



Study to support the Commission's policy development on promoting repair of consumer goods and contracts in the data economy

Part A: Extending useful life of consumer goods.
Final report – Part A

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Contents

Abstract.....	8
List of tables	9
List of figures.....	11
Abbreviations	14
Executive summary.....	15
Synthèse	28
1. Introduction.....	43
1.1. Objectives of the study.....	43
1.2. Geographical scope	44
2. Methodological approach	49
2.1. Product selection	51
2.2. Overview of data-collection methods	52
2.2.1. Mystery shopping	56
2.2.2. Key informant interviews	57
2.2.3. Survey of businesses	60
2.2.4. 1 st consumer survey and integrated experiment.....	61
2.2.5. 2 nd consumer experiment	62
2.2.6. Internal online expert workshops.....	63
3. General assessment of a possible phenomenon of premature disposal of consumer goods	65
3.1. Problem definition	65
3.2. Overview of main drivers contributing to the problem and problem aspects	74
3.2.1. Economic drivers.....	79
3.2.2. Regulatory drivers	85
3.2.3. Psychological drivers.....	88

3.2.4. Other drivers.....	95
3.3. Scale of the problem and potential market failure	97
3.4. Evolution of the problem of premature disposal	108
3.5. Environmental impacts.....	114
3.5.1. Raw Material Extraction.....	115
3.5.2. Manufacturing.....	116
3.5.3. Use	116
3.5.4. End of Life (EoL)	116
3.5.4. Summary of environmental impacts	117
3.6. Economic impacts.....	119
3.7. Overall conclusion.....	120
4. Market analysis of repair services sector	123
4.1. Distinguishing repair, refurbishment and reuse.....	123
4.2. General assessment of market practices and value chains in the repair services sector	128
4.2.1. Repair under the legal guarantee	129
4.2.2. Repair outside the legal guarantee	136
4.2.3. Reasons for replacement or refusing repair across stakeholders	143
4.2.4. What happens with replaced goods	148
4.3. Scale and development of repair services sector	149
4.4. Scale and development of second-hand and refurbishment sectors ...	160
4.5. Overall conclusions.....	165
5. Assessing impacts of specific measures promoting longer useful life of product	167
5.1. Problem definition – summary of main findings	167
5.1.1. Problem drivers	169
5.1.2. Scale of the problem	170
5.1.3. Problem evolution.....	171
5.1.4. Problem impacts.....	172
5.1.5. Need for EU action.....	174
5.2. Policy measures promoting longer useful life of products	178
5.2.1. Baseline scenario	178
5.2.2. Policy measures (exhaustive list)	183
5.2.3. Discarded measures	194
5.3. Assessing impacts of retained policy measures.....	198
5.3.1. Screening of impacts.....	199

5.3.2. Impacts of the policy measures and how they compare..... 204

5.3.3. Combined package of measures..... 228

5.3.4 Monitoring and evaluation plans..... 234

References 236

Abstract

This document is the final report for Part A of the 'Study to support the Commission's policy development on promoting repair of consumer goods and contracts in the data economy'. The study was contracted under the Framework contract n° JUST/2020/PR/03/0001 on Evaluation, Impact and Compliance Assessment, Policy Support and Legal Analysis Services. The objective of the study was to contribute to the Commission's work focused on fostering consumers' role in sustainable consumption by encouraging repair and reuse of goods consumers purchase. More specifically, the objective was to ascertain whether consumers dispose of consumer goods prematurely and if so, what the causes and consequences of this potential problem are. The study analyses and compares a number of measures that could potentially address this problem.

The study is based on desk research / literature review, consumer survey, behavioural experiments, mystery shopping with traders, business survey and interviews.

The study was conducted by Kantar Public in partnership with Ramboll, Behavia and Milieu.

List of tables

Table 1: List of policy measures considered	22
Table 2: List of impacts assessed	26
Tableau 1 : Liste des mesures politiques envisagées	36
Tableau 2 : Liste des impacts évalués	41
Table 1: Selected countries according to geographical diversity	46
Table 2: Country sample representativity against selection criteria.....	47
Table 3: Country selection against all criteria used for sample selection	48
Table 4: Overview of data collection tools	54
Table 5: Overview of mystery shopping observations per country and product	56
Table 6: Overview of mystery shopping observations per product and scenario	57
Table 7: Selection of expert stakeholders and organisations who provided input to this project during the first wave of interviews	58
Table 8: Selection of expert institutions who provided input to this project during the second wave of interviews	59
Table 9: Short profile description of the experts' profile for the consultative group	63
Table 10: Overview of the problem of premature disposal in the product categories assessed	66
Table 11: Relevant drivers per selected product category	76
Table 12: Overview of available data providing an indication about the scale of the problem	99
Table 13: Propensity of consumers to always or probably have a product replaced/repared for selected product categories and MS based on results of the consumer survey.....	99
Table 14: Share of consumers who replaced or repaired their products in the event of a defect in different MS for selected product categories based on results of this study's consumer survey	100
Table 15: Perception of the repair market at the MS level based on results of the consumer survey.....	101
Table 16: Overview of yearly arising of environmental impacts associated with the premature disposal of products. This data represents the sample of products chosen for the purpose of this study.	104
Table 17: Overview on the scale of the environmental problem on a yearly basis (represented year: 2019) (The colour code reflects a ranking of the potential savings among the product groups whereby red is the highest saving potential and green the lowest saving potential)	105
Table 18: Overview of product-specific conclusions on the future evolution of the problem	109

Table 19: Overview of the assumed relevance of impacts connected to the use phase	116
Table 20: Qualitative synthesis of environmental impacts throughout the life cycle of products	117
Table 21: Definitions for Repair, Reuse, Preparation for reuse and Refurbishment.	123
Table 22: Definitions for different types of repairs:	129
Table 23: Connection between the statistical classification NACE Rev 2 Division (Eurostat, 2021b) and G45 and the products selected for the purpose of this study.	149
Table 24: Key indicators of computer and personal and household goods repair statistics (NACE division 95) and repair and maintenance statistics of motor vehicles (G45.20) EU, 2018. Adapted from (Eurostat, 2021b) and (Eurostat, 2021a)	150
Table 25: Overview on the conclusions concerning the problem of premature disposal in the product categories assessed	167
Table 26: Summary of estimated economic impacts of the problem per stakeholder group (EU only) and per type of product, 2023-2037 (comparison to the 'optimal scenario')	172
Table 27: Baseline for environmental impacts: current savings (products, CO ₂ , resources, waste savings) due to repair projected for the next 15 years (2023-2037).	182
Table 28: Exhaustive list of policy measures considered	185
Table 29: Significance of impacts for all the policy measures considered for in-depth assessment	200
Table 30: How impacts help measure effectiveness, efficiency, and coherence	204
Table 31: Summary of assumptions made, and data used to assess impacts	208
Table 32: Overview of measures' significant impacts based on an MCA analysis (Part 1): Measures within the legal guarantee (concerning new refurbished goods)	225
Table 33: Overview of measures' significant impacts based on an MCA analysis (Part 2): Measures beyond the legal guarantee (concerning new and refurbished goods)	226
Table 34: Summary results of the MCA	228
Table 35: Impacts of combined package of options	228
Table 36: Monitoring indicators	234

List of figures

Figure 1 - Problem drivers.....	17
Figure 2 - Causes du problème.....	31
Figure 3 - Mapping of study tasks against the steps of an impact assessment + overview of study data collection methods.....	50
Figure 4 - Overview of data collection methods deployed in this study	53
Figure 5 - Perceived time until a defect occurs in each of the product categories assessed within this study.....	69
Figure 6 - Experience of defects in the past in each of the product categories assessed within this study.....	69
Figure 7 - Share of respondents across all products according to what they did when a product got defect (n=9928)	70
Figure 8 - Share of respondents according to what they did when a product got defect by product category (n=9928).....	70
Figure 9 - Share of respondents according to why they did not have their product replaced (n=5653)	72
Figure 10 - Respondents' attitudes to second-hand and refurbished products (n=10,144).....	72
Figure 11 - Importance of the option of buying a product second-hand or refurbished rather than a new product for consumers.....	74
Figure 12 - Willingness to pay for repair per product category assessed within this study.....	81
Figure 13 - Repair cost relative to initial price	81
Figure 14 - Effect of an extended guarantee period on consumers' willingness to pay for used products	94
Figure 15 - Percentage of defective products which are repaired when brought to businesses by consumers	98
Figure 16 - Perception of the repair market among consumers	111
Figure 17 - Features currently considered as being most important when designing a product as indicated by manufacturers in the business survey	113
Figure 18: Features which will become the most relevant in the next decade when designing a product as indicated by manufacturers in the business survey	113
Figure 19 - Approach when assessing environmental impacts of a product category	114
Figure 20 - Graphical and simplified description of the concepts repair, refurbishment, and (direct) reuse for the purposes of this study	124
Figure 21 - Typical repair steps.....	126

Figure 22 - Typical refurbishment steps, compiled with input from different source and stakeholders.	127
Figure 23 - Comparing refurbished goods with second-hand goods, to what extent do you agree or disagree with each of the following statements?	128
Figure 24 - Relationship between repair actors taking care of defective products under the legal guarantee	132
Figure 25 - Relationship between repair actors taking care of defective products outside legal guarantee but within a commercial guarantee from manufacturer	133
Figure 26 - Sellers' first reaction to the product defect per product (within legal guarantee) (n= 600)	134
Figure 27 - Repair options offered under legal guarantee (n = 600).....	135
Figure 28 - Relationship between repair actors taking care of defective products being outside legal guarantee but within commercial guarantee from insurances	137
Figure 29 - Relationship between repair actors taking care of defective products outside legal and commercial guarantee	138
Figure 30 - Sellers' first reaction to the product defect per product (outside legal guarantee) (n= 600)	140
Figure 31 - Repair options offered outside the legal guarantee (n= 600)	141
Figure 32 - What happens with defective products	144
Figure 33 - Seller refusal for repair under legal guarantee	146
Figure 34 - Extent to which shoppers were offered with a repair solution within (scenario 1) and outside the legal guarantee (scenario 2)	147
Figure 35 - Repair of computers and personal and household goods: Number of people employed by enterprise size class, 2018 (as % of total employment). Dark blue: small enterprises; Orange: medium enterprises; light blue: large enterprises.	151
Figure 36 - Sectoral analysis of computer and personal and household goods repair statistics (NACE division 95), EU, 2018) – Monetary values	153
Figure 37 - Number of people employed and number of enterprises according to repair activities within the sector 'Repair of computers and personal and household goods'	154
Figure 38: Development of the number of employees and the number of people employed within the sector of repair of computers and personal and household goods (2011-2018, EU27).	156
Figure 39 - Development of the number of employees and the number of people employed within the sector of repair and maintenance of motor vehicles (2011-2018, EU27).	156
Figure 40 - Development of the number of enterprises within different repair sectors (2011-2018, EU27).....	157
Figure 41 - Development of different financial key indicators within the sector of repair of computers and personal and household goods (2011-2018, EU27). 157	

Figure 42 - Development of different financial key indicators within the sector of repair and maintenance of motor vehicles (2011-2018, EU27).	158
Figure 43 - Projection of the second-hand market for clothing	161
Figure 44 - Consumer reasons for not buying a used product	163
Figure 45 - Consumer responses on the question if they have ever sold or considered selling used products that they owned	165
Figure 46 - Consumer journey – when can consumers be nudged to repair? .	178
Figure 47 - Intervention logic	184
Figure 48 - Effect of the alignment of the liability period for used goods on consumers' willingness to pay for a used product	196

Abbreviations

B2B	Business-to-business
B2C	Business-to-consumer
BRG	Better Regulation Guidelines
CBA	Cost-benefit Analysis
CE	Circular Economy
CEAP	Circular Economy Action Plan
CRT	Cathode ray tube
CSR	Corporate Social Responsibility
DIY	Do-it-Yourself
ECGT	Empowering Consumers in the Green Transition
ELV	End-of-life vehicles
EoL	End of Life
ESPR	Ecodesign for Sustainable Products Regulation
EU	European Union
EuP	Energy-using products
FTE	Full-time equivalent
GHG	Greenhouse gas
GWP	Global warming potential
LCA	Life Cycle Assessment
LCD	Liquid-crystal display
MCA	Multi-criteria Analysis
MS	Member States of the European Union
OEM	Original Equipment Manufacturer
PLATE	Product Lifetimes and The Environment
POP	Persistent organic pollutants
SGD	The Sales of Goods Directive
SPI	Sustainable Products Initiative
SSD	Solid-state drive
TEU	The Treaty of the European Union
TFEU	The Treaty on the Functioning of the European Union
TV	Television
WFD	Waste Framework Directive

Executive summary

Large volumes of valuable natural resources are lost every year in the EU because repairable products are replaced rather than repaired. This results in unnecessary waste and CO2 emissions linked to the production of new replacement products, which could have been avoided through repair. Part of this problem is linked to the behaviour of manufacturers and sellers (repairability of products, availability of spare parts). Another part of this problem is linked to the immaturity of the repair market (availability of repair and incentives for repair) and part is linked to consumer preferences (preference for new products versus repair). This study analysed the problems linked to the insufficient rate of repair in the EU which are not linked to the manufacturing process (and repairability in general) and availability of spare parts. These are tackled through other EU initiatives which are discussed in the study. Instead, this study focused on assessing issues related to consumer choices when their products become defective during or outside the legal guarantee period, and choices made by sellers when consumers bring their defective products back to the shop under legal guarantee. The study analysed the existing problems, their drivers and consequences. It then analysed specific measures based on a list initially provided by the European Commission DG Justice and Consumers. Subsequently, the economic and environmental impacts of these measures were assessed using modelling. A comparison with the baseline allowed to identify additional benefits that these measures would deliver compared to the expected evolution over the next 15 years without additional action.

This study was carried out to support the European Commission DG Justice and Consumers in its preparation of the impact assessment about the so called “right to repair” initiative with the objective to promote the repair of consumer goods. The study focused on the analysis of the problem and the assessment of impacts of proposed policy measures to address these problems.

Study methodology

The study followed the Better Regulation Guidelines and associated toolkit in the overall approach to the impact assessment.

The primary data collection comprised the following sources of data:

- Online consumer survey with an integrated behavioural experiment with a sample of 10,144 respondents carried out in 10 Member States (MS);
- A second online behavioural experiment with a sample of 8,032 respondents also carried out in 10 MS;
- A survey of businesses which were either manufacturers, sellers (retailers) or repairers of products covered in the data collection. The survey was fully completed by 88 respondents and 72 respondents provided partial responses. Hence 160 respondents answered questions of which at least part was used for the study;

- 600 mystery shopping observations in which the mystery shoppers were acting as if they had a defective product so as to identify whether repair or replacement is offered by the seller and how this choice is explained;
- In addition, 21 expert and stakeholder interviews were conducted.

This complemented the secondary data collection - desk research and literature review - carried out in the first phase of the study.

The assessment of impacts of the policy measures and their clustering into options was done using an environmental and an economic model, which combined data from the primary data collection with data from desk research and literature review. The purpose of these models was to estimate the effects of the current situation and of the proposed measures on economic and environmental indicators (see below).

The primary and secondary data collection focused on a sample of popular consumer product categories that were selected based on specific criteria. These product categories were: mobile phones/smartphones, televisions, refrigerators, laptops, clothing, shoes/footwear, cars and wooden furniture. The study ultimately focused on horizontal findings applicable to most consumer goods available on the market. Where relevant, product-specific analysis is provided in the main study.

Assessment of the problem and its main drivers

The problem at the core of this study was the premature disposal of viable and repairable goods. The study showed that product defects occur relatively early in product lifecycle and that a majority of consumers have a preference for replacement rather than repair in the current situation. A quarter of respondents in the consumer survey stated that, for the specific product categories they were asked about, a defect occurred within the first two years of a product's lifetime. **Nearly two thirds (65%) of consumers would always or probably have a product replaced compared with only 31% who would probably or always have it repaired**, though there were significant differences between product categories. For certain product categories such as cars, repair is much more common than for others such as footwear or mobile phones.

The analysed phenomenon of obsolescence is a multifaceted one. Planned obsolescence (intentionally shortened product lifetime) was not in the scope of this study. Instead, the study looked at stylistic obsolescence (when a viable product is discarded because it is out of date) and economic obsolescence (when the purchase of a new product is more economically attractive than repair). These two categories were of interest to this study, as they affect consumers' preferences between the options of repair and replacement.

The two main sub-problems that the study analysed were:

- **Goods are not used for as long as they could** because they are not being repaired. In the consumer survey only a third of consumers had a defective product repaired, while 12% repaired it themselves. Nearly a third on the other hand replaced the product.

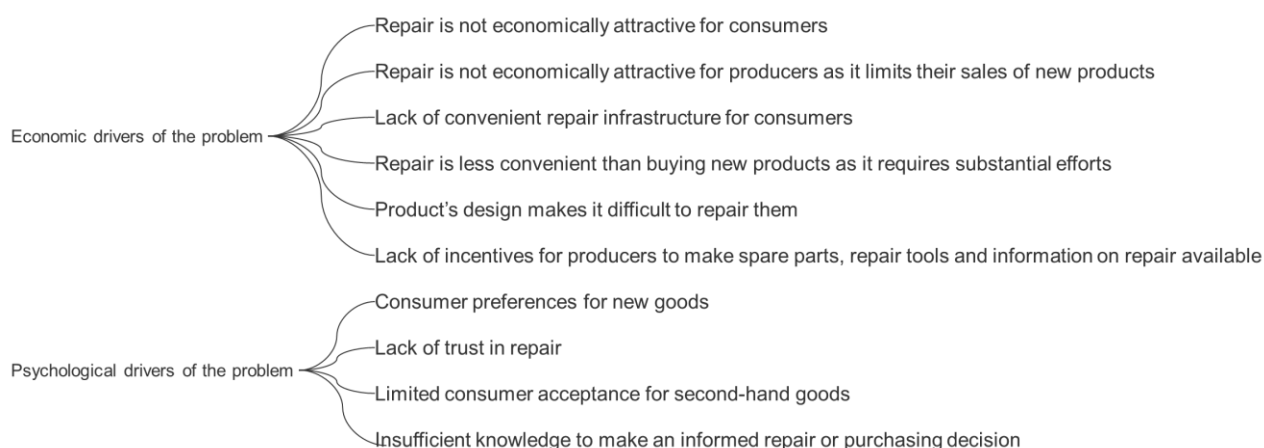
- **There is limited use of second-hand goods by consumers.** There is a lack of incentives to buy second-hand goods and availability of second-hand goods seems limited. Over half of respondents to the survey always prefer buying new products to repaired or refurbished ones which they see as having issues and being of inferior quality.

The study recognised that for different product categories the importance of the above phenomena will vary. The factors influencing the purchase of new products, or repair of products is highly dependent on the product category (e.g., shoes compared to washing machine).

The main drivers of the problem of premature disposal of goods are on the one hand economic and on the other hand psychological as shown in figure below. The most salient drivers are:

- Over a third of respondents who had a defective product that they did not repair, state that high costs of repair were the reason for non-repair;
- One in five respondents state they have a preference for a new product which is the reason why they did not repair defective products;
- Low reparability of products by design is a strong driver according to expert interviews and also one in 10 respondents quote it as reason for non-repair;
- The efforts needed for repair, notably in terms of searching for a repairer and getting a quote for repair, strongly varied as a reason for non-repair between product categories, with wooden furniture and clothing often being affected by this, but for smartphones much less; and
- Lack of convenient repair infrastructure. This was cited by more than one in 10 respondents as reason for non-repair.

Figure 1 - Problem drivers



The rate of repaired (as opposed to replaced or discarded) defective goods by producers when a product is returned to them is rather low, for instance due to due to expensive logistics and repair costs.

The study concluded that the premature disposal of goods reduces the consumption lifetime and has significant negative economic and environmental

impacts. The premature disposal of products leads to a sub-optimal use of resources associated with the production of goods (i.e. resources wasted) and to CO₂ emissions and waste generated. The study estimated that 3.6 million tons of resources are wasted due to premature disposal of goods leading to 30 million tonnes of CO₂-eq. This is equivalent to waste of 4.8 million of tonnes which corresponds to the waste generated by some 14.5 million Europeans (3.2% of EU's population). In other words, premature disposal significantly contributes to the generation of waste as well as carbon footprint.

The market failure addressed through the study is estimated as a loss in consumer welfare (i.e. consumer detriment) that the premature disposal of goods causes. This is the combined cost of products that consumers are obliged to purchase anew because they cannot repair the defective products they have. The estimation of existing consumer detriment amounts to EUR 5.1 billion per year. This is likely to be an underestimate, as only the welfare losses to people who wanted to repair a product but could not, were reflected.

The problem drivers described above are not static and continue evolving. However, the developments in the market and among consumers are highly varied per product category. The study concluded that none of the developments identified can be expected to reduce the problem of premature disposal to an extent which would lead to the elimination of the problem. For most of the product categories assessed, consumer behaviour concerning the repair and replacement of products is more likely to remain unchanged if the market for repair services continues to be as it is today. The increasing relevance of the second-hand market for electronics suggests that more of these products will be refurbished in the future, contributing to an increase of the market for second-hand and refurbished electronics. This is assumed to reduce the problem of premature disposal of electronics and electrical devices, although the extent is unknown.

Market analysis of repair services

It was found that for all eight product categories selected for the purpose of this study, repair and reuse structures exist. However, many repair activities are still very expensive (for example the replacement of a mobile phone screen).

