been to mandate producers that want to put products on the EU market to comply with specific R2R obligations. These R2R provisions have mainly been adopted for products that come under product-specific regulations within the Ecodesign Directive. Table 7.5 provides an idea of 'typical' requirements. There is a notable difference in the 'repair rights' bestowed on professional repairers compared with those that apply to non-professional repairers (e.g. DIY or community repair cafés). Non-professional repairers are not guaranteed access to the same range of information and spare parts as professional repairers. For example, common citizens and non-professional repairers are guaranteed access to spare shelves for a refrigerator, but not spare parts for the electrical components of a refrigerator; the latter are guaranteed only for professional repairers.

Table 7.5: Examples of R2R standards set under the Ecodesign Directive.

Product group	Examples of criteria applied
Refrigerators, electronic displays, washing machines, washer-dryers, dishwashers, refrigerating appliances with a direct sales function, welding equipment	**Spare parts** Making key spare parts available for all professional repairers and some parts for all users Maximum delivery time for spare parts Replacing spare parts made possible with commonly available tools Obligation to provide information on, for example, access to professional repair, ordering spare parts, minimum duration of producer guarantee, and minimum period during which key spare parts are available Information on (some of) the above should be publicly available **Information** Making repair and maintenance information available to qualified repairers Providing information on the availability of software and firmware updates (for some product groups) Making software updates available for a minimum number of years, at no, or limited, cost **Dismantling** Product design: dismantling of key components and materials should be possible with commonly available tools

Source: Dalhammar et al. 2021b.

At the national level, we have seen several interesting policy initiatives (Almén et al. 2021; Dalhammar et al. 2022b). The most notable is certainly France introducing a mandatory repairability index in 2021, which applies to five product groups so far. The index is a type of scoring system for product repairability based on five criteria: 1) how long the producer provides independent repairers and citizens with technical documentation; 2) the product's ease of disassembly; 3) the availability of spare parts in years and delivery time; 4) the price of these spare parts; and 5) sub-criteria specific to each product group (Dalhammar et al. 2022b). France has also proposed repair funds, whereby producers will pay part of the costs for repairing a product. The system is currently being set up, and the idea is that it will be organised through producer responsibility schemes (Thompson 2022). Making producers pay for some of the repair costs could provide incentives to design durable and even repairable products. However, to date, the costs and producer responsibilities

have not been high or ambitious enough to drive significant ecodesign changes (Maitre-Ekern 2021).

A national policy that can support the repair sector more directly is tax reductions for the repair sector. One example is Sweden, where the VAT rate (which is high in Sweden, at 25 per cent for most businesses) was halved from 2017 for some repairs; the government recently proposed that it should be halved again (Almén et al. 2021; Dalhammar et al. 2022a). The effect of these approaches has not been evaluated.

At the local level, two Austrian cities have introduced local repair networks, which are open to independent repairers who fulfil certain criteria (Lechner et al. 2021; Almén et al. 2021; Dalhammar et al. 2022a). When citizens undertake repairs at these repairers, they are subsidised via public funds. For instance, in Vienna, citizens can download repair vouchers online, which provide them with a 50 per cent discount on the repair cost up to a maximum amount.

Regarding reconditioning, refurbishment, and re-manufacturing, it is often hard to differentiate between these practices, so here we treat them together and generally define them as a third party (i.e. after the product's end of use) conducting a wide range of repair or preparation for reuse efforts deemed necessary in order to make the product available on the second-hand market. The EU has provided financial support to set up the European Remanufacturing Network, but it has not adopted many policies to directly support re-manufacturing and reconditioning, except for general recommendations to support such activities through public procurement. Some parts of the re-manufacturing sector, however, are growing quickly without any need for policy support, such as the re-manufacturing of cars, trucks, and heavy machinery (US International Trade Commission 2012).

At the national, regional, and local levels, re-manufacturing is supported especially through public procurement. In Sweden, the public sector can support ICT re-manufacturing by, for example, selling used computers to re-manufacturers or purchasing re-manufactured ICT products (Crafoord et al. 2018). Furniture re-conditioners and re-manufacturers have received some support through public procurement of reconditioned furniture (Öhgren et al. 2019), an approach that has recently been scaled up.