When a product shows a defect that was present since delivery within the legal guarantee, the claim can be made towards the seller. However, in practice the legal guarantee often overlaps with the commercial guarantee offered by the manufacturer. In these cases, the seller directs the repair to the manufacturer or to sub-contracted repairer networks. In-house repair from manufacturers is rare today; however, the manufacturer often ends up paying for the repair (under the commercial guarantee or under the legal guarantee based on business-to-business agreements with sellers), and provides the spare parts. Due to expensive logistics and repair costs, manufacturers and sellers often prefer replacement over repair.

When the product breaks outside the legal guarantee, consumers must bear the costs of the repair. If the manufacturer offers repair beyond the guarantee, they might use the same infrastructure as under the guarantee to provide repair. Outside guarantees,

consumers can perform self-repair, visit a repair café, or turn to an independent or an authorised repairer. Local repair shops seem to be the consumers' favourite option (between 25% and 53% of consumers prefer it, depending on the product).

For certain products (e.g., shoes, refrigerators) the amount of repair activities has decreased over the last few years, whereas repair activities for electronics increased. Although the repair market seems to have been quite stable over the last 10 years, before 2014 a decline, and after 2014 a slight recovery could be observed.

Many barriers still hinder the development of a fast-growing repair market. According to stakeholders, one of the most striking barriers is the non-availability of spare parts.

Need for EU action

The analysed problem, its drivers and impacts show that there is a market failure related to repairing products. This market failure requires regulatory action. One of the identified drivers includes the lack of an appropriate regulatory framework to allow consumers to get defective products repaired at reasonable prices, mainly outside the legal guarantee. The lack of information to consumers about the reparability and sustainability of products they purchase has recently been dealt with by EU legislation adopted in March 2022 on Empowering Consumers in the Green Transition.¹ The initiative aims to ensure that consumers obtain reliable and useful information on products, such as on their lifespan and repair options, aims to prevent greenwashing and set minimum requirements for sustainability logos and labels.

Throughout the product lifetime, the pre-existing and parallel policy measures may help to extend the life of consumer goods. However, most measures are implemented at the design/manufacturing stage (e.g., Sustainable Products Initiative) or at the pre-contractual stage, when a consumer decides to purchase a product (Empowering Consumers in the Green Transition). In the after-sales phase, in the event of a product defect, the consumers are protected by the legal guarantee and can get their products repaired or replaced by the seller or rely on commercial guarantees by the manufacturer (if these exist). Consumers can also resolve the issue at their own cost in case the situation falls outside the legal (or if relevant, commercial) guarantee. Hence, none of the current measures in the manufacturing phase, pre-contractual phase or after-sales phase encourages consumers directly to repair their goods in the event of a defect.

The study identified in the consumer journey, potential 'hot spots' when consumers could be convinced to repair their defective goods and factors that could influence this decision. The understanding of these possibilities was used to develop a set of measures that could potentially improve the repair or use of second-hand goods both within and outside the legal guarantee.

¹ Available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12467-Consumer-policy-strengthening-the-role-of-consumers-in-the-green-transition_en

In order to provide a solution to the problem, legal and/or non-legal action is needed. This study shows that consumers, producers, and sellers will not change their behaviour if the regulatory framework does not provide for certain conditions.

Baseline scenario

The baseline is a necessary comparison to assess the expected performance of the proposed measures. The dynamic baseline in this study used a 15-years' timeframe. This dynamic baseline uses current repair rates obtained from the consumer survey – both under and outside the legal guarantee. It considers improvements over the next 15 years, which are driven by EU initiatives that have already been adopted. In addition, the dynamic baseline takes into account the projected market developments of the selected product categories over the next 15 years. It projects the future volume of successfully repaired consumer goods in the EU on the basis of historic data. This is important as the number of goods repaired (a key factor for the estimation of economic and environmental impacts) is directly related to the quantity of products sold.

To calculate the environmental savings from repairs, the products that do not need to be bought (and thus newly produced) due to repairs, were taken as the basis. The environmental savings are then equal to the amount of CO₂, waste and resources that would have been generated in the production and disposal of these new replacement products.

The number of repaired products does not necessarily correspond to the number of products that do not have to be bought new. Therefore, the number of repairs was discounted by two factors:

- The first factor in the baseline reflects the ratio between the absolute lifetime of a product and the average lifetime extension due to repair. An example explains why this ratio is relevant for environmental savings: A product has an absolute lifetime of 3 years. Repairing it extends the lifetime of this product by one year, but after this period a new product is purchased. Consequently, the environmental benefit is not that of a complete product, but that of a third of a product (1/3).
- The second reduction factor reflects the rate of defects that reappear immediately after repair. It is assumed that products that break immediately after repair do not contribute to savings and are therefore not considered as products that do not have to be bought new due to repair.

The dynamic baseline first made an assessment based on the products that were examined in depth in the study and subsequently the estimates were extrapolated to the whole economy.

In the baseline scenario, due to repair, an equivalent of 1,584 Mio products being put on the market will be avoided. This equals to 47 Mio tonnes of CO₂-eq., 5 Mio tonnes of resources and 8.7 Mio tonnes of waste that are saved due to repair leading to

reduced premature disposal. These numbers are extrapolated to the whole economy and all relevant repairable consumer durables.

The total production value of these products will be EUR 10.7 trillion at producer prices for the relevant (repairable) consumer durables sold in the EU between 2023 and 2037, taking anticipated market growth into account. This was extrapolated to cover all repairable consumer durables. Of this amount about EUR 4.1 trillion worth of goods will be manufactured in the EU. This volume corresponds to over EUR 16 trillion of retail sales volume (calculated at retail prices).

The economic model subsequently calculates the economic value of production (including that produced in the EU), products replaced and those repaired in the baseline and their value. Resulting values are used in the rest of the impact assessment to estimate consumer savings and economic gains.

This data was used as baseline to examine how much more savings can be achieved if policy measures are introduced to promote repair and refurbishment.

Policy measures promoting longer useful life of products

In line with the Better Regulation Guidelines the study developed and examined a number of granular policy measures. These were all compared to the baseline scenario.

The measures examined in depth in this study were the ones listed in the table below. The measures discarded at an early stage are not shown here but are presented in the core of the report.

Table 1 - List of policy measures considered

Description of the measure		Assumption on what it should achieve	Addressees	Within / outside legal guarantee
M1 <i>Repair as the primary remedy</i>	The remedies system of the SGD gives consumers a right to choose between repair or replacement if the product they bought turns out to be defective within the liability period (of at least two years). Under this option the consumer would be only able to ask to replace the product within the legal guarantee period, if repair is not possible or would impose disproportionate costs on the seller.	Limit product replacement in cases where repair can be carried out and would not impose disproportionate costs on the seller	Sellers	Within legal guarantee
M2 <i>Preference for repair in the proportionality test</i>	The measure limits the consumer choice to repair instead of replacement in all cases where repair is cheaper or as costly as replacement. The consumer will be able to request replacement only if repair is more expensive than replacement.	Limit product replacement in cases where repair can be carried out and would not impose disproportionate costs on the seller	Sellers	Within legal guarantee
M3 <i>Interruption/Suspension of the legal guarantee period</i>	During the legal guarantee period, consumers can choose whether they would like to have their defective product replaced or repaired, but they could be provided incentives to choose repair by interrupting or suspending the legal guarantee period. Interruption means that the legal guarantee period starts anew once the remedy is offered. Suspension means that if the consumer decides to repair a defective product instead of replacing it, the duration of the liability period could be extended for the time of the repair.	Make repair more attractive to consumers by extending the duration of the legal guarantee when repair is chosen	Consumers	Within legal guarantee
M4 <i>Extending the legal guarantee period</i>	The SGD provides for an obligatory minimum 2-year period during which the seller is liable for a lack of conformity which existed at the time of delivery. This measure would extend the duration of the legal guarantee period beyond the current minimum two years for new goods.	Extend the timeframe within which consumers can choose	Sellers	Within legal guarantee

Description of the measure		Assumption on what it should achieve	Addressees	Within / outside legal guarantee
		remedies of repair or replacement		
M7 <i>Aligning the liability period of refurbished second-hand goods with that of new goods</i>	Current rules under the SGD provide a possibility for MS to allow consumers and sellers to agree on a shorter liability period for second-hand goods (however not less than 1 year). The current exception could be maintained partially for second-hand goods. However, MS could not allow consumers and sellers to agree on a shorter liability period for refurbished goods.	Increase the use of refurbished goods among consumers	Sellers of refurbished goods	Within the legal guarantee
M8a <i>Replacement with refurbished goods in the extended liability period</i>	This measure envisages a combination with the measure on prolonging the liability period in context of repair (M3). The replacement with refurbished goods would be an alternative remedy to repair in cases where repair is impossible or causes excessive costs. This measure would only apply in the additional liability period going beyond the minimum liability period of two years (or more depending on MS regime). This measure would not apply in the first two years of the liability period as the consumer may expect as fair replacement only the replacement with new goods during that period. After two years, replacement with refurbished goods – where available – could be justified as the goods have already been in use for a considerable time.	Reduce replacement rates of new goods and increase use of refurbished goods	Sellers	Within legal guarantee
M8b <i>Replacement with refurbished goods from the second year of the liability period</i>	To boost the use of refurbished goods even more, this measure would allow sellers to offer refurbished goods as replacements from the second year of the liability period. When one year has passed, many products are likely to show signs of wear and tear. It could thus be considered as fair to grant the seller the additional possibility of replacing the defective product with a refurbished good, if available.	Reduce replacement rates of new goods and increase use of refurbished goods	Sellers	Within legal guarantee
M9a <i>Right to repair (Ecodesign only)</i>	The measure would consist of the introduction of a right to repair for consumers for ecodesign products. Under such a right to repair, the consumer would be able to ask the producer to have the defective product repaired for a reasonable price for a determined period of time beyond the legal guarantee period. As opposed to previous measures, this right would apply to cases when the repair under the SGD is not available. This means that it would cover defects that appear after the legal guarantee period has expired but also those that appear during	Increase repair of consumer goods outside the legal guarantee, but also defects that occur during the legal guarantee that	Producers of Ecodesign products (manufacturers, importers)	Outside legal guarantee

Description of the measure		Assumption on what it should achieve	Addressees	Within / outside legal guarantee
	the legal guarantee period but are not covered by the SGD. The measure would apply to repairable ecodesign products (in the scope of the Ecodesign Directive ² and subsequently, ESPR).	are not covered by the SGD		
M9b Right to repair (all products)	Same as M9a but applicable to all products.	Increase repair of consumer goods outside the legal guarantee, but also defects that occur during the legal guarantee that are not covered by the SGD	Producers of any products (manufacturers, importers)	Outside legal guarantee
M11 Issuing a repair quote	The entity providing repair services (e.g. producer/seller/repairer) would be required to issue a repair quote upon consumer's request. The repair quote should be provided in a standardised form and should comprise certain information such as the duration of repair, any commitment on quality of repair and the cost of repair.	Increase repair of consumer goods outside the legal guarantee by providing more information to consumers about the repair conditions (e.g. where to repair and the costs of repair)	Repair services and manufacturers/sellers offering repair	Outside legal guarantee
M12 Obligation to inform where to repair	Building on a precedent in sectorial EU legislation, this sub-option envisages a horizontal information obligation on producers to inform on available professional repair services. The objective is to facilitate consumer access to information and help identify a suitable repairer for a given product. Such information can be provided at a limited cost by means of references to internet webpages, addresses and contact	Increase consumers' awareness about the possibility to repair their goods	Producers of any product (manufacturers, importers)	Outside legal guarantee

² The obligation to repair could apply to products for which reparability requirements in Eco-design implementing regulations exist or will be adopted

Description of the measure		Assumption on what it should achieve	Addressees	Within / outside legal guarantee
	details of repairers, placed on a free access website, which should be up-dated regularly. This obligation can apply to the manufacturer as provided for in the existing sectoral EU ecodesign rules.			
M13a <i>Platform with information on available repair services (national level)</i>	This sub-option entails the creation of an online platform with a search engine, matchmaking consumers with repairers for key consumer goods at national level. The purpose is to facilitate the search of suitable repair services and provide more transparency on conditions of repair in order to incentivise consumers to choose repair. This would be an independent comparison tool helping end-users to assess the merits of different repair providers by means of standardised information facilitating comparison of prices and quality parameters.	Increase repair of consumer goods outside of the legal guarantee by providing more information to consumers about where to repair and how much it would cost	Repair services	Outside the legal guarantee
M13b <i>Platform with information on available repair services (EU level)</i>	This sub-option entails the creation of a single online platform at EU level with a search engine matchmaking consumer with repairers for key consumer goods. As M13a, the purpose is to facilitate the search of suitable repair services and provide more transparency on conditions of repair in order to incentivise consumers to choose repair. The most efficient implementation would be adding new functionalities to the EPREL portal for energy labelled products.	Increase repair of consumer goods outside the legal guarantee by providing more information to consumers about where to repair and how much it would cost	Repair services	Outside legal guarantee
M14 <i>Voluntary commitments to an EU common 'easy repair standard'</i>	This option involves a voluntary commitment to observe a European standard of quality in repair services. The rationale of a standard at EU level is to boost consumer trust in repair services across the EU on the one hand and avoid market barriers for business on the other hand.	Boost consumers' trust in repair services and avoid market barriers for businesses	Repair services and manufacturers/sellers offering repair	Outside the legal guarantee

Assessment of impacts

All measures were assessed and compared based on the same set of criteria, namely the impact they are expected to have on the indicators presented in table below. The assessment of impacts used two main models: model assessing the environmental impacts and a model assessing the economic impacts which utilised also the outputs from the environmental model.

Table 2 - List of impacts assessed

	Type of assessment
Consumer trust and protection	Qualitative
Consumer decision making process (willingness to repair)	Quantitative
Consumer savings	Quantitative
Growth and investment	Quantitative
Savings in production costs for manufacturers	Quantitative
Business adjustment costs	Quantitative
Business administrative costs	Quantitative
Change in employment	Quantitative
Impacts on public administration (enforcement costs)	Quantitative
Contribution to fighting climate change	Quantitative
Fostering the efficient use of resources (renewable & non-renewable)	
Waste production, generation, and recycling	
Coherence with other EU legislation	Qualitative

The expected effects of each of these measures that are under and outside the legal guarantee on these indicators are shown in Chapter 5.3. The study also assessed the impacts for the combination of measures:

- M2 - Preference for repair in the proportionality test
- M9a - Right to repair (Ecodesign only)
- M11 - Issuing a repair quote
- M12 Obligation to inform where to repair
- M13 - Platform with information on available repair services
- M14 - Voluntary commitments to an EU common 'easy repair standard'

The most significant combined effects of these measures are estimated to be the following:

- A gain in the net financial position of consumers of EUR 176,5 billion over 15 years (consumer savings due to avoidance of new purchases).
- European producers would see a net cost reduction of EUR 15.6 billion due to avoiding the production of products that were previously replaced and which will be repaired.
- The shift towards repairing products will also result in fewer new products being sold. This loss in revenue from the selling of new products is estimated to be

around EUR 4.3 billion for EU manufacturers, corresponding to a loss in GVA of EUR 1.0 billion.

- The change in turnover (due to loss of sales) in the European distribution sector (importers, wholesale, and retail of new as well as refurbished products included) would amount to an estimated EUR 40.4 billion over 15 years. Using average Eurostat figures on the economic structure of the sector, we can calculate a loss in GVA among sellers amounting to EUR 10.9 billion.
- The repair sector revenues will be expanding by EUR 44 billion. This translates into an additional EUR 16.7 billion in GVA produced in the sector.
- The total one-off adjustment costs to businesses are estimated to reach EUR 731 million. Recurring costs of about EUR 8.0 billion for the 15-year time period are also expected: a large part of this concerns M11 relating to the ongoing costs for the provision of quotes.
- CO2 savings of 18.5 Mt CO2 equivalents are expected over a 15-year period.

Synthèse

Chaque année, de grandes quantités de ressources naturelles précieuses sont gaspillées dans l'UE parce que des produits réparables sont remplacés au lieu d'être réparés. La fabrication des produits de remplacement neufs génère des déchets et des émissions de CO₂ inutiles, que la réparation aurait permis d'éviter. Ce problème est lié, entre autres, au comportement des fabricants et des vendeurs (réparabilité des produits et disponibilité des pièces de rechange). Toutefois, il s'explique également en partie par l'immaturité du marché de la réparation (offre de réparation existante et incitations à la réparation) et par les préférences des consommateurs (attrait pour des produits neufs plutôt que pour la réparation). La présente étude a analysé les problèmes posés par le taux de réparation insuffisant dans l'UE dans la mesure où le processus de fabrication (et la possibilité de réparation en général) et la disponibilité de pièces de rechange ne sont pas en cause. Ces aspects font l'objet d'autres initiatives de l'UE, qui sont également abordées dans cette étude. En l'espèce, il s'agissait plutôt d'examiner les implications des choix opérés par les consommateurs lorsqu'un produit devient défectueux au cours de la période de garantie légale ou en dehors de cette période, et des choix opérés par les vendeurs lorsqu'un consommateur leur rapporte un produit défectueux au titre de la garantie légale. L'étude a ainsi analysé les problèmes rencontrés, leurs causes et leurs conséquences, puis elle s'est intéressée à une liste de mesures spécifiques établie par la DG Justice et consommateurs de la Commission européenne. Elle a ensuite évalué les répercussions économiques et environnementales de ces mesures par modélisation. Une comparaison avec la situation actuelle a mis en lumière les avantages supplémentaires que ces mesures procureraient par rapport à l'évolution probable au cours des quinze prochaines années si aucune mesure n'était prise.

Cette étude a été menée pour aider la DG Justice et consommateurs de la Commission européenne à préparer l'analyse d'impact relative à l'initiative sur le « droit à la réparation » visant à promouvoir la réparation des biens de consommation. Elle a mis l'accent sur l'analyse de la problématique et l'évaluation des effets des mesures politiques proposées pour y remédier.

Méthodologie de l'étude

Les lignes directrices pour une meilleure réglementation et la boîte à outils connexe pour l'approche globale de l'analyse d'impact ont été appliquées dans le cadre de cette étude.

Les données primaires provenaient notamment des sources suivantes :

- une enquête en ligne comprenant une expérience comportementale intégrée menée auprès d'un échantillon de 10 144 consommateurs dans 10 États membres ;
- une deuxième expérience comportementale en ligne menée auprès de 8 032 personnes dans 10 États membres ;
- une enquête auprès de fabricants, de vendeurs (commerces de détail) et de réparateurs de produits inclus dans la collecte de données, à laquelle

88 entreprises ont pleinement collaboré et 72 entreprises ont fourni des réponses partielles. Au total, 160 entreprises ont donc répondu aux questions, dont une partie au moins a été utilisée pour l'étude ;

- 600 enquêtes « client mystère », dans lesquelles les clients mystères jouaient le rôle d'un consommateur en possession d'un produit défectueux afin de déterminer si le vendeur proposait une réparation ou un remplacement et comment ce choix était expliqué ;
- 21 entretiens ont en outre été menés avec des spécialistes et des parties prenantes.

Ces données ont complété la collecte de données secondaires (recherche documentaire et analyse de la littérature) réalisée au cours de la première phase de l'étude.

Les effets que pourraient produire les mesures politiques et leur regroupement en options ont été évalués à l'aide d'un modèle environnemental et d'un modèle économique, qui associaient des données primaires et des données issues de la recherche documentaire et de l'analyse de la littérature. Ces modèles avaient pour objectif de déterminer les effets du statu quo et des mesures proposées sur différents indicateurs économiques et environnementaux (cf. ci-après).

Les collectes de données primaires et secondaires se sont concentrées sur un échantillon de catégories de biens de consommation populaires sélectionnées sur la base de critères spécifiques. Ces catégories étaient les téléphones portables/smartphones, les télévisions, les réfrigérateurs, les ordinateurs portables, l'habillement, les chaussures, les voitures et les meubles en bois. Enfin, l'étude a formulé des conclusions horizontales applicables à la plupart des biens de consommation disponibles sur le marché. Au besoin, une analyse spécifique à des produits particuliers figure dans l'étude principale.

Identification du problème et de ses causes principales

Le problème de fond étudié réside dans l'élimination prématurée de biens viables et réparables. Il est apparu que des défauts surviennent relativement tôt dans le cycle de vie des produits et que dans l'état actuel des choses, une majorité des consommateurs préfèrent un remplacement à une réparation. Un quart des consommateurs interrogés dans l'étude ont déclaré qu'un défaut était déjà survenu au cours des deux premières années de vie d'un produit dans les catégories de biens dont il était question. Près de deux tiers (65 %) des consommateurs choisiraient toujours ou probablement de remplacer un produit, contre 31 % seulement qui choisiraient probablement ou toujours de le faire réparer, malgré de profondes différences entre les catégories de biens. La réparation est beaucoup plus courante dans certaines catégories de produits (par exemple les voitures) que dans d'autres (par exemple les chaussures ou les téléphones portables).

Le phénomène d'obsolescence observé comporte de multiples facettes. Cette étude ne portait pas sur l'obsolescence programmée (réduction intentionnelle de la durée de vie des produits), mais sur l'obsolescence stylistique (mise au

rebut de produits viables parce qu'ils sont désuets) et l'obsolescence économique (cas dans lesquels l'achat d'un produit neuf est plus attrayant que la réparation sur le plan économique). Ces deux catégories ont été retenues parce qu'elles ont une influence sur les préférences que les consommateurs accordent aux options de réparation ou de remplacement.

Les deux principaux problèmes secondaires soumis à l'étude étaient les suivants :

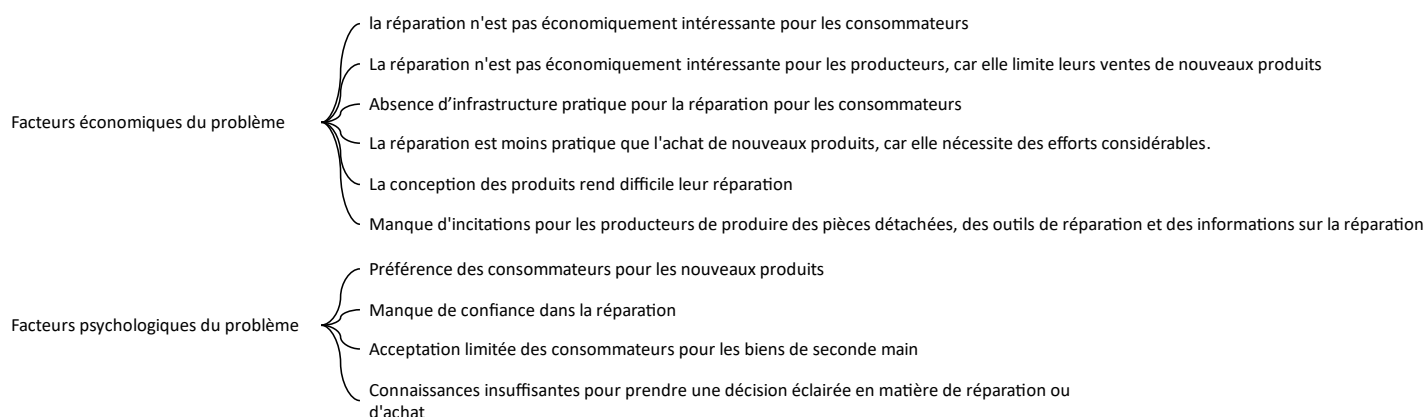
- Les biens ne sont pas utilisés aussi longtemps qu'ils pourraient l'être parce qu'ils ne sont pas réparés. D'après l'enquête, lorsque les consommateurs sont confrontés à un produit défectueux, un tiers seulement le font réparer et 12 % le réparent eux-mêmes, tandis que près d'un tiers le remplacent.
- Les consommateurs utilisent peu de biens d'occasion. Il n'existe pas suffisamment d'incitations à l'achat de biens d'occasion et l'offre de biens d'occasion semble limitée. Plus de la moitié des consommateurs interrogés préfèrent systématiquement acheter des produits neufs plutôt que des produits réparés ou remis à neuf qui, à leurs yeux, présentent des problèmes ou sont d'une qualité moindre.

Il ressort de l'étude que l'importance des phénomènes précités varie selon les catégories de produits. Les facteurs qui influencent l'achat de produits neufs ou la réparation de produits dépendent largement des catégories de produits (p. ex. chaussures ou lave-linge).

Ainsi que montre le schéma ci-après, les causes principales à l'origine du problème de l'élimination prématurée de biens sont, d'une part, économiques et, d'autre part, psychologiques. Les plus marquantes sont les suivantes :

- Plus d'un tiers des personnes interrogées qui n'ont pas réparé un produit défectueux justifient ce choix par le coût élevé de la réparation ;
- Une personne interrogée sur cinq déclare que la raison pour laquelle elle n'a pas réparé un produit défectueux est qu'elle préfère un produit neuf ;
- D'après les spécialistes interrogés, la faible réparabilité des produits du fait de leur conception constitue une cause majeure, qui est d'ailleurs également citée par un consommateur sur dix pour expliquer la non-réparation d'un produit ;
- La cause de non-réparation liée aux efforts nécessaires à une réparation, notamment pour chercher un réparateur et obtenir un devis, varie selon les catégories de produits, affectant fréquemment les meubles en bois et l'habillement, mais beaucoup moins les smartphones ;
- Enfin, l'absence d'infrastructures pratiques pour une réparation est citée par plus d'un consommateur sur dix pour expliquer la non-réparation d'un produit.

Figure 2 - Causes du problème



Le taux de réparation (par opposition au remplacement ou à être jeté) des produits défectueux par les producteurs lorsqu'un produit leur est retourné est plutôt faible. Ce faible taux peut être expliqué par exemple par des coûts logistiques et de réparation élevés.

L'étude a conclu que l'élimination prématurée des biens réduit la durée de vie de la consommation et entraîne d'importantes répercussions économiques et environnementales préjudiciables. Cette élimination prématurée donne lieu à une utilisation déficiente des ressources nécessaires à la fabrication de biens (c.-à-d. à un gaspillage de ressources) et à une production d'émissions de CO₂ et de déchets. Il a ainsi été estimé que 3,6 millions de tonnes de ressources sont gaspillées à cause de l'élimination prématurée de biens, générant 30 millions de tonnes d'équivalent CO₂. Cela correspond à 4,8 millions de tonnes de déchets, soit les déchets produits par quelque 14,5 millions d'Européens (3,2 % de la population de l'UE). Autrement dit, l'élimination prématurée contribue considérablement à la production de déchets et à l'empreinte carbone.

La déficience du marché analysée dans l'étude implique que l'élimination prématurée de biens nuit au bien-être des consommateurs (elle induit un préjudice pour les consommateurs). Cette détérioration est imputable au coût combiné des produits que les consommateurs sont contraints de racheter neufs parce qu'ils ne peuvent pas réparer leurs produits défectueux. Le préjudice effectif pour les consommateurs est estimé à 5,1 milliards d'euros par an. De plus, ce chiffre est sans doute sous-évalué, car il reflète uniquement la perte de bien-être pour les personnes qui souhaitaient réparer un produit, mais n'ont pas pu le faire.

Loin d'être statiques, les causes du problème décrites ci-dessus sont en constante évolution. La situation fluctue toutefois sensiblement d'une catégorie de produits à l'autre sur le marché et parmi les consommateurs. D'après l'étude, aucune des tendances identifiées n'a le potentiel de réduire l'élimination prématurée des biens dans une mesure telle que le problème serait résolu. Dans la plupart des catégories de produits étudiées, le comportement des consommateurs à l'égard de la réparation ou du remplacement des produits ne devrait selon toute vraisemblance connaître aucun changement si le marché des services de réparation reste dans son état actuel.

Dans le domaine de l'électronique, l'importance croissante du marché de l'occasion donne à penser qu'une plus grande part de ces produits sera remise à neuf à l'avenir, ce qui alimentera une progression du marché des produits électroniques d'occasion et remis à neuf. Le problème de l'élimination prématurée des dispositifs électriques et électroniques pourrait ainsi être contré, quoique dans une mesure inconnue.

Analyse du marché des services de réparation

Il a été constaté qu'il existe des structures de réparation et de réemploi pour les huit catégories de produits retenues aux fins de l'étude. De nombreuses opérations de réparation demeurent cependant extrêmement coûteuses (p. ex. remplacement de l'écran d'un téléphone portable).

Lorsqu'un produit comporte un défaut présent depuis la livraison à l'intérieur de la période de garantie légale, une réclamation peut être adressée au vendeur. En pratique, toutefois, la garantie légale se confond souvent avec la garantie commerciale offerte par le fabricant. Le vendeur confie alors la réparation au fabricant ou à un réseau de réparateurs sous-traitants. À l'heure actuelle, les fabricants exécutent rarement les réparations en interne, mais ils finissent généralement par supporter leur coût (au titre de la garantie commerciale ou de la garantie légale en vertu d'accords interentreprises avec les vendeurs) et ils fournissent les pièces de rechange. Eu égard aux coûts élevés de la logistique et des réparations, tant les fabricants que les vendeurs privilégient couramment le remplacement plutôt que la réparation.

Lorsqu'un défaut survient en dehors du champ d'application de la garantie légale, les coûts de réparation sont à la charge du consommateur. Si le fabricant assure une réparation au-delà de la garantie, il peut recourir aux mêmes infrastructures que pour les réparations couvertes par la garantie. Sans garantie, les consommateurs peuvent réparer leurs produits eux-mêmes ou s'adresser à un *repair café* ou un réparateur indépendant ou agréé. Les ateliers de réparation locaux semblent être l'option favorite des consommateurs (ils recueillent la préférence de 25 à 53 % des consommateurs selon le produit).

Pour certains produits (p. ex. chaussures ou réfrigérateurs), les réparations se sont raréfiées ces dernières années, alors qu'elles ont augmenté pour l'électronique. Même si le marché de la réparation est apparemment resté relativement stable au cours des dix dernières années, un déclin a pu être noté avant 2014, et un léger redressement après 2014.

De nombreux obstacles empêchent toujours l'essor rapide d'un marché de la réparation. Selon les parties prenantes, l'un des obstacles les plus flagrants tient au manque de pièces de rechange.

Nécessité d'une action de l'UE

Le problème étudié, ses causes et ses conséquences démontrent l'existence d'une carence du marché quant à la réparation des produits. Ce dysfonctionnement requiert une intervention réglementaire. L'une des causes mises en évidence tient à l'absence

d'un cadre réglementaire approprié pour que les consommateurs puissent faire réparer leurs produits défectueux à un prix raisonnable, surtout en dehors de la garantie légale. Une proposition de directive européenne visant à donner aux consommateurs les moyens d'agir en faveur de la transition écologique³, adoptée en mars 2022, s'est récemment attaquée au manque d'information des consommateurs sur la réparabilité et la durabilité des produits qu'ils achètent. Cette initiative entend faire en sorte que les consommateurs obtiennent des informations fiables et utiles sur les produits (par exemple en ce qui concerne leur durée de vie et les possibilités de réparation), lutter contre l'écoblanchiment et fixer des exigences minimales pour les logos et les labels de durabilité.

Ensemble, les mesures politiques déjà en place pourraient contribuer à prolonger la durée de vie des biens de consommation tout au long de leur cycle de vie. La plupart de ces mesures s'appliquent toutefois au stade de la conception ou de la fabrication (p. ex. Initiative sur les produits durables) ou au stade précontractuel, lorsque les consommateurs décident d'acheter un produit (Donner aux consommateurs les moyens d'agir en faveur de la transition écologique). Après la vente, les consommateurs sont protégés par la garantie légale en cas de défaut d'un produit et peuvent demander la réparation ou le remplacement de leur produit par le vendeur ou invoquer l'éventuelle garantie commerciale du fabricant. Les consommateurs peuvent également remédier au défaut à leurs frais si la garantie légale (ou, le cas échéant, commerciale) n'est pas applicable. Aucune des mesures actuelles, au stade de la fabrication, au stade précontractuel ou après la vente, n'encourage donc directement les consommateurs à réparer leurs produits en cas de défaut.

L'étude a identifié, dans le parcours de consommation, quelques moments clés potentiels auxquels les consommateurs pourraient être convaincus de réparer leurs produits défectueux, ainsi que les facteurs susceptibles d'influencer cette décision. Ces possibilités étant bien comprises, une série de mesures ont été élaborées pour permettre d'accroître la réparation ou l'utilisation de biens d'occasion à la fois à l'intérieur et à l'extérieur de la garantie légale.

La résolution du problème exige une action légale et/ou extralégale. L'étude montre que les consommateurs, les fabricants et les vendeurs ne modifieront pas leur comportement si le cadre réglementaire n'instaure pas certaines conditions.

Scénario de référence

La situation de référence est une base de comparaison indispensable pour évaluer l'efficacité attendue des mesures proposées. Dans cette étude, la référence dynamique est fondée sur une période de 15 ans et sur les taux de réparation actuels résultant de l'enquête auprès des consommateurs, tant dans le cadre de la garantie légale qu'en dehors. Elle prend en considération les améliorations que les initiatives européennes déjà adoptées devraient apporter au cours des 15 prochaines années.

³ Disponible sur : https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12467-Politique-des-consommateurs-renforcer-le-role-des-consommateurs-dans-la-transition-ecologique_fr

En complément, la référence dynamique intègre l'évolution escomptée du marché dans les catégories de produits sélectionnées durant cette même période. Elle anticipe la quantité de biens de consommation qui seront réparés avec fruit à l'avenir dans l'UE sur la base de données historiques. Cet indicateur est essentiel, car le nombre de produits réparés (un critère primordial pour estimer les effets économiques et environnementaux) est directement lié au nombre de produits vendus.

Les produits qui ne doivent pas être achetés (et, par conséquent, fabriqués à neuf) en raison de réparations ont servi de base pour calculer les gains environnementaux des réparations. Ces gains environnementaux correspondent à la quantité de CO₂ et de déchets qui auraient été engendrés et à la quantité de ressources qui auraient été consommées pour la fabrication des produits de remplacement neufs et l'élimination des anciens.

Le nombre de produits réparés n'est pas nécessairement égal au nombre de produits qui ne doivent pas être achetés neufs. Le nombre de réparations a donc été corrigé de deux facteurs :

- Le premier facteur traduit le ratio entre la durée de vie absolue d'un produit et l'allongement moyen de sa durée de vie à la suite d'une réparation. Un exemple illustre l'importance de ce ratio pour les gains environnementaux : admettons qu'un produit a une durée de vie absolue de trois ans. Sa réparation prolonge sa durée de vie d'un an, mais après cette période, un produit neuf est acheté. Le gain environnemental n'équivaut donc pas à un produit complet, mais à un tiers de ce produit (1/3).
- Le deuxième facteur de réduction a trait au taux de défauts qui surviennent à nouveau immédiatement après la réparation. Il est considéré qu'un produit qui présente à nouveau un défaut juste après une réparation ne permet pas d'engranger un bénéfice et ne constitue donc pas un produit qui ne doit pas être acheté à neuf en raison d'une réparation.

Aux fins de la référence dynamique, une évaluation a d'abord été réalisée sur la base des produits examinés en détail dans l'étude, puis les estimations ont été extrapolées à l'ensemble de l'économie.

Dans le scénario de référence, les réparations éviteront la mise sur le marché de l'équivalent de 1 584 millions de produits. Cela représente une économie de 47 millions de tonnes d'équivalent CO₂, de 5 millions de tonnes de ressources et de 8,7 millions de tonnes de déchets grâce aux réparations permettant de réduire l'élimination prématurée de produits. Ces chiffres sont extrapolés à l'ensemble de l'économie et des biens de consommation durables réparables pertinents.

En tenant compte de la croissance escomptée du marché, la valeur de production totale s'élèvera à 10,7 billions d'euros, aux prix à la production, pour les biens de consommation durables (réparables) pertinents vendus dans l'UE entre 2023 et 2037. Cette valeur a été extrapolée pour inclure tous les biens de consommation durables réparables. Sur ce total, les biens fabriqués dans l'UE atteindront une valeur d'environ 4,1 billions d'euros, ce qui correspond à un volume de vente au détail dépassant 16 billions d'euros (aux prix à la consommation).

Le modèle économique calcule ensuite la valeur économique de la production (y compris les biens fabriqués dans l'UE), les produits remplacés et réparés dans le scénario de référence et leur valeur. Les résultats sont utilisés dans la suite de l'analyse d'impact pour chiffrer les économies pour les consommateurs et les gains économiques.

Ces données ont servi de référence pour déterminer quelles économies supplémentaires pourraient être réalisées si de nouvelles mesures politiques favorisaient la réparation et la remise à neuf.

Mesures en faveur d'une plus longue durée de vie utile des produits

Dans le droit fil des lignes directrices pour une meilleure réglementation, l'étude a imaginé et examiné une série de mesures politiques granulaires, qui ont chacune été comparées au scénario de référence.

Le tableau ci-après énumère les mesures examinées en profondeur dans l'étude. Les mesures rejetées à un stade précoce sont ignorées dans cette synthèse, mais le rapport complet les passe en revue.

Tableau 3 - Liste des mesures politiques envisagées

Description de la mesure		Hypothèse relative aux résultats attendus	Destinataires	Dans le cadre / En dehors de la garantie légale
M1 La réparation comme principal recours	Le système de recours de la directive relative aux ventes de biens permet aux consommateurs de choisir entre la réparation et le remplacement si le produit qu'ils ont acheté s'avère défectueux au cours de la période de responsabilité (d'au moins deux ans). Au titre de cette mesure, les consommateurs ne pourraient demander le remplacement du produit au cours de la période de garantie légale que si la réparation n'est pas possible ou si elle impose un coût disproportionné au vendeur.	Limiter le remplacement des produits lorsqu'une réparation est possible et n'imposerait pas un coût disproportionné au vendeur.	Vendeurs	Dans le cadre de la garantie légale
M2 Préférence pour la réparation dans le test de proportionnalité	Cette mesure obligerait le recours à la réparation au lieu du remplacement dans tous les cas où la réparation est moins chère que le remplacement ou son coût est équivalent. Les consommateurs ne pourraient demander le remplacement que si la réparation est plus coûteuse que le remplacement.	Limiter le remplacement des produits lorsqu'une réparation est possible et n'imposerait pas un coût disproportionné au vendeur.	Vendeurs	Dans le cadre de la garantie légale
M3 Interruption / suspension de la période de garantie légale	Au cours de la période de garantie légale, les consommateurs peuvent décider s'ils souhaitent que leur produit défectueux soit remplacé ou réparé, mais ils pourraient être incités à opter pour la réparation si la période de garantie légale était interrompue ou suspendue. En cas d'interruption, la période de garantie légale recommencerait à zéro lorsque ce recours est invoqué. En cas de suspension, la période de responsabilité pourrait être prolongée de la durée de la réparation lorsque les consommateurs font réparer un produit défectueux au lieu de le remplacer.	Rendre la réparation plus attrayante pour les consommateurs en prolongeant la durée de la garantie légale s'ils choisissent la réparation.	Consommateurs	Dans le cadre de la garantie légale
M4 Allonger la période de garantie légale	La directive relative aux ventes de biens impose une période minimale obligatoire de deux ans durant laquelle la responsabilité du vendeur est engagée en cas de défaut de conformité existant au moment de la livraison.	Allonger la période durant laquelle les consommateurs	Vendeurs	Dans le cadre de la garantie légale

Description de la mesure		Hypothèse relative aux résultats attendus	Destinataires	Dans le cadre / En dehors de la garantie légale
	Cette mesure allongerait la période de garantie légale au-delà de la durée minimale actuelle de deux ans pour les produits neufs.	peuvent choisir entre les recours à la réparation ou au remplacement.		
M7 <i>Aligner la période de responsabilité pour les biens remis à neuf sur celle applicable aux biens neufs</i>	Actuellement, la directive relative aux ventes de biens permet aux États membres d'autoriser les consommateurs et les vendeurs à convenir d'un délai de responsabilité plus court (mais pas inférieur à un an) pour les biens d'occasion. Cette exception pourrait être maintenue partiellement pour les biens d'occasion. En revanche, les États membres ne pourraient pas autoriser les consommateurs et les vendeurs à convenir d'un délai de responsabilité plus court pour les biens remis à neuf.	Accroître le recours aux biens remis à neuf parmi les consommateurs	Vendeurs de biens remis à neuf	Dans le cadre de la garantie légale
M8a <i>Remplacement par des biens remis à neuf au cours de la période de responsabilité prolongée</i>	Cette mesure pourrait être adoptée en combinaison avec la prolongation de la période de responsabilité dans le cadre de la réparation (M3). Le remplacement par des biens remis à neuf constituerait un recours alternatif à la réparation lorsque la réparation n'est pas possible ou engendrerait des coûts excessifs. Cette mesure ne s'appliquerait qu'au cours de la période de responsabilité supplémentaire dépassant la période de responsabilité minimale de deux ans (ou davantage selon le régime mis en place par chaque État membre). Elle ne s'appliquerait pas au cours des deux premières années de responsabilité, car durant cette période, les consommateurs peuvent considérer que seul le remplacement par un bien neuf est un remplacement adéquat. Après deux ans, le remplacement par un bien remis à neuf, dans la mesure du possible, pourrait se justifier en ce que le bien défectueux a déjà été utilisé pendant une durée non négligeable.	Réduire le taux de remplacement par des biens neufs et accroître le recours aux biens remis à neuf	Vendeurs	Dans le cadre de la garantie légale
M8b <i>Remplacement par des biens remis à neuf à partir de la deuxième année de la période de responsabilité</i>	Afin d'encourager davantage encore l'utilisation de biens remis à neuf, cette mesure permettrait aux vendeurs de proposer des biens remis à neuf à titre de biens de remplacement dès la deuxième année de la période de responsabilité. Après une année, de nombreux produits sont susceptibles de présenter des signes d'usure. Il pourrait donc être jugé opportun d'accorder aux vendeurs la possibilité supplémentaire de remplacer un produit défectueux par un produit remis à neuf, dans la mesure du possible.	Réduire le taux de remplacement par des biens neufs et accroître le recours aux biens remis à neuf	Vendeurs	Dans le cadre de la garantie légale

Description de la mesure		Hypothèse relative aux résultats attendus	Destinataires	Dans le cadre / En dehors de la garantie légale
M9a Droit à la réparation (uniquement écoconception)	Cette mesure créerait un droit à la réparation pour les consommateurs pour les produits respectant les exigences en matière d'écoconception. Au titre d'un tel droit, les consommateurs pourraient demander aux fabricants que les produits défectueux soient réparés pour un prix raisonnable pendant une période déterminée après la période de garantie légale. À la différence des mesures précitées, ce droit s'appliquerait aux cas dans lesquels la directive relative aux ventes de biens ne prévoit pas la réparation. Autrement dit, il couvrirait les défauts qui surviennent après l'expiration de la période de garantie légale, mais aussi ceux qui surviennent pendant la période de garantie légale, mais n'entrent pas dans le champ d'application de la directive relative aux ventes de biens. Cette mesure s'appliquerait aux produits réparables issus de l'écoconception ⁴ et, par la suite, du REPD).	Accroître la réparation des biens de consommation en dehors de la garantie légale, mais aussi en cas de défauts survenant pendant la garantie légale, mais non couverts par la directive relative aux ventes de biens	Producteurs de produits écoconçus (fabricants, importateurs)	En dehors de la garantie légale
M9b Droit à la réparation (tous les produits)	La mesure M9a serait étendue à tous les produits.	Accroître la réparation des biens de consommation en dehors de la garantie légale, mais aussi en cas de défauts survenant pendant la garantie légale, mais non couverts par la directive relative aux ventes de biens	Producteurs de produits quels qu'ils soient (fabricants, importateurs)	En dehors de la garantie légale

⁴ L'obligation de réparation pourrait s'appliquer aux produits pour lesquels des exigences de réparabilité dans la réglementation régissant l'écoconception existent déjà ou seront adoptées ultérieurement.