7.4.4 Current policies that act as barriers to longer lifetimes and repairs

Even though an impressive number of new policies are emerging to support longer lifetimes and the 'R' strategies, they also need to overcome many barriers. These are not only major economic barriers related to the low pricing of primary resources and business models geared towards new products, but also existing policies that hinder circular solutions. Legislation is often a key barrier for 'R' strategies such as reuse, re-manufacturing, and repair (Gustavsson et al. 2021; Hansen et al. 2021; Rizos et al. 2021; Svensson-Hoglund et al. 2021; Lindahl and Dalhammar 2022). Among the key legal barriers, we find the following:

- Current waste legislation and rules on shipment of waste make it difficult for reuse and preparation for reuse activities (including repair and re-manufacturing) of potentially functional waste products and components to occur because of the administrative burden of rules and bureaucratic procedures required to transport waste for such processes.
- Waste management targets, and the way in which producer responsibility schemes are implemented, lead to the recycling of functioning (or potentially functioning) products and components.
- If a product is refurbished or re-manufactured and is considered a 'new' product (rather than the same 'old' product), it has to comply with rules relating to the introduction of a new product on the market. Examples of such rules include taxes and chemical laws regulating content.
- Rules on substances may act as a barrier to repair, re-manufacturing, and recycling.
- Intellectual property laws – including patents, trademarks, and copyrights – often constitute barriers to repair and re-manufacturing, for instance by making it harder to reuse products or to access spare parts and repair manuals.
- In some countries, such as the Netherlands, the reuse of harvested spare parts is not allowed without certification, which is a barrier for many re-furbishers.

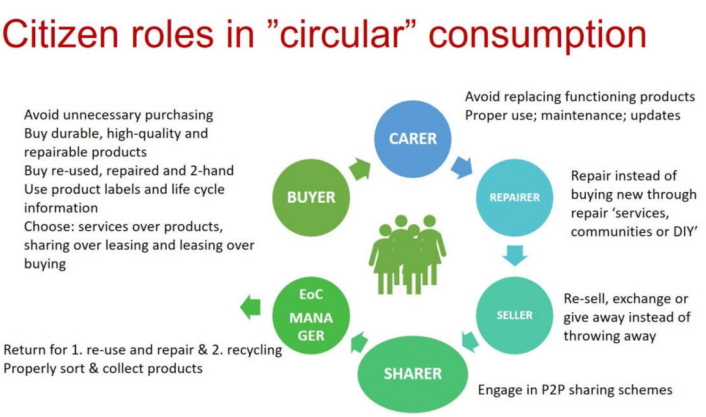
Although the EU aims to address some of these barriers with CE policy packages, current proposals do not seem sufficient to successfully overcome all the barriers that stand in the way of durability. For instance, solutions for overcom-

ing barriers stemming from intellectual property laws are still largely missing from the policy efforts.

7.4.5 Policies addressing durability and citizens

Durability is not just a question of producing longer-lasting and repairable products, it is also – and most importantly – an issue of purchase and use. The life of a durable product will be extended and have a positive environmental impact only if its user invests in it, uses it with care, undertakes repair when needed, and shares or passes on what they don't use to avoid accumulation and waste (Figure 7.2).

Figure 7.2: Citizens' roles in durable economies.



Source: Adapted from Maitre-Ekern and Dalhammar 2019; Camacho-Otero et al. 2020.

As depicted in Figure 7.2, from a durability perspective, the ideal role of the citizen is to choose to acquire fewer, more expensive, and longer-lasting products that they use for longer periods. This is crucial not only to create a demand, but also to enable durability-related activities later on in the cycle shown in Figure 7.2; for example, the repair of low-quality items is often not feasible. Moreover, citizens should avoid unnecessary purchases and instead use and care for what they already have (i.e. through repair, repurposing, or borrowing). This is also likely to be the outcome if durable products are made

more expensive. Where the acquisition of a product is necessary, citizens will prefer products that have a longer expected lifetime and can be repaired (i.e. create demand and enable the rest of the cycle shown in Figure 7.2), or they will choose items from the reuse and resale (second-hand) market (i.e. to capitalise on unused durable items, again to avoid accumulation and waste – see the arrow from 'Reselling' to 'Acquiring' in Figure 7.2).