Description de la mesure		Hypothèse relative aux résultats attendus	Destinataires	Dans le cadre / En dehors de la garantie légale
M11 Émission d'un devis pour la réparation	Les acteurs proposant des services de réparation (p. ex. producteurs, vendeurs ou réparateurs) seraient tenus, à la demande des consommateurs, d'émettre un devis pour la réparation. Ce devis devrait être émis sous une forme normalisée et contenir des informations spécifiques, comme la durée, tout engagement quant à la qualité et le coût de la réparation.	Accroître la réparation des biens de consommation en dehors de la garantie légale en informant mieux les consommateurs sur les conditions de la réparation (p. ex. acteurs proposant un service de réparation et coût).	Services de réparation et fabricants/vendeurs proposant un service de réparation	En dehors de la garantie légale
M12 Obligation d'information sur les services de réparation	Dans le sillage d'une disposition existant dans la législation sectorielle de l'UE, cette option prévoit d'imposer aux producteurs l'obligation horizontale d'indiquer où trouver des services de réparation professionnels. Il s'agit ainsi de faciliter l'accès des consommateurs aux informations et la recherche d'un réparateur approprié pour un produit donné. Ces informations peuvent être communiquées à moindres frais en publiant les références de sites Internet, les adresses et les coordonnées de réparateurs sur un site Internet accessible gratuitement, qui doit être actualisé régulièrement. Cette obligation peut s'appliquer aux fabricants, comme le prévoient les règles sectorielles sur l'écoconception déjà adoptées dans l'UE.	Sensibiliser davantage les consommateurs à la possibilité de réparer leurs biens	Producteurs de produits quels qu'ils soient (fabricants, importateurs)	En dehors de la garantie légale
M13a Plateforme d'informations sur les services de réparation disponibles (niveau national)	Cette option implique la création d'une plateforme en ligne, comprenant un moteur de recherche, qui mettrait les consommateurs en relation avec les réparateurs pour les principaux produits de consommation au niveau national. L'objectif consiste à faciliter la recherche de services de réparation appropriés et à améliorer la transparence sur les conditions de réparation afin d'inciter les consommateurs à opter pour la réparation. Il s'agirait d'un outil de comparaison indépendant, qui aiderait les utilisateurs finaux à évaluer les avantages des différents services de réparation sur la base	Accroître la réparation des biens de consommation en dehors de la garantie légale en informant mieux les consommateurs sur les acteurs	Services de réparation	En dehors de la garantie légale

Description de la mesure		Hypothèse relative aux résultats attendus	Destinataires	Dans le cadre / En dehors de la garantie légale
	d'informations normalisées, facilitant la comparaison des prix et des indicateurs de qualité.	proposant un service de réparation et le coût.		
M13b Plateforme d'informations sur les services de réparation disponibles (niveau européen)	Cette option implique la création d'une seule plateforme en ligne au niveau de l'UE, comprenant un moteur de recherche, qui mettrait les consommateurs en relation avec les réparateurs pour les principaux produits de consommation. Comme pour la mesure M13a, l'objectif consiste à faciliter la recherche de services de réparation appropriés et à améliorer la transparence sur les conditions de réparation afin d'inciter les consommateurs à opter pour la réparation. La mise en œuvre la plus efficace de cette mesure consisterait à ajouter de nouvelles fonctions au portail EPREL pour les produits portant un label énergétique.	Accroître la réparation des biens de consommation en dehors de la garantie légale en informant mieux les consommateurs sur les acteurs proposant un service de réparation et le coût.	Services de réparation	En dehors de la garantie légale
M14 Engagements volontaires envers une « norme européenne commune de réparation facile »	Cette option implique l'engagement volontaire à respecter une norme européenne de qualité dans les services de réparation. L'élaboration d'une norme au niveau européen viserait d'une part, à stimuler la confiance des consommateurs dans les services de réparation à travers l'UE et, d'autre part, à éviter les obstacles à l'accès au marché pour les entreprises.	Stimuler la confiance des consommateurs dans les services de réparation et éviter les obstacles à l'accès au marché pour les entreprises	Services de réparation et fabricants/vendeurs proposant un service de réparation	En dehors de la garantie légale

Évaluation des impacts

Toutes les mesures ont été évaluées et comparées à la lumière des mêmes critères, à savoir leur impact probable sur les indicateurs énumérés dans le tableau ci-après. Cette évaluation s'est fondée sur deux modèles principaux : un modèle axé sur les conséquences environnementales et un modèle axé sur les conséquences économiques, lequel intègre également les données du modèle environnemental.

Tableau 4 - Liste des impacts évalués

	Type d'évaluation
Confiance et protection des consommateurs	Qualitative
Prise de décision des consommateurs (propension à la réparation)	Quantitative
Économies pour les consommateurs	Quantitative
Croissance et investissements	Quantitative
Économies dans les coûts de production pour les fabricants	Quantitative
Coûts d'adaptation pour les entreprises	Quantitative
Coûts administratifs pour les entreprises	Quantitative
Changements dans l'emploi	Quantitative
Impacts sur l'administration publique (coûts de mise en œuvre)	Quantitative
Contribution à la lutte contre le changement climatique	Quantitative
Promotion de l'utilisation efficiente des ressources (renouvelables et non renouvelables)	
Production de déchets et recyclage	
Cohérence avec les autres dispositions législatives de l'UE	Qualitative

Le chapitre 5.3 expose les effets escomptés de chacune de ces mesures sur ces indicateurs dans le cadre et en dehors de la garantie légale. Les effets d'une combinaison des mesures suivantes ont également été étudiés :

- M2 - Préférence pour la réparation dans le test de proportionnalité
- M9a - Droit à la réparation (uniquement écoconception)
- M11 - Émission d'un devis pour la réparation
- M12 - Obligation d'information sur les services de réparation
- M13 - Plateforme d'informations sur les services de réparation disponibles
- M14 - Engagements volontaires envers une « norme européenne commune de réparation facile »

Les effets combinés les plus significatifs de ces mesures devraient être les suivants :

- La situation financière nette des consommateurs s'améliorerait de 176,5 milliards d'euros sur 15 ans (économies pour les consommateurs grâce aux nouveaux achats évités).
- Les producteurs européens bénéficieraient d'une diminution nette de leurs coûts de 15,6 milliards d'euros en évitant la fabrication de produits qui étaient auparavant remplacés et qui seront à l'avenir réparés.

- En raison du glissement en direction de la réparation des produits, moins de produits neufs seraient vendus. La perte de recettes sur les ventes de produits neufs est estimée à environ 4,3 milliards d'euros pour les fabricants européens, soit une perte de VAB de 1,0 milliard d'euros.
- L'évolution du chiffre d'affaires (due à la disparition de ventes) dans le secteur européen de la distribution (importateurs, grossistes et détaillants de produits neufs et remis à neuf inclus) représenterait un montant estimé à 40,4 milliards d'euros sur 15 ans. En appliquant les chiffres d'Eurostat à la structure économique de ce secteur, on peut calculer une perte de VAB de 10,9 milliards d'euros parmi les vendeurs.
- Les recettes du secteur de la réparation gagneraient 44 milliards d'euros, ce qui correspond à la production d'une VAB supplémentaire de 16,7 milliards d'euros dans ce secteur.
- Les coûts ponctuels totaux d'adaptation des entreprises sont estimés à 731 millions d'euros. Des coûts récurrents d'environ 8,0 milliards d'euros sur la période de 15 ans étudiée sont également escomptés, dont une grande partie est liée aux coûts constants d'émission de devis résultant de la mesure M11.

Les émissions devraient être réduites de 18,5 millions de tonnes d'équivalent CO₂ sur 15 ans.

1. Introduction

1.1. Objectives of the study

This study supports DG JUST in its impact assessment for measures that aim to increase the useful life of goods by incentivising the take up of repairs instead of replacements of goods. The study focuses on the lifecycle of consumer goods with the objective of extending their useful life and thus their sustainability in an after-sales context. It contributes to designing the European Union (EU) actions to foster repairability and repair take up by focusing on measures that target consumers, sellers, manufacturers, and repair services. It is part of the initiative on the right to repair (in the European Green Deal) announced as part of the 2021 State of the Union speech⁵.

The Commission's objectives related to sustainable consumption aim to incentivise both consumers and the industry itself to repair goods rather than replace them, and to encourage manufacturers to incorporate sustainability concerns into their production. The latter is in the remit of the Ecodesign for Sustainable Products Regulation (ESPR)⁶, which provides supply-side requirements for product repairability, while the Sustainable consumption of goods and Empowering Consumers in the Green transition (ECGT) initiatives provide all demand-side requirements⁷.

The initiative is aligned with the objective of the European Green Deal to encourage 'longer lasting products that can be repaired, recycled and re-used'. This objective was further stressed by the Circular Economy Action Plan (CEAP), which set out action points to disentangle growth and consumption of new products and resources. The pandemic and the subsequent recovery plan focusing on a fairer and greener future is focused on the very same objective. There is thus important political traction for a clearer framework on reparability of consumer goods.

In this context, the purpose of this study is to contribute to the Commission's work focused on fostering consumers' role in sustainable consumption by ensuring that

⁵ Available at: https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

⁶ Proposal for REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for setting eco-design requirements for sustainable products and repealing Directive 2009/125/EC: https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/sustainable-products/ecodesign-sustainable-products_en

⁷ Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for a green transition through better protection against unfair practices and better information: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52022PC0143&qid=1649327162410>

goods are used for as long as possible. To analyse the underpinning problem the study aims to ascertain whether consumers dispose of consumer goods prematurely and, if so, what are the causes and consequences of this potential problem. If it is established that the problem exists, the team will analyse and compare a number of measures that could potentially address this issue.

This study provides an in-depth analysis of the potential problem of premature disposal of consumer goods. The study subsequently assesses the size of this problem, its drivers, and any future evolution. It also estimates and compares the impacts (in terms of effectiveness, coherence, and efficiency) of the possible solutions. The ultimate objective of the solutions proposed would be, if the problem is confirmed, to extend the use of consumer goods throughout their useful life and promote repair.

An assessment from the business side is carried out through the analysis of the existing and future market practices that affect the duration of the useful life of consumer goods and from a consumer perspective, using behavioural research tools.

This report concerns only Part A of the JUST/2021/PR/CLAW/CIVI/0031 contract in line with an agreed work programme for this assignment.

1.2. Geographical scope

The study covers 12 EU Member States (MS), which were selected based on the methodology summarised in this section. The MS are Estonia, Germany, France, Netherlands, Spain, Italy, Greece, Bulgaria, Czechia, Poland, Romania, and Sweden.

The product selection was used primarily for the data collection activities carried out in the study. The business survey and mystery shopping exercise cover all these MS, while the consumer survey and behavioural experiment covers only ten of these MS. A detailed explanation on data collection activities, sampling, and geographical coverage can be found in Chapter 2.2.

By looking at the overall sustainability of products across the production and consumption chains, the present study looks both at the demand side (consumer behaviours) and the supply side (industry of consumer goods production) for repair. Therefore, in terms of the country selection we took the same approach. We tried to capture the diversity of the markets by looking at both the current demand for repair, the consumption of goods, and the size of the repair sector (by looking at the proportion of workers in the business economy that work in the repair sector).⁸

⁸ Additionally, in order to have a country selection that is also relevant for task B, we have approximated the willingness to allow use of data for service provision through Eurobarometer data on willingness to have one's online activities monitored for unrestricted access to a certain service. However, the final country selection for task B may be carried out separately at the inception phase based on more granular data.

The criteria used have been selected to capture the diversity of situations across the EU, which shall ensure representativeness of results and extrapolation for the whole of the EU:

- **Geographical coverage.** In order to offer sufficient coverage of the different geographical regions of the EU, we have opted for a selection of 12 MS representing the various sub-regions of the EU (as per Eurovoc's classification⁹). We thus have two Nordics (one Scandinavian, Sweden; and one Baltic, Estonia), three western (Germany, France, and the Netherlands), three southern (Spain, Italy, and Greece) and four central and eastern EU MS (Bulgaria, Czechia, Poland, and Romania).
- **Size of the country's population**¹⁰. The selection of MS proposed covers 82% of the population of the EU. This means that the findings of this study comprise markets covering four out of five Europeans. The country selection covers all country sizes, including the MS with the highest population in the EU (> 35 million inhabitants), medium-sized MS (6-20 million inhabitants) and MS with a small population (< 6 million inhabitants).
- **Proportion of the population who repaired a product instead of buying a new one in 2019** (source: Eurobarometer 2019¹¹). This indicator captures the differences in consumer habits when it comes to how people consume and how often they repair their products across the EU. The results of the Eurobarometer have shown tremendous differences between Poland, where only 20% of the population declared having repaired a product they owned, compared with 52% in Sweden (both MS are included in the sample). Our country selection thus covers some of the biggest players in repair habits within the EU (Sweden, France, Estonia, the Netherlands, and Germany), MS that stand around the EU average (Bulgaria and Greece, 27 and 28% respectively) and MS that are below the average such as Czechia, Spain, Italy, Poland and Romania, all reporting rates between 20 and 25% of their population having repaired a product.
- **Proportion of the business workforce employed in repairing computers and consumer goods** (Eurostat SBS, 2019¹²). This indicator serves as a proxy to estimate the differing magnitude of repair industries across the EU. Because repair is labour intensive, this indicator seems the best one available for all MS to reflect on the importance of the industry across markets in a standardised way. While there seems to be a slight correlation between this indicator and the wealth of a MS, other MS also show a high number of people employed in the repair sector. The reasons behind these numbers can be explained by higher consumer concerns regarding sustainability issues in some MS (e.g. France) or simply limited financial capabilities to buy new products (e.g. Romania).

⁹ Eurovoc (2021) https://eur-lex.europa.eu/browse/eurovoc.html?params=72,7206#arrow_911.

¹⁰ Eurostat (2020) <https://ec.europa.eu/eurostat/web/population-demography/demography-population-stock-balance/database>

¹¹ Eurobarometer for the European Commission (2020) Climate Action and the Environment. Fieldwork: December 2019. N=27.731 <https://europa.eu/eurobarometer/surveys/detail/2257>

¹² Eurostat (2019) https://ec.europa.eu/eurostat/databrowser/view/SBS_SC_SCA_R2_custom_905984/bookmark/able?lang=en&bookmarkId=2b85609f-993e-48a4-9930-b595f5ef96e2

- **Consumption of selected products as a proportion of the overall country households' consumption** (Eurostat, 2019¹³). Based on the selection of products relevant for this study, we looked at the proportion that they represent in all MS as a proportion of the overall nominal household consumption. The national consumption indicators include again the diversity of consumption habits across markets. They serve as a proxy to estimate the size of the markets and numbers of consumers in each country that would be affected by a change in the rules of production, sale, and repair. The difference across markets is more limited than across other indicators but hides important differences for example between Sweden and Greece with a 6pp gap (15% and 9% of overall household consumption in the countries is dedicated to items deemed relevant for this study).

In addition to statistical evidence, we were careful to select MS with specific measures aimed at increasing repair rates among citizens and that could prove interesting over the course of the study. For example, the inclusion of Sweden in the sample was further motivated by the preferential tax breaks Swedes can get for using repair services.¹⁴ Similarly, France proves to be an interesting MS to include in the sample due to the introduction in 2021 of reparability scoring in five initial product categories (laptops, lawnmowers, smartphones, washing machines and televisions).¹⁵

The tables below demonstrate how the sample of MS is representative in all categories:

Table 5 - Selected countries according to geographical diversity

Selected countries			
Category	Countries selected	Number of selected countries	Percentage of total
West	DE FR NL	3	43%
North	SE EE	2	33%
South	ES IT EL	3	50%
Central and Eastern	BG HU PL RO	4	50%
Total		12	44%

¹³ Eurostat (2019)

https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_CO3_P3_custom_1212545/default/table?lang=en; the categories selected were: clothing, furniture and furnishings, carpets and other floor coverings, householder textiles, household appliances, glassware, tableware and household utensils, tools and equipment for house and garden, goods and services for household maintenance, purchase of vehicles. While this selection is at times too broad/narrow compared to the list of relevant products for this study, it still represents a good estimate and is compensated by the consistency of the measurements across markets due to the same Eurostat methodology applied across countries.

¹⁴ <https://repair.eu/news/right-to-repair-is-blossoming-all-over-europe/>.

¹⁵ Ibid.

Table 6 - Country sample representativity against selection criteria

Selected countries			
Criterion	High	Medium	Low
Repaired a product instead of replacing it	5	2	5
Proportion of business workforce employed in repairs	5	3	4
Proportion of business workforce employed in repairing computers and consumer goods	10	7	10
Consumption of selected products	3	5	4

The table below recapitulates how each MS fares against our indicators distinguishing between the MS selected and the non-selected ones.

Table 7 - Country selection against all criteria used for sample selection

	Country	Geographical representation	Share of EU population		Consumption of selected products		Repaired a product instead replacing it		Proportion of the business workforce employed in repairs of computers and consumer goods (%)	
Selected countries	BG	Central and Eastern	2%	Medium	10%	Low	27%	Medium	2.86	Medium
	DE	West	19%	High	15%	High	35%	High	1.51	Low
	ES	South	11%	High	11%	Low	25%	Low	4.22	High
	EE	North	0%	Low	12%	Medium	36%	High	1.98	Low
	EL	South	2%	Medium	9%	Low	28%	Medium	3.88	High
	FR	West	15%	High	11%	Low	42%	High	4.08	High
	HU	Central and Eastern	2%	Medium	11%	Low	22%	Low	4.09	High
	IT	South	13%	High	14%	High	21%	Low	2.99	Medium
	NL	West	4%	Medium	13%	Medium	47%	High	2.40	Low
	PL	Central and Eastern	8%	High	13%	Medium	20%	Low	3.54	High
RO	Central and Eastern	4%	Medium	15%	High	22%	Low	2.63	Medium	
SE	North	2%	Medium	13%	Medium	52%	High	1.31	Low	
non selected countries	AT	West	2%	Medium	14%	High	30%	Medium	1.28	Low
	BE	West	3%	Medium	13%	Medium	32%	Medium	1.64	Low
	CZ	Central and Eastern	2%	Medium	12%	Medium	26%	Low	3.59	High
	CY	South	0%	Low	12%	Medium	27%	Medium	2.31	Low
	DK	North	1%	Low	13%	Medium	37%	High	2.50	Medium
	FI	North	1%	Low	11%	Low	45%	High	1.86	Low
	HR	Central and Eastern	1%	Low	10%	Low	31%	Medium	3.16	High
	IE	West	1%	Low	12%	Medium	29%	Medium	2.20	Medium
	LT	North	1%	Low	15%	High	30%	Medium	3.18	High
	LU	West	0%	Low	14%	High	37%	High	0.84	Very low
	LV	North	0%	Low	10%	Low	33%	Medium	3.13	High
	MT	South	0%	Low	12%	Medium	26%	Medium	3.65	High
	PT	South	2%	Medium	14%	High	18%	Low	2.44	Low
	SI	Central and Eastern	0%	Low	14%	High	32%	Medium	2.80	Medium
	SK	Central and Eastern	2%	Medium	11%	Low	32%	Medium	2.74	Medium

2. Methodological approach

In this section we present a summary of the approach to each of the three tasks within this work package, as well as a short description of the data collection tasks.

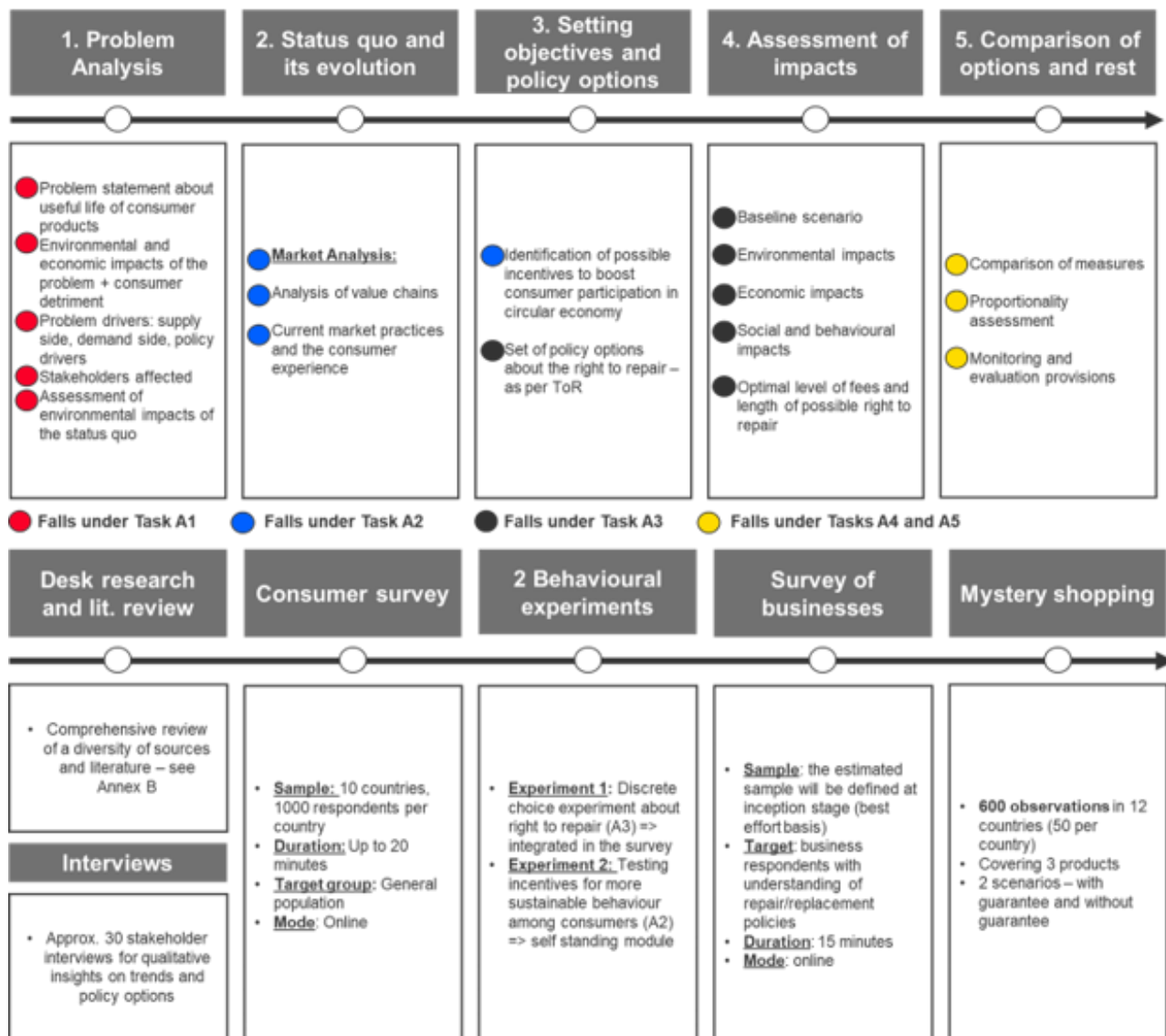
The study tasks follow the logic of the European Commission's Better Regulation Guidelines (BRG). They are therefore analytical tasks with a set of analytical steps.

There is not a 1-2-1 match between the analytical tasks and the sources of data and data collection methods. In fact, the different methods are transversal to the analytical tasks.

In the sections below we present a summary of the analytical tasks, followed by the data collection methods.

The figure below maps the analytical tasks and their sub-tasks presented in the Tender Specifications against the standard steps of an impact assessment. It also shows the data collection methods that we propose.

Figure 3 - Mapping of study tasks against the steps of an impact assessment + overview of study data collection methods



2.1. Product selection

Please note that a detailed description of the product selection process is included in Annex 1 attached to this report. This section provides a brief summary of the overall approach, including the final product selection. The product selection was also the basis of an extensive product-level literature review (available in Annex 2).

Since the various tasks within the study require collection and analysis of data at the product level, it was decided to focus on a wide selection of consumer products. In order not to overlook any relevant product types, a horizontal approach was chosen, i.e. different product types from all relevant product groups were considered for research. Focusing on a selection of consumer products ensured that the data collection and analysis could be carried out with the required level of specification and granularity. Therefore, in the first step, the most relevant and representative product categories in terms of frequency of purchase and potential to generate significant environmental impacts were identified by analysing relevant policy instruments related to the EU's circular economy objectives. These included:

- the EU's Circular Economy Action Plan (CEAP) (European Commission, 2020a);
- the EU's Sustainable Products Initiative (SPI) (European Commission, 2020b); and
- the ESPR and energy labelling working plan 2020—2024 (European Commission, 2021)¹⁶.

While many initiatives of the listed framework also cover B2B, the scope of the present assignment is B2C.

- As a first step, the policy instruments were analysed regarding the product categories and the associated product types covered. It was analysed which product categories the policy instruments have in common, i.e. it was assessed which of the categories are included in all three policy instruments and which categories occur in only one or two of the documents. Accordingly, a category was considered Class A if it was included in at least two of the policy instruments. Class B categories represent categories which have only been mentioned in one of the policy instruments.
- In the next step, the extent to which the individual categories contain product types that can be considered consumer goods was examined. Furthermore, the individual categories and associated product types were analysed in regard to their degree of reparability. While some of the categories as outlined in the three main analysed policy instruments revealed a large quantity of examples for product types (e.g. electronics and ICT), other categories provided a limited number of examples.
- Subsequently, a preliminary analysis on the most relevant product types per category was carried out focusing on further existing policy documents, scientific publications and publications of industrial organisations or NGOs (see list of documents in Annex 1). In consultation with the European Commission, a prioritisation was made to enable an effective and efficient collection and analysis of data on the product level.

¹⁶ In terms of the relationship between the SPI and the ESPR, the SPI remains the overarching policy framework, while the ESPR is proposed under this framework. In addition to the proposed regulation, other initiatives will be launched under the SPI framework – such as the provision of guidance on circular business models.

- As the last step, a more specific selection of product types per category was carried out in order to arrive at a final selection of the most exemplary products for analysis under subsequent tasks in the project. The criteria for the selection of the product types were the number of times the product types were mentioned in the respective documents and whether there direct information was available on the environmental impacts or benefits of repairing certain product types. Annex 1 contains more details and rationales about why a specific product type was selected.

Following the approach as outlined above, the following product types were selected for further assessment in subsequent tasks under this project:

- Mobile phones/smartphones;
- Televisions;
- Refrigerators;
- Laptops;
- Clothing;
- Shoes/footwear;
- Cars; and
- Wooden furniture.

Annex 2 of the study explains how the product selection was used in the study. At the beginning of the research, the problem definition and market analysis focused on the products from the selection. Given the numerous consumer goods types that could be subject to consumer repair and replacement, the study needed to be focused on a selection of consumer goods that were diverse enough to capture specificities of different product groups. Following the product-level assessment, the results were extrapolated and analysed in a horizontal manner.

As mentioned also above, all the primary data collection activities also focused on consumer goods from this selection.

2.2. Overview of data-collection methods

To inform the study's research questions, several data collection tools were deployed throughout the study duration. The figure below showcases the main data collection methods used throughout the study, the target groups, geographical scope, sample sizes and how the information stemming from these methods was used in the study.

Figure 4 - Overview of data collection methods deployed in this study

	TARGET GROUP	GEOGRAPHICAL COVERAGE	PRODUCT COVERAGE	SAMPLE SIZE	RESULTS FEEDING INTO ...
Literature review	-	EU-wide, non-EU	Phones, TVs, Fridges, Laptops, Clothing, Shoes, Cars, Wooden furniture	-	Problem definition Market analysis
Mystery shopping	Retailers	BG, EE, FR, DE, GR, HU, IT, NL, PL, RO, ES, SE	Phone, Shoes, Fridge	600 observations (50 per country)	Problem definition
Stakeholder interviews	NGOs, Business associations, consumer associations	NL, FI, UK, DE, SE, EU associations	Horizontal	21 qualitative interviews	- Problem definition - Measures analysis: M1, M2, M3, M4, M7, M8, M9, M11, and measures discarded at an early stage
Business survey	Businesses: manufacturers, retailers, repairers	BG, EE, FR, AT, GR, HU, IT, NL, PL, RO, ES, SE	Phones, TVs, Fridges, Laptops, Clothing, Shoes, Cars, Wooden furniture	80 full responses 124 partial responses (almost complete) 160 partial responses (problem definition)	- Problem definition - Measures analysis: M1, M2, M3, M4, M7, M8, M9, and measures discarded at an early stage
1st consumer survey and integrated experiment	Consumers	FR, DE, GR, HU, IT, NL, PL, RO, ES, SE	Consumer survey: Phone, TVs, Fridge, Laptop, Clothing, Shoes, Cars, Wooden furniture Experiment (integrated in the survey): Phone, Fridge, Shoes	1000 per country	- Problem definition - Measures analysis: M3, M4, M7, M11, and measures that were discarded at an early stage
2nd consumer experiment	Consumers	FR, DE, GR, HU, IT, NL, PL, RO, ES, SE	Phone, Fridge, Shoes	800 per country	Measures analysis: M9 (different configurations)

M1: Repair as primary remedy
 M2: Preference for repair in a proportionality test
 M3: Interruption/Suspension of the legal guarantee period
 M4: Extending the legal guarantee period
 M7: Aligning the legal guarantee period for refurbished second-hand goods with new goods
 M8: Replacement with refurbished goods
 M9: Right to repair
 M11: Issuing a repair quote

The table provides detailed information on the main data collection tools used, geographical coverage, topics covered and main findings.

Further details about the data collection methods and results are provided in the subsequent sections and in Annex 1 attached to this report.

Table 8 - Overview of data collection tools

Data collection tool	Geographical coverage	Topics covered	Main findings
Literature review	EU-wide Non-EU	The literature review informed the data collection process of the study. The main results of the literature review have been used in Chapters 3 and 4, while the product-level results are available in Annex 2.	- Regarding the problem definition, the results of the product-level research shows that different factors contribute to the phenomenon of premature disposal of consumer goods (see Chapter 3 of the main study). The problem analysis has, to a considerable extent, been based on insights from product-specific assessments for eight different product categories. Insights concerning these product categories resulted in more general indications concerning the problem of premature disposal. - There is a lack of incentives and insufficient infrastructure to repair products. However, all products selected for this study are theoretically repairable. Hence, the main study aims to present the different repair practices for mobile phones, TVs, laptops, refrigerators, clothes, shoes/footwear, cars and wooden furniture independently from the scale of repair. A distinction is made between repair activities within and outside the legal guarantee in the EU.
Mystery shopping	BG, EE, FR, DE, GR, HU, IT, NL, PL, RO, ES, SE	Results incorporated in chapter 4 - Consumers' experience when seeking remedies for defective products within or outside the legal guarantee - Extent to which consumers are offered with repair solutions within and outside the legal guarantee - Reasons for not getting products repaired by sellers	- Many sellers across all products covered (33-43%) offered repair for defective products within the legal guarantee (more often for smartphones) - In many cases, consumers were directed to the physical shop, as the solution could not be provided over the phone - Results confirm that different repair options exist. For example, the most offered repair solution for smartphones and shoes was to take the product back to the seller who would carry out repair. In the case of refrigerators, the solutions offered were various. In many cases, sellers said that technicians would be sent to repair the issue or perform a diagnosis and then offer a solution. Another solution offered was to return the product to the manufacturer directly
Interviews	NL, FI, UK, DE, SE, EU associations	Results incorporated in chapters 3, 4 and 5 - Insights on problem definition - Market practices regarding repair and replacement of defective goods	- The majority of stakeholders perceive premature disposal of goods as a major problem - The scale of the problem depends on the product group. Repair of cars is not seen as problematic in terms of premature disposal of goods, because defective cars are actually repaired.

Data collection tool	Geographical coverage	Topics covered	Main findings
		- Insights on the repair market - Stakeholders' views on measures proposed to reduce the premature disposal of goods	- Several barriers to the repair market were highlighted - There are two trends in the repair and refurbishment market: repair/refurbishment for electronics is expected to grow, whereas for textiles and shoes it is expected to decline
Business survey	BG, EE, FR, AT ¹⁷ , GR, HU, IT, NL, PL, RO, ES, SE	Results incorporated in chapters 3, 4 and 5 - Market practices regarding repair and replacement of defective goods - Insights on the repair market - Businesses' views on measures proposed to reduce the premature disposal of goods	- Many of the businesses consulted offered repair services for consumers' defective goods (61% of sellers and manufacturers consulted) - In most cases, repair is carried out in-house (69%) but also through authorised (36%) and independent (24%) repairers - The average designed lifetime of the products manufactured varies from four years for smartphones, five years for shoes, six years for clothes, 14 years for cars, laptops, and refrigerators to 19 years for wooden furniture - Measures 1, 2, 3 and 9, set out below are considered by businesses to have the highest potential to address the issue of premature disposal of goods
1st consumer survey and integrated experiment (on measures within the Sale of Goods Directive (SGD))	FR, DE, GR, HU, IT, NL, PL, RO, ES, SE	Results incorporated in chapters 3, 4 and 5 - Attitudes of consumers and their experience of defects and repair services - Experience with buying and selling second-hand and refurbished goods - Assessment of possible policy measures - Experiment: measured likelihood to repair under different policy measures and willingness to pay for second-hand and refurbished goods	- Attitudes among consumers are split when it comes to repairing products. A majority states that they are not likely to have a defective product repaired - The experience with repair services is largely positive. Those consumers who choose to have their product repaired report a high satisfaction with the service that they experienced. - The experiment showed that extending the guarantee period only for repairs has a highly significant impact on consumers' likelihood to choose repair over replacement - Aligning the guarantee period for used products with the guarantee period for new products significantly increased the amount consumers who were willing to pay for used products
2nd consumer experiment on the Right to Repair (outside the SGD)	FR, DE, GR, HU, IT, NL, PL, RO, ES, SE	Results incorporated in chapters 3, 4 and 5 Experiment on the magnitude of barriers to repair created by the costs incurred when asking repairers for a quote on the price of the repair service	- The experiment tested scenarios outside the legal guarantee, where consumers are not entitled to a remedy and need to pay if they wish to replace / repair a good. - Costs for getting a quote on price of repair create a significant barrier that prevents consumers from commissioning repairs. The higher the costs, the more likely it is that consumers who would be willing to commission a repair are deterred from doing so

¹⁷ For the business survey a B2B sample of businesses was used for dissemination. Due to stricter data collection rules, Germany was replaced with Austria for the business survey.

Data collection tool	Geographical coverage	Topics covered	Main findings
		- Experiment on the effect of having access to information about the repair service on the willingness to repair - Conjoint analysis to test consumers' likelihood to repair under different configurations of a 'Right to Repair' - Selected survey questions on several aspects (actions taken when considering repairs, effect of product age on repair decision, willingness to pay for extended guarantee)	- Access to information about repair service is important for consumers in some respects. The experiment revealed that information on the price of repair had the biggest effect on consumers' decision to purchase it. The other factors that were tested, the duration and the handling of the repair, had a considerably lower impact. - The conjoint analysis revealed that in different configurations of a hypothetical 'Right to Repair' for consumers, the price level of repair was the most important component that drives respondents in their decision whether to repair or not to repair their defective product

2.2.1. Mystery shopping

We used a mystery shopping approach to assess the extent to which repair was currently being offered to consumers. In each of the 12 MS, mystery shoppers made 50 contacts with retailers, pretending that a product that they bought with that retailer was defective and asking for information about any subsequent steps. The frequency with which the retailer offered repair or replacement as the default option was recorded. The mystery shopping concerned three types of products: fridges, smartphones, and shoes. There were also two scenarios: one where the product was still under the legal guarantee and a second one where the legal guarantee had expired.

The tables below give an overview of the number of observations per MS, product, and scenario.

Table 9 - Overview of mystery shopping observations per country and product

Country	Fridge	Phone	Shoes	Total
BG	18	17	15	50
DE	18	16	16	50
EE	18	16	16	50
ES	18	16	16	50
FR	18	16	16	50

Country	Fridge	Phone	Shoes	Total
GR	18	16	16	50
HU	18	16	16	50
IT	18	16	16	50
NL	18	16	16	50
PL	18	16	16	50
RO	17	17	16	50
SE	18	16	16	50
Grand Total	215	194	191	600

Table 10 - Overview of mystery shopping observations per product and scenario

Products	Scenario 1 (under legal guarantee)	Scenario 2 (outside the legal guarantee)	Total
Fridge	107	108	215
Phone	96	98	194
Shoes	96	95	191
Grand Total	299	301	600

2.2.2. Key informant interviews

In total 21 expert and stakeholder interviews were undertaken as part of this study. Several additional stakeholders provided written input to interview questions. The interviews were conducted in two waves. In the first wave, interviews focused on the problem definition and the market analysis description, whereas the second wave of interviews was used to refine the impact assessment and the interim report.

First wave of interviews

Preliminary interviews were performed with the aim of scoping the main aspects of the research tasks. Moreover, the objective was to lay the groundwork for the main literature and data gap analysis.

Therefore, to guarantee a well-structured and targeted data collection, preliminary interviews were conducted with academic practitioners and experts. Interview partners were selected in accordance with the research tasks of this study. Consequently, the research

team primarily selected interviewees whose expertise related to one or more of the following subjects:

- a) useful life of consumer goods;
- b) behavioural perspectives of product lifetime; and
- c) the value chain for repair, refurbishment, and second-hand sale as well as current market practices.

Table 11 provides an overview of the expert organisations that were contacted for interviews. Furthermore, for each of the experts, the table indicates the main subject on which the respective expert organisation was interviewed (or contacted). However, it should be noted that most organisations covered a broad array of research areas and hence many interviewees were able to provide relevant data and information on multiple subjects.

Table 11 - Selection of expert stakeholders and organisations who provided input to this project during the first wave of interviews

Institution	Main subject	Relevance
University of Delft (Netherlands)	Useful life of consumer goods, information used for problem definition	Member of Product Lifetimes and The Environment (PLATE) platform
University of Delft (Netherlands)	Useful life of consumer goods, information used for problem definition	Member of PLATE platform
Nottingham Trent University (United Kingdom)	Useful life of consumer goods, information used for problem definition	Member of PLATE platform
Aalto University (Finland)	Useful life of consumer goods, information used for problem definition	Member of PLATE platform
Fraunhofer IZM Berlin	Useful life of consumer goods, information used for problem definition	Project leader of PROMPT project
Lund University (Sweden)	Behavioural perspectives of product lifetime, information used for problem definition	Based on recommendation by other experts
Lund University (Sweden)	Value chain for repair, refurbishment and second-hand sale, information used for market analysis and problem definition	Research focus on product repair and environmental policy and regulation.
RREUSE	Value chain for repair, refurbishment and second-hand sale, information used for market analysis and problem definition	RREUSE is an international network representing social enterprises active in re-use, repair, and recycling
University of Delft (Netherlands)	Value chain for repair, refurbishment and second-hand sale, information used for market analysis and problem definition	Research focus on design approaches for repair, remanufacturing, and reuse.
Right to Repair Europe	Value chain for repair, refurbishment and second-hand sale, information used for market analysis and problem definition	EU wide campaign to promote repair

Institution	Main subject	Relevance
Runder Tisch Reparatur	Value chain for repair, refurbishment and second-hand sale, information used for market analysis and problem definition	German initiative to promote repair

12 experts provided input to this project via interview or e-mail. Interviews were performed with nine different experts, while three experts provided information and data via e-mail. Furthermore, five experts were not available for an interview and two did not respond to the interview request. It should also be noted that in some cases, interviews were attended by multiple experts of an institution.

The preliminary interviews were conducted in a semi-structured manner to allow the identification of a wide range of relevant data. The list of questions was developed in accordance with the subjects a) to c), also taking into consideration the expertise and research focus of the respective experts (please note that details on the interview guides, i.e. the list of questions, is included in the inception report).

The list of questions was provided to the interviewees in advance to enable sufficient preparation and reflection. In addition, interviewees were asked to provide input on relevant publications concerning the different subjects and additional relevant experts and stakeholders who might be contacted for further consultation.

Second wave of interviews

At the beginning of 2022, additional interviews with more targeted questions were conducted. The second wave allowed to close remaining gaps of the first draft of the report and to get first impressions on potential impacts of the proposed policy measures. Several experts who were identified in the first wave were contacted again for targeted interviews on the specific topics related to the data gaps. Additionally interviewed stakeholders are listed in the table below. Independent Retail Europe (IRE) and European Furniture Industries Confederation (EFIC) replied via e-mail.

Table 12 - Selection of expert institutions who provided input to this project during the second wave of interviews

Institution	Main subject	Relevance
Restart Project (leading the repair.eu campaign)	Repair and refurbishment value chains, information used in chapter on 'market analysis'	EU wide campaign to promote repair
Backmarket	Repair and refurbishment value chains, information used in chapter on 'market analysis'	Leading provider of refurbished goods
Vangerow GmbH	Repair and refurbishment value chains, information used in chapter on 'market analysis'	Repair service provider
The European Federation for Furniture Retailers (FENA)	Repair and refurbishment value chains, information used in chapter on 'market analysis'	Industry Association with focus on furniture
BEUC – European Consumer Association	Policy measures	Consumer organisation
Euro commerce	Policy measures	Business organisation
Ecommerce	Policy measures	Business organisation
European Environmental Bureau (EEB)	Policy measures	Network of environmental citizens' organisations

Institution	Main subject	Relevance
APPLiA - Home Appliance Europe	Policy measures	Business organisation
Reparably	Policy measures	Label / certification organisation
Free ICT Europe	Policy measures	Business organisation
The Restart Project	Policy measures	NGO

2.2.3. Survey of businesses

In addition to the mystery shopping and stakeholder interviews, we undertook a survey of businesses. The businesses targeted by the study fell into either of these categories: manufacturers, retailers, or repairers of either of the products concerned by the primary data collection. Only businesses producing, selling, or repairing cars, laptops, clothing, mobile phones, shoes, wooden furniture, televisions, or refrigerators were included in the survey.

The survey was undertaken online and was translated into the languages of the 12 MS covered by this study.

The analysis of survey results also includes the analysis of partial responses, i.e. responses of respondents who dropped out during the survey, provided they answered at least some substantive questions (at least half of the questions are answered). Therefore, the number of respondents varies depending on the question. Furthermore, many questions were filtered and only asked from certain types of business (i.e. only repairers or only retailers). This again means that the number of respondents varies per question.

Due to the survey length, the questionnaire was divided into two parts. On the completion of the first part respondents were asked whether they wanted to continue with some additional optional questions.