During the use phase, the product is treated with care and maintained as needed. Unused items are ideally made available to others in the form of sharing or borrowing to maximise their utility. If the device becomes unwanted, it is passed on to others, through either informal or commercial channels. Where failures occur or products lose their function, citizens will attempt to repair them to make use of the durable properties of the product. At the end of use – when the product has become unwanted – it is put into the second-hand market directly (reuse) or, if necessary, after re-manufacturing, reconditioning, or refurbishing.

These behaviours are quite remote from the common consumption behaviour in Western countries. In a society with a free market, it is still difficult to envisage forcing citizens to adopt any given role. However, policies can be adopted that contribute to making it easier, more attractive, and more clearly beneficial to assume more sustainable roles, and less obvious, economically sound, and socially acceptable to continue with the more unsustainable ones. For example, labelling and other information can guide citizens in making decisions based not only on the price upfront, but also on long-term costs. Likewise, tax rebates for repair activities provide incentives to attempt repair rather than discarding items at the first sign of failure. However, a real break from wasteful consumption patterns and habits of accumulation and discard is bound to require going further than this, notably to address so-called rebound effects where consumers buy new products from the 'gains' made from efficiency or less replacement (Sorrell 2007). A true sustainability transition requires promoting sufficiency (i.e. reducing consumption), which demands even tougher interventions on consumer choice.

In addition, a more durable economy could be imagined as one where citizens actively participate in the value chain, from design and production (e.g. as prosumer) to technological and social innovations (e.g. repair cafés) and open source. Finally, a key aspect in changing the roles of citizens occurs through education, from kindergarten and primary school and all the way through to, and during, adult life. Currently, repair and maintenance of products that are owned are usually not the norm. This could be changing. One study shows that

Finnish citizens are increasingly seeking better alignment between their values and consumption patterns, and thus they are willing to pay more for something durable (Green and Korkman 2022). However, the emergence of a 'repair norm' seems to be absent in the field of electronics; buying a new product rather than repairing the old, broken one is still seen as the normal thing to do in wealthier nations (López Dávila et al. 2021a).

While citizens and consumer NGOs claim that people want more durable products, it is fair to question whether they are in fact willing to pay for them. People may hesitate to pay double or triple the purchase price they are used to paying or expect to pay for a very durable product, even with the promise of long-term economic gains. Generally, people do not properly calculate the 'total cost of ownership' (i.e. the cost per year, or per month, over a longer period), which would support the purchase of the more expensive product from a purely economic point of view (Dalhammar et al. 2021b). However, a higher upfront purchasing cost is difficult or impossible to meet for some consumers, thus leasing and sharing options need to be considered.

The durable economy faces a steep uphill battle; its realisation hinges on citizens and consumers overcoming the current logic of the market that too often is in contradiction with not only their personal economic interests, but also the goals of sustainability. The linear model has created a system in which individuals lack information and skills to make sustainable purchase and recovery choices. Moreover, people are often steered by habits and ideas of what is the 'common thing' to do. For the time being, resources and new products are relatively cheap (often due to cheap labour in countries where components are sourced or manufactured) and under-priced in relation to their environmental impact. On the other hand, activities such as repair are expensive in high-income countries because they are labour intensive, and salaries and labour taxes are high. Thus, it often makes more economic sense to buy a new product rather than repair the old one (Dalhammar et al. 2021b). This is exacerbated by other factors, such as the fact that a new product often comes with a three- to five-year commercial warranty, whereas warranties on repairs are usually much shorter, if they exist at all.

7.5 A critical discussion of policies and their relation to a 'durable economy' for products

Although an important focus on recent CE policies is on extending product lifetime, durability will not necessarily be achieved with upcoming regulatory changes. For example, repair is a highly prioritised strategy in CE policy developments. The proposed ecodesign regulation includes it as one of its priorities. However, design for repair may affect other aspects of durability. Whereas durability may favour gluing together the casing of a smartphone or a laptop to make them waterproof, repairability would call for using screws, which decreases waterproofness (see Chapter 8). Generally, durability and lifetime, although closely related and overlapping, are not one and the same. The broad and complex policy mix relating to the CE in the EU and in the various member states can lead to unintended effects – or rather, the expected benefits may not materialise – because other factors are not addressed properly. In this section, we therefore critically discuss some of the main points of tension in Europe's emerging sustainable product policy in light of the broader conversation about transitioning to a 'durable economy'.