Overall:

- 88 respondents fully completed the first part of the survey
 - o 124 respondents completed a substantial part of the survey (more than half of the questions)
 - o 160 respondents completed at least the initial questions about the extent to which they offer repair or replacement for defective products
- 32 of these respondents proceeded with additional questions

The respondents were split in a balanced manner between micro enterprises (30% of the sample), small businesses (35% of the sample), medium-sized companies (18%) and large companies (17%).

2.2.4. 1st consumer survey and integrated experiment

A first behavioural experiment was conducted to measure the effects of certain policy options in the context of the SGD ¹⁸ on the behaviour of consumers. In particular, the experiment was concerned with behavioural aspects around:

- The interruptions and suspension of the legal guarantee period for the time of the repair
- The extension of the legal guarantee period
- The alignment of the legal guarantee period for second-hand goods to newly produced goods
- The alignment of the legal guarantee period for refurbished second-hand goods with new goods.

The experiment was designed as a parallel group study that gauged the effects of the policy options in question on the participants' likelihood to have a defective product repaired or replaced. For the alignment of the legal guarantee period, the experiment captured the amount of money respondents willing to pay for a used product that comes with different commitments regarding the legal guarantee period. In particular, it was tested how much consumers' willingness to pay differs between used products that have a one-year legal guarantee period and a two-year legal guarantee period.

The experiment was conducted as part of an online survey. The online survey was carried out in a total of 10 MS of the EU and included a sample of at least 1000 respondents per country. The MS covered were France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Romania, Spain, and Sweden. The selection of MS was determined by a multitude of criteria, including geographical coverage, population size, known repair behaviour of the population and existing legal framework.¹⁹

Participants were selected from an online survey panel. This selection was carried out with a quota-based sampling approach applying fixed quotas based on national population statistics for each MS of the study (on age, gender, region, with additional monitoring of soft quotas on factors like education and income). The fieldwork was carried out between 6 and 28 April 2022. Overall, 10.144 participants took part in the experiment. The achieved sample is representative for the general population of 18 years old and older in each of the MS.

For the experiment, the participants in each MS were allocated with equal chance into 10 groups (thus approximately 100 respondents per group and MS). This fully random allocation of participants to experimental groups ensured that the results were free of bias that could be introduced e.g. by the different sociodemographic backgrounds of participants. In the experiment, the participants were presented with various stimuli, e.g. a short text describing the consumer scenario for a product repair and an accompanying image. Such exposure is also called the experimental treatment. The stimuli they saw were determined by the experimental group to which they were allocated. Participants that belong to the same experimental group received the same treatment. The experiment tested four policy

¹⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019L0771>.

¹⁹ The country selection is described in detail in Annex 1 of the study.

measures with 19 treatments and three types of products (smartphone, pair of shoes, refrigerator). The treatments related to the following policy measures:

- M3. Interruption/suspension of the legal guarantee period (treatments T3)
- M4. Extending the legal guarantee period (treatments T4)
- M6 and M7. Aligning the liability period for second-hand/refurbished goods to newly produced goods (treatments T5)

The experiment combined a within-subject design (regarding the products) and a between-subject design (regarding the treatment assumptions). A within-subject design means that the effect of the experimental treatment is measured by giving the same individual (subject) a series of scenarios in which the variable of interest is altered. For example, a participant receives the same consumer scenario, but the type of product in each scenario is altered. The effect of the variable is then measured by comparing the effects on the same participant. On the other hand, the difference in the effect of the legal assumptions was effectively measured by comparing the effect on different participants. This effect was therefore measured in a between-subject design. Participants were sorted into different groups. Each group received a scenario with specific underlying assumptions (e.g. a scenario in which the guarantee period can be suspended for the period of the product repair). The effect of the variable was therefore measured by comparing the effect on different groups of participants. In a nutshell, each participant was presented with descriptions of consumer scenarios related to two out of the three products (randomly assigned and in random order) and, for each product, received two of the 19 possible treatments.

2.2.5. 2nd consumer experiment

Furthermore, a second behavioural experiment was conducted to measure the potential effects of introducing a 'Right to Repair' on the behaviour of consumers. Specifically, the experiment was concerned with behavioural aspects of:

- Consumers' lack of information when planning to commission a repair
- The effect of diagnosis costs as a barrier for consumers to repair
- Relative importance of factors such as price and duration when deciding for or against a repair

This experimental study was split into three separate sub-experiments. In the first sub-experiment, participants were exposed to a situation in which they needed to decide whether or not they would commission the repair of a defective product, with varying degrees of information available to them. The second sub-experiment measured the effect of different levels of repair diagnostic costs on the likelihood of participants to commission such an assessment of repair costs. Participants received different levels of price information for a diagnosis and were subsequently asked about their likelihood to commission the diagnosis. Both sub-experiments were designed as a parallel-group study. The third sub-experiment tested in a conjoint analysis design the relative importance that the different factors of a repair offer may have for respondents. Relative importance of factors means here the weight each factor has in participants' decision when it comes to purchasing the repair or not, for example, how much their decision is influenced by the price they will have to pay for the repair relative to the duration of the repair. The four factors tested were handling, price, responsible party, and duration of the repair.

The experiment was conducted as part of an online survey. The online survey was carried out in a total of 10 MS of the EU and included a sample of at least 800 participants per MS. The MS covered were France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Romania, Spain, and Sweden. The selection of MS was determined by a multitude of criteria, including geographical coverage, population size, known repair behaviour of the population, existing legal framework.

Participants were selected from an online survey panel. This selection was carried out with a quota-based sampling approach, applying fixed quotas based on national population statistics for each MS of the study (on age, gender, region, with additional monitoring of soft quotas on factors like education and income). The fieldwork was carried out between 16 and 27 May 2022. Overall, 8,032 participants took part in the experiment. The achieved sample is representative for the general population of 18 years old and older in each of the MS.

The participant sample was split and respondents either participated in the first sub-experiment or the second sub-experiment. The participants were allocated with 60% probability to the first sub-experiment (with around 4,800 participants in total) and with 40% probability to the second experiment (with around 3,200 participants in total). This split of participants between the two sub-experiments was completely random, ensuring an unbiased allocation of the sample. While in the first sub-experiment three types of products were tested (smartphones, refrigerators, pairs of shoes), the second sub-experiment tested two types of products (smartphones, refrigerators). Since the cost for receiving a repair quote is less relevant in the case of shoes, this product type was not included in the second sub-experiment.

All respondents participated in the third sub-experiment, in which participants' implicit preferences for different factors in relation to repair services were tested. The sub-experiment used a conjoint analysis design to elicit the relative importance of various factors for consumers in a situation where they would claim a right to repair. The factors tested were price and duration of the repair, the handling of the product, and the party that is responsible for the repair.

2.2.6. Internal online expert workshops

The study team conducted several internal online expert workshops. The expertise of participants was a valuable source of insights for:

- Problem definition: centred on repair, production, markets and the players' practices, the experts oriented our research and provided more insights and resources where necessary.
- Assessing impacts of policy measures: evaluating the impacts of the current situation and the potential impacts of the proposed measures.

The table below presents the experts that contributed to the study.

Table 13 - Short profile description of the experts' profile for the consultative group

Name of the expert and capacity	Description of their profile and expertise
Colin Fitzpatrick Senior expert	Prof Colin Fitzpatrick is Head of Department and an Associate Professor in the Department of Electronic & Computer Engineering at the University of Limerick, Ireland. His expertise is on the circular economy and waste management. Aside from research, he has also advised Irish and European agencies on the matter for high level endeavours such as H2020.
Lise Magnier Senior expert	Lise Magnier is Assistant Professor of Sustainable Consumer Behaviour at the Faculty of Industrial Design Engineering - TU Delft. Her main research interests lie in the fields of sustainable consumer behaviour, de-consumption, and the circular economy. Lise contributes to the H2020 PROMPT project on user and market-related factors of premature obsolescence.
Valerie Swaen Senior expert	Dr Valerie Swaen is specialised in management and Corporate Social Responsibility (CSR) and has conducted research that has been widely published in peer reviewed journals. She has headed the Louvain CSR network since its creation and helps practitioners to develop CSR activities and communication.
Joasia Luzak Senior legal expert	Prof Luzak specialises in consumer law and has over 15 years' experience in data protection law and contract law. She has a solid track record on the matter as evidenced by the number of publications to which she has contributed.

3. General assessment of a possible phenomenon of premature disposal of consumer goods

3.1. Problem definition

The lifetime²⁰ of consumer goods has generally decreased since the late 1980s due to a range of reasons (De Schoenmakere & Gillabel, 2017)²¹. However, both the market practices concerning consumer goods and the behaviour of producers and consumers play important roles in today's 'throw-away society' and hence in the needed transition towards a circular economy. Many products are currently produced to last for a limited time (Bachér et al., 2020) or disposed of for other reasons than being broken 'beyond' repair (van den Berge et al., 2021).

In the context of the 'Sustainable consumption of goods' initiative the term 'premature disposal' is used to capture the phenomenon of discarding viable and repairable consumer goods. Premature disposal of consumer goods is directly related to the phenomenon commonly referred to as 'obsolescence' (Prakash et al., 2019). In the Impact Assessment of the ECGT initiative the term 'early obsolescence' is introduced. It is defined as 'Consumers are sold products that do not last as long as they could, or consumers expect'.

Premature disposal according to the 'Sustainable consumption of goods' initiative	Early obsolescence according to the ECGT initiative from the European Commission
Discarding viable and repairable consumer goods	Consumers are sold products that do not last as long as they could, or consumers would expect

In literature the term 'planned obsolescence' is commonly used and has also attracted public attention (Makov & Fitzpatrick, 2021). Planned obsolescence can be understood as the act of intentionally shortening product lifetimes by integrating predetermined weak points designed by the manufacturer in order to keep demand for new products high (even in saturated markets) (Makov & Fitzpatrick, 2021; Maycroft, 2009). In the past, there were several cases with sealed drums in washing machines or ink cartridges with a chip that prevented their reuse. However, it is extremely difficult to prove the phenomenon of 'planned' obsolescence (Bachér et al., 2020) because available data does not allow a conclusion on whether planned obsolescence can be considered a confirmed phenomenon (Hennies and Stamminger, 2016).

²⁰ Please note that in their study, De Schoenmakere & Gillabel (2017) refer to the term 'lifespan', which is usually defined as the period from product acquisition to its disposal by the final owner. The period includes any repair, refurbishment or remanufacturing and periods of storage when the product is no longer in use — also called dead storage or hibernation.

²¹ When assessing the development over the past decade, the availability of comprehensive, reliable, and up-to-date data on the useful life of consumer goods is rather scarce as much data in relevant literature dates back to the 2000's.

Obsolescence has many forms and other types of obsolescence are also affecting the lifetime of consumer goods, e.g. when fashion affects the lifetime of products through 'stylistic obsolescence' as they become 'out of date' at a certain point (Maycroft, 2009). Psychological and economic obsolescence are two other types of obsolescence described by Prakash et al. (2019). Psychological obsolescence refers to the consumers' attraction to novelties (see stylistic obsolescence) and hence appreciation for innovative companies that offer new products with improved functions and utility. Economic obsolescence concerns the evaluation of repair costs compared with buying new products, and it is in most cases the key factor for decisions pertaining to repairs and hence essential for changing the average consumption lifetime of products.

As shown above, different factors contribute to the phenomenon of premature disposal of consumer goods. In this regard, relevant scientific literature indicates that it is difficult to draw general conclusions concerning relevant factors across different product categories because – depending on the type of product – various factors can affect premature disposal. As such, the problem analysis in this chapter has, to a considerable extent, been based on insights from product-specific assessments for eight different product categories. Insights concerning these product categories (see Table 14) resulted in more general indications concerning the problem of premature disposal.

Table 14 - Overview of the problem of premature disposal in the product categories assessed

Product	Is there a potential problem of premature disposal?
Mobile phones/Smartphones	Yes. Data suggest that the average consumption lifetime of smartphones has decreased over the last decade. Smartphones are often subject to replacement although they still function. Besides other factors, this behaviour contributes to a discrepancy between the absolute lifetime and the consumption lifetime of smartphones. This discrepancy indicates that premature disposal represents a relevant problem in the case of smartphones.
Televisions	Yes. While the sales numbers of televisions are increasing, their average first-use period reveals a decreasing tendency. This can mainly be attributed to the fact that a large share of televisions is disposed of despite still being functional. Furthermore, televisions are rarely repaired and purchasing a new device in the event a failure has become more customary than in the past.
Refrigerators	Yes. Refrigerators have a relatively long absolute lifetime. However, data suggests that the consumption lifetime of refrigerators might be significantly lower than the absolute lifetime. Thus, a considerable number of refrigerators is disposed of before having reached the end of their absolute lifetime. Furthermore, high repair costs seem to represent a main barrier to repair.
Laptops	Yes. Data shows that a large share of laptops fails within the first service years due to malfunctions and/or accidents or are replaced despite being functional. As a result, laptops often have a very short consumption lifetime. Repair is limited especially due to the integrated design of laptops and the high repair costs.
Clothing	Yes.

Product	Is there a potential problem of premature disposal?
	As a result of the 'fast fashion' ²² business model, clothing is produced for a small price leading to cheap quality and a short absolute lifetime. Moreover, the consumer behaviour also contributes to such a short consumption lifetime. Therefore, the phenomenon of premature disposal is highly relevant in the case of clothing. In addition, the repair rates in the case of clothing are low.
Shoes/Footwear	Yes. Although there is a lack of data on the absolute and consumption lifetime of shoes and footwear, there are indications that the consumption lifetime is decreasing and that a significant share of shoes is disposed of before having reached the end of their absolute lifetime. Similar to clothing, the 'fast fashion' business model contributes to the premature disposal of shoes and footwear.
Cars	No. Even if clear evidence is not available, data indicates that both the average age of cars in use and the average age of End-of-Life Vehicles (ELV) tend to increase. Premature disposal of cars may be an issue at least in some cases however, considering the consumer propensity to repair, this problem is less relevant for this product group. Repair and second-hand car markets seem to gain more importance.
Wooden furniture	Yes; for products made of lower quality. In low-cost furniture, solid wood is replaced with other cheaper wood-based materials like chipboards and medium density fibre boards (MDF). The use of cheap wood replacements affects the strength and quality of furniture items, thus reducing the absolute lifetime of the products. Typically, lower quality products are poorly designed, not robust enough and not intended for disassembly and reassembly. No. for products of high quality. Solid wooden pieces of furniture, if well designed, constructed, and maintained, may last almost indefinitely.

Based on this analysis, as well as on a number of more general insights from literature²³ and conducted surveys, it can be concluded that premature disposal reduces the consumption lifetime of consumer goods, which entails significant environmental (see chapter 3.5. Environmental impacts) and economic impacts (see chapter 3.6. Economic impacts)²⁴. Thus, the main problem as defined within the study is the short consumption lifetime of consumer goods.

²² The EU Strategy for Sustainable and Circular Textiles defines fast fashion as trends of using garments for ever shorter periods before throwing them away and that contribute the most to unsustainable patterns of overproduction and overconsumption. More information at: https://eur-lex.europa.eu/resource.html?uri=cellar:9d2e47d1-b0f3-11ec-83e1-01aa75ed71a1.0001.02/DOC_1&format=PDF

²³ See Annex 2, Chapter 3

²⁴ In this context, it should be noted that the product lifetime cannot always be used as a proxy for the active use of products. Hence **limited use intensity of products** is another aspect closely connected to premature disposal. It is however not considered to lie completely within the phenomenon of premature disposal as this concerns consumer habits during the use phase rather than the premature disposal of the product, and quite often will lead to a long but inefficient lifetime. When measuring the development in the lifespan of clothes, for example, it can be relevant to measure the number of times that the clothes have been worn rather than the number of years for which they have been owned, as some clothes are stored in the closet for years without being used. This aspect could affect economic and environmental impacts,

The short consumption lifetime refers to the product lifetime as influenced by the consumer's behaviour towards repair as well as by consumer preferences of disposing products for other reasons than the product reaching the end of absolute lifetime. Therefore, product lifetime is 'an outcome of 'the nature' of a product (absolute lifetime) and its 'nurture' by consumers (consumption lifetime) (Knight, King, Herren & Cox, 2013 p. 21). According to the consumer survey, for most of the product categories assessed, more than half of the consumers prefer replacement over repair²⁵ if a defect occurs (see chapter 3.3. Scale of the problem). Considering that a significant share of products might fail within the first service year (see paragraphs below) and the preference of consumers for replacement, defects can substantially reduce the lifetime of consumer goods if they are not repaired.

Short product lifetimes of consumer goods are also reflected in the results of the consumer survey conducted as part of this study. Nearly a quarter of consumers believe that a product typically becomes defective within the first year of its lifetime. A quarter of respondents stated (when asked specifically about the product categories covered) that they experienced defects that would hinder the product from being used within the two-year guarantee period²⁶. This does not necessarily mean that the damage is fully detrimental to the use of the product and such damage may well be due to the way consumers make use of the product. However, this data shows that consumers perceive that the products covered in this study deteriorate relatively quickly.

One of the questions of the consumer survey asked consumers about the time until a defect (resulting in the product no longer functioning properly) typically occurred after buying a new product (see Figure 5). Overall, independent of the product, 8% of respondents stated that the defect occurred in the first three months and another 15% said it occurred between 3 and 12 months from purchase. As shown below, there are notable differences between product categories. Clothing and footwear are most likely to get damaged in the first year of their lifecycle.

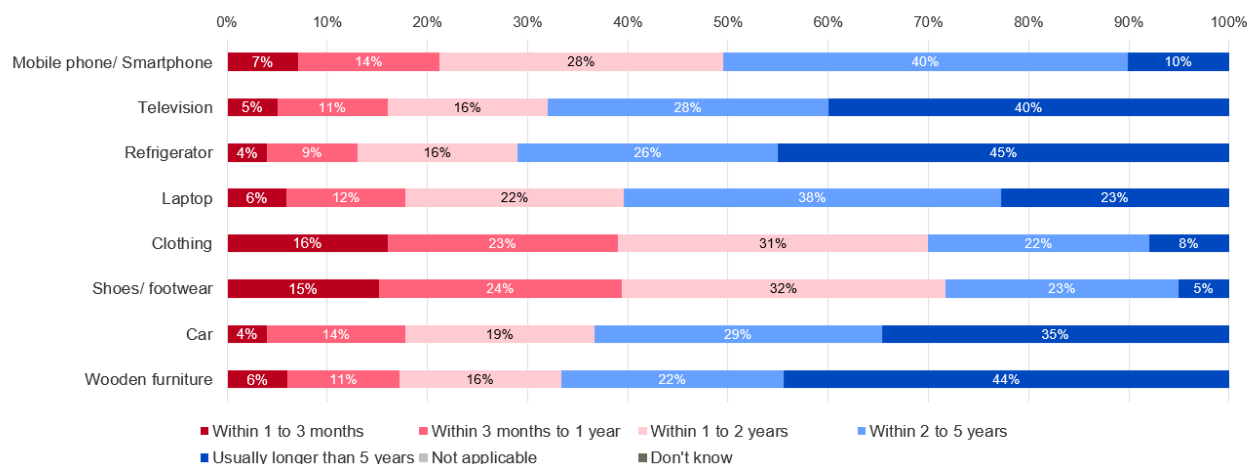
which potentially could be reduced by intensifying the use of a product, e.g., by shared economy business models.

²⁵ As part of the consumer survey conducted for this study, consumers were asked about the propensity to have a product repaired or replaced. However, it should be noted that the question was based on the assumption that the defect occurred within the legal guarantee period.

²⁶ In some MS the legal guarantee is longer than two years.

Figure 5 - Perceived time until a defect occurs in each of the product categories assessed within this study

QC1: In general, after buying a new [PRODUCT], how long do you think it takes until a defect occurs that results in the product no longer functioning properly?

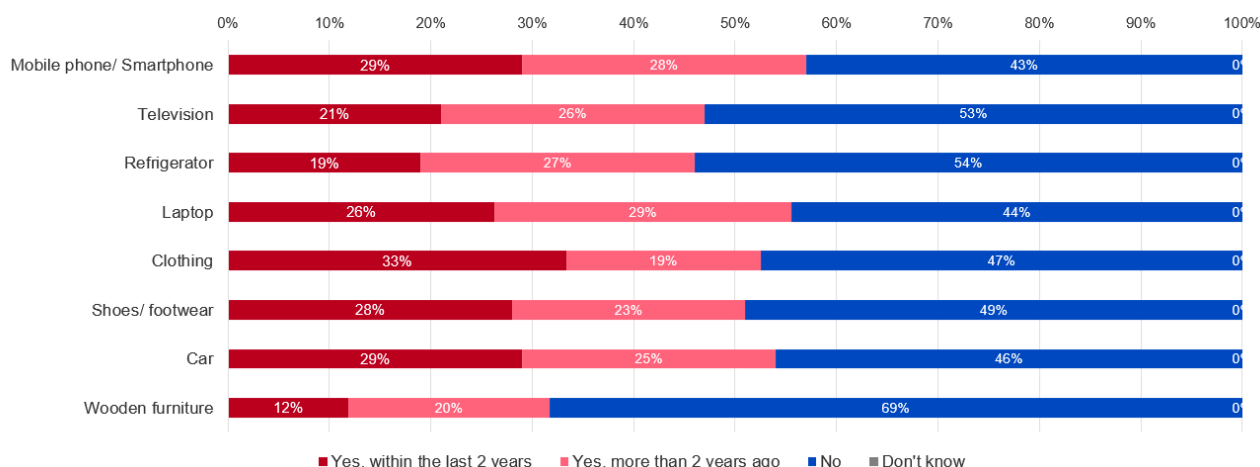


Source: Authors based on consumer survey results

Furthermore, consumers were asked whether they experienced a situation where the product had a defect which resulted in the product no longer functioning properly. Half of them stated that they had such an experience (all products included). For a quarter (25%) of respondents, this happened within the last two years at the time the survey was conducted²⁷. For another quarter this happened more than two years before the survey was conducted. This again varies across products (see Figure 6). Clothing, mobile phones and shoes are most likely to encounter defects in the first two years of their lifecycle.

Figure 6 - Experience of defects in the past in each of the product categories assessed within this study

QC2: In the past, did you have the situation where your product had a defect that resulted in it no longer functioning properly?



Source: Authors based on consumer survey results

²⁷ In some MS the legal guarantee is longer than two years

Overall, based on the descriptions above, the expert interviews, and literature review, two problem aspects were identified which contribute substantially to a short consumption lifetime of products. These problem aspects can be elaborated as follows:

Goods are not used for as long as they could because they are not repaired

Repair has the potential to enable the use of a product for its full designed lifetime, or even beyond. However, the problem analysis shows that a considerable share of the studied products is not repaired.

The consumers who experienced a defect were asked what they did when the defect occurred: a third of the consumers (32%) had the product replaced (see figure below), which is comparable to the share that had it repaired (31%). Another 12% of respondents repaired the product themselves. However, the share of products that get replaced is substantially higher for some product categories (smartphones, television, refrigerators, shows). Cars get repaired frequently, as one would expect given the price of these goods. Laptops and wooden furniture also get replaced less often than the other categories.

Figure 7 - Share of respondents across all products according to what they did when a product got defect (n=9928)

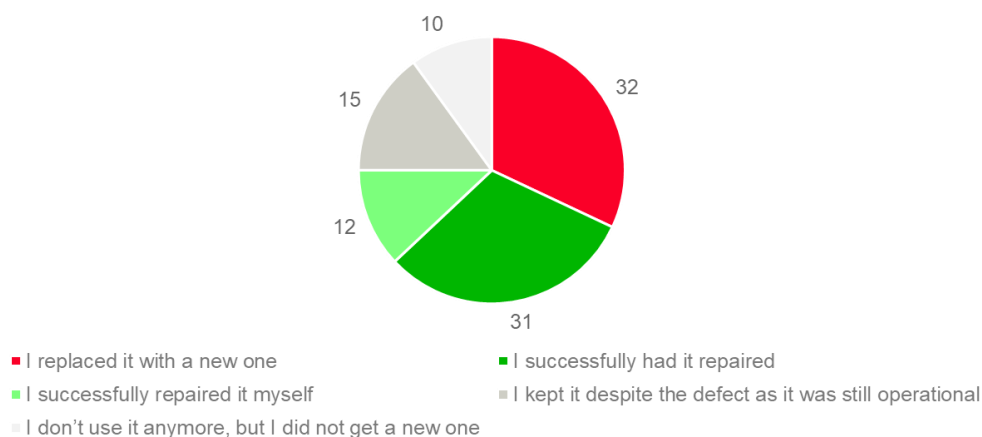
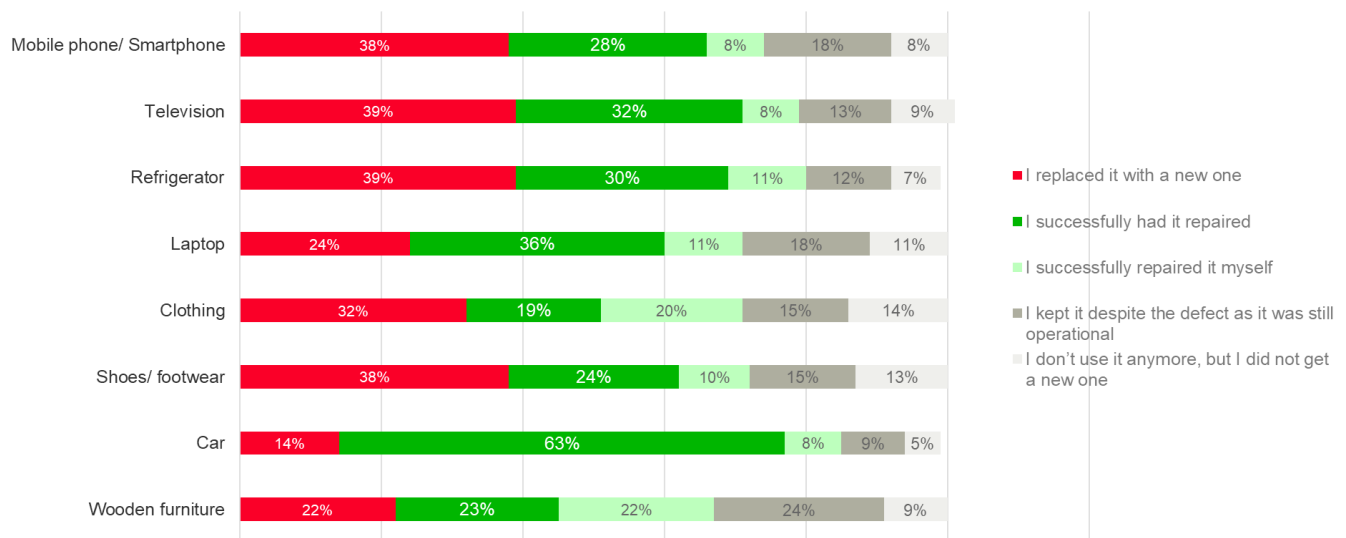


Figure 8 - Share of respondents according to what they did when a product got defect by product category (n=9928)



There are several reasons that hinder repair, resulting in goods not being used for as long as they could be. The most relevant reasons are described in the paragraphs below and are complemented by relevant results from the business survey and the consumer survey.

One important factor in this context refers to the product lifetime as influenced by choices made in the product's design and production phase (short absolute lifetime of products as designed by producers). The absolute lifetime of products can be affected by consumer's actions towards basic maintenance (such as e.g. descaling of coffee makers), but also by the design of the product, as evidenced by the results of the business survey. Accordingly, the design of the product can intentionally impede repairs, thereby reducing the lifetime of products²⁸. Moreover, in the consumer survey, between 10% and 15% of consumers mentioned 'impossibility to repair' as a reason for not having a product repaired.

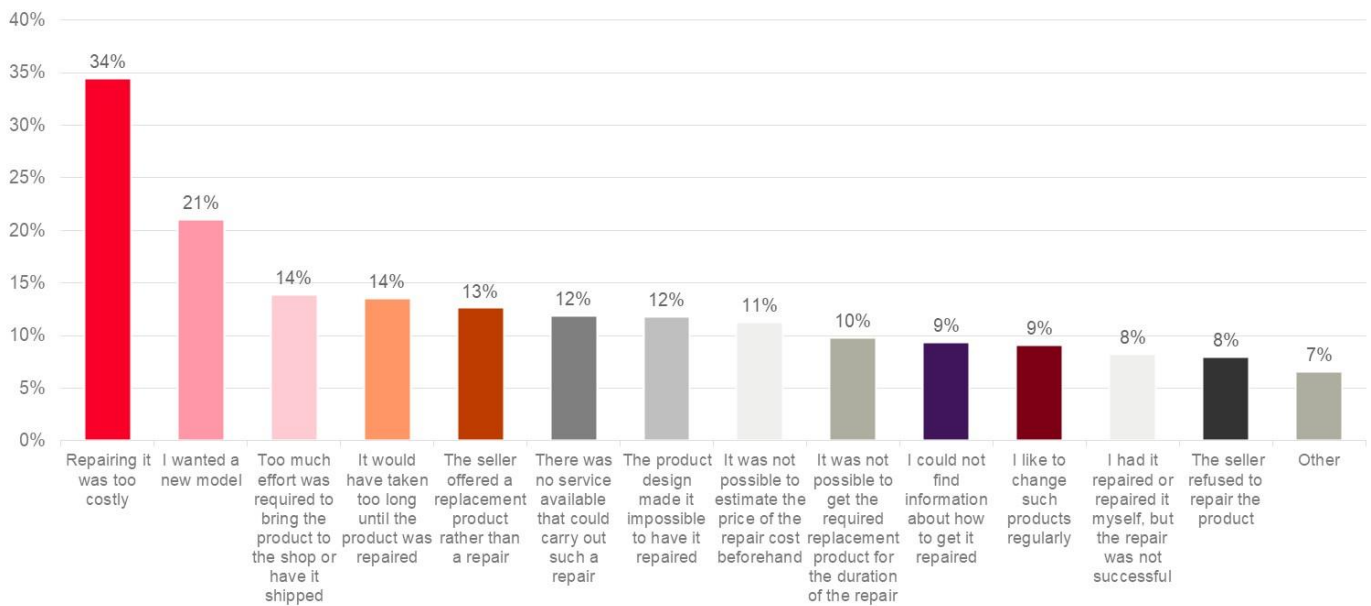
Another reason is the lack of incentives and insufficient infrastructure to repair products. This refers to both lacking incentives for producers to offer repair services or repair tools (e.g. provision of repair information, spare parts etc.) and incentives for consumers to repair their products themselves or externally. If the supply and the demand for repair services is not sufficiently high, the repair infrastructure remains insufficient, inconvenient, and expensive, which contributes to keeping supply and demand low. Since a lack of repair infrastructure leads to lower repair rates and hence to replacing a product instead of repairing, the problem of premature disposal is reinforced.

Overall, the most relevant reason for not having a product repaired as indicated by respondents to the consumer survey was that the repair of the product was considered too costly (by 34% of consumers across all product categories)²⁹. According to the conducted consumer survey, the willingness to pay for repair among consumers ranges between 17% and 27% depending on the product category. Other relevant reasons for not having products repaired are consumer preferences for new goods or the efforts associated with repair.

²⁸ When asked about the reason why a product could not be repaired, 12 respondents (n=38) of the business survey indicated that it was due to 'irreparability by design'. While the sample is not high, it still evidences the presence of the phenomenon of impeded repairs at the conception stage.

²⁹ It should be noted that the answer item on this question was filtered and only offered in case the defect occurred within the legal guarantee period.

Figure 9 - Share of respondents according to why they did not have their product replaced (n=5653)



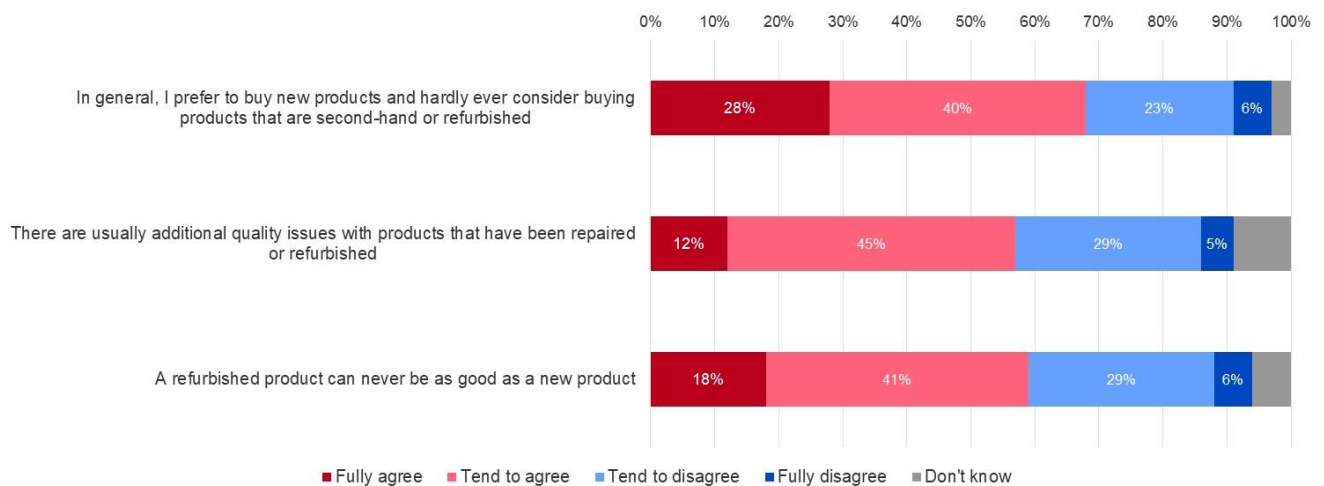
More detailed information on the drivers of the problem is provided in chapter 3.2. Overview of main drivers contributing to the problem and problem aspects

Limited use of second-hand goods by consumers

The other problem aspect contributing to a short consumption lifetime of products is the limited use of second-hand goods by consumers. The replacement of broken products with used (i.e. second-hand) ones enables the extension of the product lifetime of second-hand products and eliminates the need to provide new replacement products. However, the problem analysis indicates that there is a lack of incentives to buy second-hand goods. In addition, availability of second-hand goods seems limited. These factors in turn limit the potential of extending the useful lifetime of products through reuse, refurbishment, or similar activities. Here as well, supply and demand for such products are closely connected and deficits on one or the other side might lead to the consumer tendency to dispose a product instead of reselling/giving it away.

As shown in the chart below, consumers have rather strong preferences for new products over second hand or refurbished products.

Figure 10 - Respondents' attitudes to second-hand and refurbished products (n=10,144)



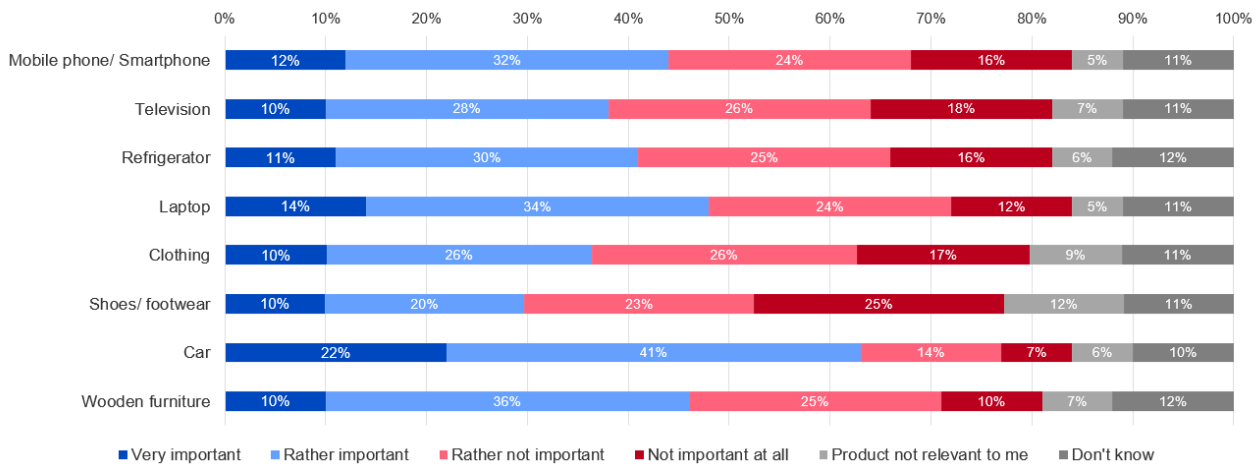
In general, consumers' expectations and perceptions (on quality, durability, reparability, or hygiene, for example) play an important role for a potential consumer bias towards purchasing second-hand or refurbished goods. The way these aspects influence consumer behaviour are described in detail in chapter 3.2.3. Psychological drivers For instance, in the case of smartphones, second-hand devices can be perceived as particularly high risk due to a lack of guarantees, while in the case of clothing, current trends such as fast fashion can be assumed to affect the demand for reused textiles).³⁰ The results of the consumer survey show that only a few consumers buy second-hand goods. The lack of trust in refurbished or second-hand goods is the main reason for consumers not buying such products (see chapter 3.3. Scale of the problem and chapter 4).

Furthermore, Figure 6 shows how important it is for consumers to have the option to buy refurbished or second-hand products instead of new ones. The results show that between 7% and 25% of consumers consider the option to purchase second-hand or refurbished goods not important at all. This indicates that the willingness to purchase second-hand or refurbished goods is limited, at least among a considerable share of consumers. In addition, the results of the consumer survey suggest a negative attitude towards used and repaired products (see chapter 3.2.3. Psychological drivers).

³⁰ See Annex 2, Chapter 3 for more product-level information

Figure 11 - Importance of the option of buying a product second-hand or refurbished rather than a new product for consumers

QD3: For each of the following products, how important to you is the option of buying a product second-hand or refurbished rather than a new product?



Source: Authors based on consumer survey results

3.2. Overview of main drivers contributing to the problem and problem aspects

Various drivers lead to the general problem of a short consumption lifetime of consumer goods and the related problem aspects identified in chapter 3.1. Problem definition Table 15 provides an overview of the drivers which were identified in literature and through expert interviews and surveys, and which have been used for the product-specific assessment. A distinction was made between economic, regulatory, psychological, and other drivers. For the purpose of this study, particular attention was drawn to the economic, regulatory, and psychological drivers which are linked to EU consumer law and the repair of products, while other drivers, such as technical drivers or consumer awareness were not in the focus of this study. A detailed description of the specific meaning of the drivers, including several examples, is provided in chapters 3.2.1. Economic drivers to 3.2.4. Other drivers

The drivers outlined below differentiate between market forces and psychological drivers and therefore represent a condensed version of the initially identified drivers³¹. Moreover, the table below gives an overview of the relationship between the identified drivers and problem aspects. More specifically, it demonstrates that several drivers can apply to different problem aspects, thus underlining that the general problem of a short consumption lifetime cannot be attributed to one specific driver or group of actors. Hence, the problem of a short consumption lifetime of products represents a complex interrelationship between drivers and problem aspects, and it also depends on the various actors involved. It is also important to stress that both drivers and problem aspects can only be generalised to a limited extent as certain drivers can concern certain product types, price ranges or geographies more than

³¹ Please note that the product-specific assessment has been conducted based on the initially identified drivers (economic, regulatory, and psychological drivers (as well as other drivers, where relevant)).

others. An example is the consumers' differing attitudes towards repair and maintenance for different product categories e.g. due to the expected lifetime of the product.

Table 11 provides an overview of the identified economic and psychological drivers and further indicates whether or not these drivers apply to the respective product category. Since regulatory drivers affect all product categories in a rather horizontal way, they were excluded from this overview. The relevance of the single drivers towards premature disposal – and hence, a short consumption lifetime of consumer goods – was assessed based on the information collected through expert interviews, surveys, and literature research. Drivers that apply to the respective product category are marked with an 'X' in Table 15.³²

The results of the business and the consumer survey were used to support our findings and critically assess the relevance of drivers.

For incorporating the results of the consumer survey in Table 15, the response options of the consumer survey to the question about reasons for not having a product repaired were assigned to the drivers as follows:

- 'I wanted a new model' was assigned to the driver 'consumer preferences for new goods';
- 'There was no service available that could carry out such a repair' was assigned to the drivers 'lack of convenient infrastructure';
- 'Repairing the product was too costly' was assigned to the driver 'repair is not economically attractive for consumers';
- 'Too much effort was required to take the product to the shop or have it shipped' was assigned to the driver 'repair is less convenient than buying new products as it requires substantial efforts'; and
- 'The product design made it impossible to have the product repaired' was assigned to the driver 'product's design makes it difficult to repair them'.

The share of consumers who selected the respective response in the consumer survey is indicated in brackets for the corresponding driver.³³ Table 15 provides an overview of the most relevant drivers across all product categories analysed.

³² Therefore, if the driver was not evaluated as being relevant for the respective product category (marked with 'X' in Table 15), it does not necessarily mean that the driver is not relevant, but rather that no respective information could have been identified.

³³ Of course, the response options do not correspond entirely to the contents of the drivers. For instance, there are several response options related to convenience aspects of repair such as the duration of repair, the efforts required to take the product to the shop or have it shipped and also the availability of information on repair.

Table 15 - Relevant drivers per selected product category

Product	Problem of premature disposal yes/no?	Economic Drivers						Psychological drivers			
		Repair is not economically attractive for consumers (i.e. buying new products is cheaper than repair)	Repair is not economically attractive for producers as it limits their sales of new products	Lack of convenient repair infrastructure for consumers	Repair is less convenient than buying new products as it requires substantial efforts	Product's design makes it difficult to repair them	Lack of incentives for producers to make spare parts, repair tools and information on repair available	Consumer preferences for new goods	Lack of trust in repair	Limited consumer acceptance for second-hand goods	Insufficient knowledge to make an informed repair or purchasing decision
Mobile phones/Smartphones	Yes	X (40%)		X (11%)	X (9%)	X (10%)		X (27%)		X	
Televisions	Yes	X (39%)		X (14%)	X (14%)	X (10%)	X	X (24%)	X		
Refrigerators	Yes	X (37%)		(10%)	(14%)	(10%)		(22%)			
Laptops	Yes	X (38%)		(12%)	X (13%)	X (11%)	X	(20%)			X
Clothing	Yes	X (27%)	X	X (11%)	X (18%)	X (15%)	X	X (17%)		X	X

Shoes/Footwear	Yes	X (29%)	X	(14%)	(14%)	X (15%)	X (19%)	X
Wooden furniture	Yes (for products made of lower quality) No for products of high quality	X (31%)	X	(16%)	X (25%)	X (13%)	X (17%)	X
Cars*	No	Not assessed in this table						

* We concluded that the phenomenon of premature disposal does not apply to cars and hence no drivers for this product category are indicated.