In this chapter, we have established that regulators are increasingly aiming to promote longer product lifetimes, mainly for environmental reasons, through CE policies. This is very apparent in the sustainable product initiative of March 2022, which notably aims to introduce ecodesign requirements for durability, but also for upgradability and repairability. It will certainly prove challenging for the Commission to develop ecodesign requirements that will reconcile all the priorities of the future regulation.

In addition, such legal rules are effectively achieving 'choice editing', increasing the regulatory hurdles that products must pass to be allowed on the market. Corporations that are forced to redesign their products may consider changing business models – from selling to leasing or providing services, including maintenance and repair, for example – to reap the benefits of more durable design (Dalhammar 2016). Changes in business model are an expected and desirable effect of policies aimed at product durability, but the benefits for the environment will materialise only if both producers and consumers align in their behaviours. Restricting the supply of poor-performing products through regulations may prove very effective in changing design and production patterns, but they do not necessarily guarantee sustainable consumption in terms of conscious purchasing and careful use. In fact, consumers may end up behaving unsustainably with more durable products, for instance by replacing

or discarding functioning ones if they look for novelty. In that case, regulating the supply of more durable products could even be a case of over-engineering – that is, designing a product to be more robust or have more features than is typically necessary for its intended use – and this would be a waste of resources.

Changing consumption habits is hard, and there is growing recognition that information and educational measures will not be enough. Not giving consumer choice top priority appears to be necessary, along with empowering consumers in their choices. In sum, product regulation is not straightforward. Although consumer habits, business models, and markets are in constant interaction with each other, changing one variable will not necessarily lead to desired changes in others. Trade-offs must be explicitly explored and discussed in policymaking.

When it comes to norms regarding product longevity, publicly visible repair initiatives, such as repair cafés, can normalise the idea of not accepting breakage as the end of an item's life (Madon 2022). Research on consumer attitudes to repair also show that people would like to see public messaging on the importance of repair, similar to what has been done in Sweden with regard to reusable grocery bags (López Dávila et al. 2021a), a form of messaging which presumably also apply to keeping products in use for longer. The most important factor, from the perspective of policies, is perhaps how legal norms impact social norms; if the message is that innovation and the sale of new products is more important than repair – which is the case in current intellectual property laws – then the public will internalise such a mindset (see Pihljarinne 2022). Given the many barriers to the emergence of more durable consumption practices, it appears appropriate to adopt an approach of 'choice editing' for consumers, whereby legislators impose rules designed to achieve durability. Change is indeed unlikely to take place without strong policy and legal measures to lead the way.

Another important but unpopular topic is that there is a need to make products of higher quality, as well as a need for consumer products to be more expensive. This may sound counter-intuitive when we have established that people will usually make decisions based on their immediate economic interests. However, there are indications that people are better at maintaining and repairing expensive products, and that the number of repairs increases for more expensive products. Indeed, people are more willing to invest in repair for products on which they have invested money, and the repair of products is gaining traction as innovation rates slow down (e.g. for mobile phones).

In order to get and keep consumers on board, expensive products must have better guarantees to make durability and care attractive in the long term.

As for the industry's arguments that we 'price the poor out of the market', there are solutions to be pursued, including instalment contracts or leasing (Hammond and Prahalad 2009). In fact, getting access to higher-quality products would often be the best option for low-income individuals when the 'total cost of ownership' is considered (see the discussion in Dalhammar et al. 2021b). Such regulations should be combined with educational and information initiatives to make consumers more aware of product quality and its relation to environmental impacts, and to the total cost of ownership. These initiatives should possibly be combined with more visionary ideas on involving citizens in creating more sustainable products, and preparing them to better engage in maintenance and repair activities. Research shows how hard it is to change consumer behaviour; it is certainly easier to regulate the products. The question is, can worsening environmental crises wait for consumers to change their behaviour, or should regulations be used even more ambitiously?

If we are serious about transitioning to a sustainable future, the price of products should reflect their true cost, including ecological and social externalities. A green tax reform could completely change the rules of the game in current markets, making products more expensive while making labour for repair cheaper. However, this is not likely to materialise in the near future. Thus, the most viable way to achieve longer-lasting and more expensive products is to set regulations – such as ecodesign requirements – that make products higher quality and more expensive. Policies need to engage consumers and citizens in a way that stimulates consumption of fewer products of higher quality, and consumer choice should be complemented with a sense of responsibility for the products bought and for maintaining them for as long as possible. However, such a strategy is yet to emerge, and consumption patterns show no sign of changing at the pace needed to respond to the crisis we are facing.

Current policies are based on a rather 'technocratic' approach: setting standards and regulating lifetimes, making repairs more attractive, and using lifecycle assessments and economic calculations as tools for finding the right balance between benefits and costs. However, they appear to fall short of enabling a different approach to consumption and changing social norms. Striving for genuine durability requires craft and vision to create something unique. Current policies aim to support the CE by addressing a resource challenge, but they fail to fully engage with the paradigm shift necessary to achieve a sustainable

economy. Too often, current ways of designing and consuming products are unchallenged, even when there may be other ways of satisfying human needs.

7.6 Conclusion and outlook

In this chapter, we have presented the emerging policy landscape for product regulation as part of the CE, which includes a mix of very different policies, with focus on achieving durability. We have established the following points:

- Policies can address durability by addressing the lifetime of products in design or by extending product lifetimes through 'R' strategies.
- Policies are adopted at different levels (e.g. at EU, national, and local levels).
- Quite different regulatory frameworks are applied, including those relating to product legislation, criminal law, and consumer law.
- The policies address different aspects and thus different producer 'responsibilities', such as information requirements, design requirements, and requirements to support independent repair with manuals and tools.

One key finding is that policymakers are now determined to intervene in current markets, as the market has proven unable to deliver sustainable outcomes. As part of the transition to sustainability to which Europe has committed, more durable products must be placed on the market. If producers do not step up to the challenge, policymakers are showing that they will. Likewise, policymakers are increasingly intervening to end particularly unsustainable practices, such as single-use plastics. In 2019, the EU legislator banned ten single-use items as part of the EU's commitment to fight marine litter and plastic pollution.[5] In line with France's recent anti-waste legislative package, the next target for the EU is unsold products that are often destroyed, evidence that the incentives of market actors are not in line with societal objectives.

Current approaches show that policymakers increasingly engage with 'choice editing' for consumers, who can buy only the products that pass through the 'regulatory needle'. The EU ecodesign scheme effectively limits consumer choice by removing the worst performers from the market, and allows for competition to take place based on factors related to durability rather than just price.

5 Directive (EU) 2019/904.

In addition, the various indexes, labels, and other information schemes that are in place today or are about to be adopted can contribute to creating 'spill-over effects': even if people today seldom consider product durability and repairability when they purchase an item, the citizens of tomorrow may start paying more attention as they receive more and better information of this kind (Dalhammar et al. 2021b).

Regarding the intended effects of policies, most policies are recent and have not been evaluated yet. Some desired effects may be achieved for 'workhorse' products (e.g. some white goods), but policies will probably work less well for product categories where consumers look for novelty or trends. The question is whether policymakers and other societal actors should address the underlying causes: consumers' need for and expectation of 'the next best thing'. We might even start questioning some innovations per se: do we need another new version of a smartphone? Is 'fast fashion' at all justifiable?

Neither producers nor citizens can in themselves change a paradigm that has been in place for several decades. A combination of more durable products, more access to repair, and better infrastructures for reuse and other recovery activities, coupled with clear information, strengthened guarantees, and targeted incentives, can trigger a lasting change in both production and consumption patterns and bring us one step further on the road to a more durable future.

More progressive policy approaches are needed to transition to a CE that supports durability. This involves:

- considering the prospect of products becoming more expensive in order to have higher quality, durability, and repairability integrated into product design;
- considering not only the durability of products but also the durability of components, so that these might be used for repair, or as parts of modular designs that enable longer product lifetimes; and
- reviewing marketing practices, as these often promote unsustainable behaviours and choices that undermine policies for more sustainable production and consumption.

Ultimately, the important societal and political role of material wealth and product acquisition needs to be addressed as a consumption challenge. This requires sufficiency policies that address the limits of the 'consumption space' of each individual and the need to divide the Earth's resources more equally

(Raworth 2018; Hickel 2018; Newell et al. 2021; Dalhammar et al. 2022b). In a sustainable durable economy, the production of durable products would be the norm and consumption would be careful and mindful.

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