Based on this overview, different types of drivers can be identified:

1. **Drivers with high relevance:** These drivers apply to all – or at least most of the – product categories and/or are mentioned by a relatively high share of consumers as reason for not having a product repaired.
 - The most relevant driver is that **repair is not economically attractive for consumers** (i.e. buying new products is either cheaper than repair in absolute terms or the costs are too high compared with a new purchase). This driver applies to all product categories for which the phenomenon of premature disposal has been identified through literature review and expert interviews. Furthermore, according to the consumer survey, high repair costs are the most relevant reason for consumers for not having a product repaired as indicated by 27% to 40% of consumers depending on the product category (average share across all product categories: 34%).
 - Another driver with a high relevance is **the consumer preference for new goods** which applies to five of the seven product categories assessed in Table 11 (marked with an 'X'). However, results from the consumer survey also suggest a high relevance of this driver for laptops and refrigerators. The consumer survey shows that, across all product categories assessed, 21% of consumers stated the wish for a new model as reason for not having a product repaired.
 - A further driver with high relevance refers to **the product design which makes the products difficult to repair**. Based on literature review and expert interviews, this driver applies to all product categories assessed in Table 11 except refrigerators. The results of the consumer survey indicate this driver less important for consumers compared with the high repair costs and the consumer preference for new goods. Depending on the respective product category, it was mentioned by only 10-15% of consumers as a reason for not having the product repaired (overall share across all categories: 12%).
 - **The efforts required for repair** seem to be another highly relevant driver across most of the product categories assessed in Table 11. According to the literature review and expert input, this driver applies to five of the seven product categories. However, results from the consumer survey suggest that its relevance across all product categories varies significantly. The efforts associated with repair seem to be particularly relevant for wooden furniture and clothing (as indicated by 25% and 18% of consumers, respectively) while it seems to be less important in the case of smartphones (9%).
 - Moreover, **the lack of a convenient repair infrastructure** contributes to the problem of premature disposal. While the results of the literature review and expert interviews suggest that this driver only applies to a limited number of product categories, the results of the consumer survey show a similar relevance across all product categories as some of the other drivers described above. Depending on the product category, the lack of convenient repair infrastructure was indicated by between 11 and 16% of consumers as a reason for not having a product repaired.

- Although **limited consumer acceptance for second-hand goods** only applies to three product categories according to Table 11³⁴, this is considered a driver with high relevance since consumers show relatively low experience in buying used goods across most of the product categories assessed. Reasons for that include, amongst others, a lack of trust in used products (see chapter 3.3. Scale of the problem).

2. Drivers with medium or limited relevance: These drivers apply only to a limited number of product categories and are mentioned only by a rather small share of consumers as reason for not having a product repaired. This also includes drivers where no quantitative information on the relevance of the driver was available or drivers that were not linked to the main focus of the study.

Drivers with medium relevance include the following:

- lack of trust in repair
- insufficient knowledge to make an informed repair or purchasing decision
- lack of incentives for producers to make spare parts, repair tools and information on repair available
- repair is not economically attractive for producers as it limits their sales of new products³⁵

More detailed information and explanations on the identified drivers can be found in the chapters below.

3.2.1. Economic drivers

The literature review and expert interviews revealed that several economic drivers contribute to the premature disposal of products. In general, economic drivers do not only include aspects such as the price of repair or new products but also aspects like opportunity costs of repair and manufacturing costs. In total, the following six economic drivers were identified:

- **Repair is not economically attractive for consumers (i.e. buying new products is cheaper than repair):** The likelihood of the disposal and replacement decision of an old device is related to the original market price of the new device (Sabbaghi et al., 2017) and in many cases it is cheaper to buy a new product than to repair a defective one. As the number of cheap (mass) products offered on the market is increasing, repair is less and less worthwhile (Deloitte, 2016). This especially applies to product categories affected by fast cycles of development and innovation like laptops and other electronics, where new versions with better technological features

³⁴ Please note that some authors refer to a limited acceptance of second-hand smartphones, while at the same time there are several indications that the market for second-hand and refurbished smartphones/mobile phones is increasing.

³⁵ It can be assumed that this driver contributes to the high costs of repair and therefore its relevance might be higher than indicated in Table 15.

are launched for cheaper prices than what the cost to make the upgrade for older models would be (Hernandez et al., 2020). Moreover, the quality of many products is often too low to make it worth inserting new spare parts.

Most people are deterred by high costs of repair, stating it as the main reason for not repairing a broken product but instead buying a new product (e.g. Hernandez et al., 2020a; King et al., 2006; Pérez-Belis et al., 2017). In this regard, one of the questions of the consumer survey focused on the reasons for not having a product repaired³⁶. According to the results, the most frequently stated reason by consumers was that the repair of the product was too costly (27-40% depending on the respective product category).

For McCollough (2009), the key factor to increase the willingness to repair is the relative price, i.e. the cost of the replacement in relation to the cost of repair. A study by Hennies & Stamminger (2016) suggests that the willingness to bear the costs of repair strongly depends on the product and price category and on the frequency of use. According to the European Commission (2018a), many EU citizens perceive repair costs as high and thus feel that repairing a defective product is often economically disadvantageous.

McCollough (2007) finds that consumers are willing to pay for repair on average up to 20% of the price of a new replacement good for both large household appliances and smaller electronic appliances. Fachbach et al. (2021)'s survey data from Austria are generally in line with these observations. Interestingly, in their study, the willingness to pay interacts with the respondents' knowledge about the repair network: those who know the network accept higher maximum repair costs (21-35% of the original product price) in comparison to respondents who do not know the repair network (18-31% of the purchase price depending on the product type).

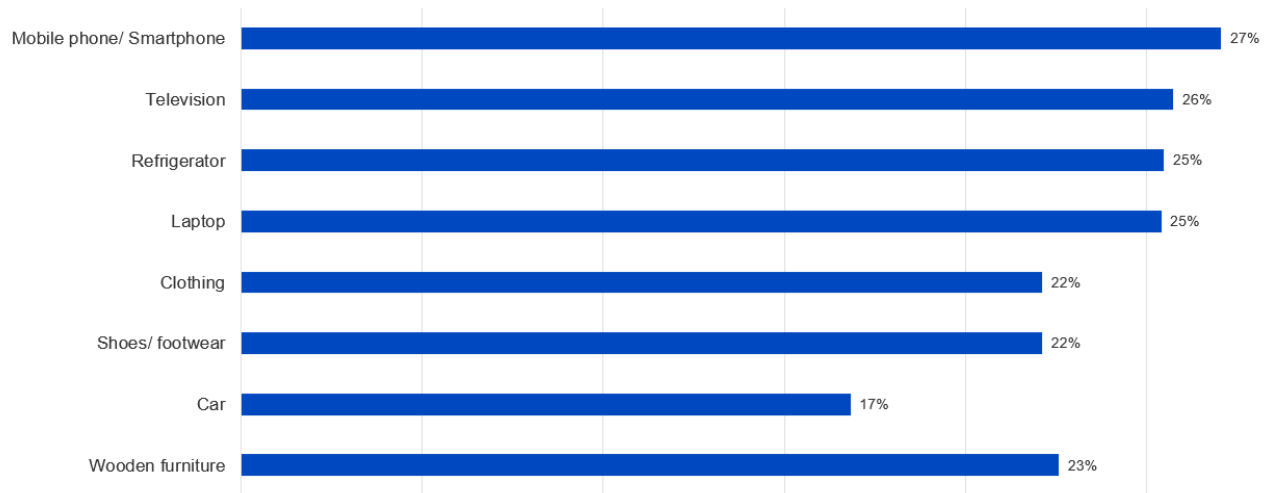
Scott & Weaver (2015), however, refer to the '50% rule' according to which consumers opt for replacement if the cost of repair amounts to 50% or more of the replacement costs. The authors argue that a reduction of the non-monetary costs associated with repairs, like inconvenience and uncertainty, could change this rule of thumb, bringing it closer to a like-for-like comparison.

Data from this study's consumer survey shows that the willingness to pay for repair among consumers ranges between 17 and 27% depending on the product category (see Figure 12).

³⁶ Please note that, within the consumer survey, the answer item on this question was filtered and only offered in cases when the defect occurred within the legal guarantee period.

Figure 12 - Willingness to pay for repair per product category assessed within this study

QB5: How much are you willing to pay for a repair? (average % of original price of the product)

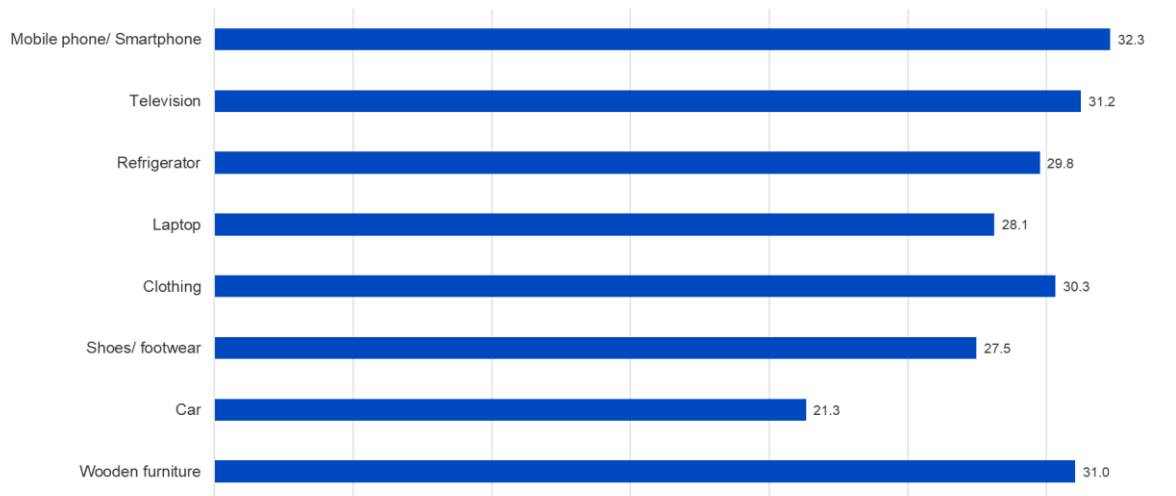


Source: Authors based on consumer survey results

However, the results of the consumer survey also show that the price of repair in relation to the initial price of the product is slightly higher than the consumers' willingness to pay.

Figure 13 - Repair cost relative to initial price

QC12: Approximately how much did the repair cost in relation to the initial price of the product? % of original price



Source: Authors based on consumer survey results

Another reason for low levels of repair demand can be that consumers are price-insensitive for relatively cheap products. McCollough (2007) for example, argues that many government interventions only have a marginal impact on the ratio of repair vs. replacement prices, so product replacement is still too cheap to induce actual behavioural change at current wage rates. Generally, consumer propensity to maintain and repair an item is higher for more valuable and expensive items (Ackermann et al., 2018; Laitala et al., 2021).

Parajuly et al. (2021) surveyed volunteer repairers and reported that while most seem to be motivated by personal values, environmental beliefs, and attitudes towards repair, some indicated that economic incentives would make them more inclined to participate in repair events.

- **Repair is not economically attractive for producers as it limits their sales of new products:** Business models still favour linear production and consumption systems that profit from making and selling the largest number of products possible. There are no clear incentives for producers to facilitate the repair of products when their objective is to sell more new units (Hernandez et al., 2020; Soto Pineda & Prada Salmoral, 2017). A rule of thumb commonly used in the appliance industry is that if the total cost of repair (including parts, labour, expected value-retention) exceeds 50% of the value of the product, then replacement is preferred (Svensson-Hoglund et al., 2021)³⁷. Particularly extensive needs for manual work to perform repair leads to high labour costs and thus high total repair costs.
- **Lack of convenient repair infrastructure for consumers:** With repair infrastructure we mean physical or online places which give a consumer the possibility to get a product repaired. This might include repair shops, repair cafés, online or mobile repair services. The availability of spare parts, repair information and repair tools can also be understood as repair infrastructure as it is the precondition to enable repair. However, in this report we will present this aspect as a separate driver to perform a more targeted analysis. The issue of lacking repair infrastructure is closely related to the next driver (repair is less convenient), as a lack of repair shops often leads to having long travel distances to the next store, which might be perceived as inconvenient. Moreover, heavy products (e.g. fridges) are difficult to transport to a repair shop which requires mobile repair services, i.e. repairers who come directly to the consumer's home. As the repair infrastructures (e.g. the number of repair shops) and the consumers' propensity toward repair are interrelated in a positive feedback loop, the accessibility to the repair infrastructures might increase the demand for repair (Sabbaghi et al., 2017). However, an increase in repair infrastructure might be difficult to reach as all repair actors are faced with high labour costs, but low profits. This leads to low salaries, thus making it difficult for repair businesses to find the skilled labour that they need (especially in countries with high labour costs) (Deloitte, 2016). Within the consumer survey we asked about the reasons for not having a product repaired and between 9 and 16% of consumers indicated that there was no service available that could carry out the repair. This can be seen as an indication that the lack of convenient repair infrastructure might prevent consumers from having their products repaired.
- **Repair is less convenient than buying new products as it requires substantial efforts:** Motivation is a fundamental issue when choosing between repair and product replacement. Such motivation can come from economic, social, or environmental incentives. However, there are no clear economic incentives for consumers to repair a product when they can buy a new one with a more contemporary look for a lower or equal price. Even for users interested in repairing their products for environmental

³⁷ Please see also [Figure 3 - Mapping of study tasks against the steps of an impact assessment + overview of study data collection methods](#) [Figure 3](#) for the results of the consumer survey concerning the willingness to pay for repair.

and social reasons, there is an economic punishment in the form of waiting times, costs, and tasks required to get their products repaired (Hernandez et al., 2020). The business survey conducted as part of this study, for example, showed that the time needed to repair varies from about three days for smartphones to eleven days for TVs (televisions) and twelve for fridges. Given the importance of fridges in our modern life, two weeks waiting time constitutes an important deterrent for repairs, in addition to all the inconvenience linked to the transport. Literature suggests that frictions in the accessibility of repair services significantly lower the attractiveness of repairing products, while the same type of frictions have virtually no effect on the decision to replace a product (European Commission, 2018).

According to literature, convenience is one of the key determinants of repair propensity and future consumption decisions (e.g. Bovea et al., 2017; e.g. Cordella et al., 2021; Laitala et al., 2021; Sabbaghi et al., 2016, Scott & Weaver, 2015). If arranging repair requires too much time and effort, repair decisions are quickly reconsidered (European Commission, 2018a, Terzioğlu, 2021). Therefore, availability of repair services and a high service level from providers are crucial factors (Parajuly et al., 2021). Time also plays a major role: according to Fachbach et al. (2021), the maximum accepted repair time is between 4 and 9 days, strongly depending on the product type. Furthermore, the results of the consumer survey demonstrate the relevance of convenience aspects when deciding against the repair of products. Indeed, consumers stated that one of the reasons for not having a product repaired, was that

- they could not find information about how to get it repaired (between 7 and 13% of consumers);
- it required too much effort to take the product to the shop or have it shipped (between 9 and 25% of consumers); and
- the repair would have taken too long (between 13 and 17% of consumers).

When consumers must arrange repairs themselves as the defect occurs outside the legal guarantee period, transparency and availability of information also contribute to convenience in addition to the points mentioned before. Lopez Davila et al. (2021) report that the most important impeding factors for repair included not knowing the costs of repair upfront, not having access to instructions on how to maintain and repair electronics, and not knowing where to go to repair the electronic devices.

- **The product design makes it difficult to repair them:** The business model of linear production gives limited incentives for producers to make high-quality products with long absolute lifetimes. Furthermore, bad design and manufacturing processes overly focused on costs often result in products not suitable for repair, e.g. due to glued attachments, parts that cannot be removed, cases that break when opened and products that require special tooling (Hernandez et al., 2020). Difficult disassembly and long disassembly times lead to lower profitability of repair or even make it impossible. These assumptions are supported by the findings from the business survey conducted in the course of this study. The responses from 55 manufacturers indicate that manufacturers consider durability (41 manufacturers, 75%) and production costs (32 manufacturers, 58%) as the most important features when designing a product, while reparability (17 manufacturers, 31%) and reusability (9

manufacturers, 16%) of products are regarded as less relevant. Only a slightly higher number of manufacturers (21 manufacturers, 40%) expect that the reparability will become one of the most important features in the next decade. On the other hand, results from the business survey further indicate that, compared with the current situation, the importance of the product durability and recyclability will increase in the next decade (64% and 60% respectively of the 53 manufacturers that responded, see Figure 17 and Figure 18). In addition, between 10 and 15% (depending on the respective product category) of consumers participating in the consumer survey reported that the product design impeded the repair of the product. Furthermore, when asked about what the main reasons were preventing them from repairing a product, 12 of the 22 refurbishment and repair companies surveyed in the business survey also indicated that the design of the products sometimes prevented reparability.

Hatta (2020) furthermore mentions so called systemic obsolescence as a barrier (incompatibility of parts among different models or impossibility to fix newer models with parts from the older models). This might be due to lacking standardisation and interoperability of key components (Deloitte, 2016). Moreover, the current design (miniaturisation, complex products) and short innovation cycles³⁸, which lead to constantly changing designs, make repair a challenge. Conducting non-routine repair would lead to increased labour and operating costs (Wuerthele and Owen, 2018). To stay up to date with new designs and related repair techniques, trainings and skilled employees are key, but might increase the repair costs as well.

- Lack of incentives for producers to make spare parts, repair tools and information on repair available:** The most relevant barriers for repair are closed markets of spare parts and monopolies. Some producers deliver spare parts only to their partners to hinder competition, in a similar manner as in the car industry (Deloitte, 2016). If producers offer information to independent market participants, the level of fees is not the same as for authorised businesses / contract workshops (for the same type and scope of information) (Bizer, et al., 2019). As repair and aftermarket sales are a fundamental part of manufacturers' revenue streams (accounting for 10% to 40% of revenue for industrial companies) (Hanley et al., 2020), it is not surprising that manufacturers favour closed markets and monopolies. Although several ESPR requirements (e.g. for electronic displays³⁹) oblige producers to make spare parts available and to provide repair information, these obligations are limited to certain product groups and are mostly meant for professional repairers. Hence, there are insufficient incentives for producers to make spare parts and repair information available in general, but more specifically to provide them to 'do-it-yourself' (DIY) repair actors (e.g. self-repair at home, repair cafés). Producers argue that maintaining a large inventory or production capacity for spares for product models with long service lives would be very costly for them (Sahyouni et al., 2010) and that the provision of repair information to independent repairers causes safety concerns. However, one stakeholder mentioned that studies showed that this

³⁸ The typical stages an innovation goes through are the initial idea generation to development, implementation, evaluation, and adoption.

³⁹ <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32019R2021&from=EN> (see Annex II (D) (1) & (5)).

argument is not valid. There are only a few cases in which products/parts repaired by DIY or independent repairers caused safety issues. Spare parts are not only difficult to get, but expensive, often require special tools to remove the component (Deloitte, 2016) and often have long delivery times (Bizer et al., 2019). As consumers are very time-sensitive and expect fast repair, they refrain from repair if they must face too long waiting times. Moreover, there is a lack of diagnostic tools that would facilitate repair activities, as well as a lack of training. Due to short innovation cycles, complex (electronics) products and a huge diversity of brands and models require technical skills and continuous training which are difficult to access (Deloitte, 2016). Manufacturers are not incentivised to support repairers in this regard, as they are not obligated to provide maintenance training (Deloitte, 2016). Manufacturers are also not obligated to provide passwords to DIY consumers or independent repairers to open digital locks (Svensson-Hoglund et al., 2021). The lack of information on repair is also reflected in the consumer survey: When asked about reasons for not having a product repaired, 7-13% of consumers reported that they were not able to find information on how to get the product repaired.

3.2.2. Regulatory drivers

Legal mechanisms may contribute to limited life of consumer goods as they consider other market interests by limiting opportunities for repair or second-hand markets.

- **Lack of a regulatory framework (outside the legal guarantee) that would allow consumers to get their defective products repaired at a reasonable price**

The regulatory framework for legal guarantees in the EU is defined by the Sale of Goods Directive (EU) 2019/771 (SGD), which became applicable on 1 January 2022 and replaced the Consumer Sales and Guarantees of Goods Directive 1999/44/EC.

The SGD aims at protecting the consumers by providing a framework based on a mandatory legal guarantee of (at least) two years and a voluntary system of commercial guarantees. It allows consumers to get their goods repaired (or replaced) at no cost. However, no additional provisions are established to ensure that the consumer could get goods repaired beyond the legal guarantee within a reasonable time and price.

According to Article 10 of the SGD, the seller is liable to the consumer for any lack of conformity which exists at the time of delivery of the product, and which becomes apparent within two years of that time. MS can maintain or introduce a longer time limit (Article 10, paragraph 3, SGD). Therefore, whenever the two-year period is referred to, the reader should bear in mind that it could be a longer period, depending on national legislation. The sellers' liability means that, in case a lack of conformity (see Articles 6, 7 and 8 SGD) becomes apparent within the first two years of delivery, the consumer is entitled to have the goods brought into conformity (i.e. repaired or replaced) by the seller at no cost and, if that is not possible, to receive a proportionate reduction of the price or to terminate the contract (Article 13 SGD).

Under Article 6, the seller is required to deliver goods to the consumer that meet certain requirements for conformity as specified in Articles 6, 7 and 8 of SGD. It is worth mentioning that the **durability of the product** is one of the criteria for assessing the conformity of goods. In order to conform, goods should 'possess the durability which is normal for goods of the

same type and which the consumer can reasonably expect given the nature of the specific goods' (Article 7(1)(d) and Recital 32). This criterion could affect possibility (not a right) to repair even beyond the legal guarantee for a reasonable price. For example, the obligation to provide spare parts for seven to ten years in some ESPR is in line with this idea and also shows that the lifetime of certain products is expected to be much longer. The responsibility for the application of the legal guarantee is always on the sellers and the Directive ensures that sellers guarantee that goods are in conformity with the contract for a minimum period of two years after the delivery of goods and that repair or replacement are free of charge.

Within the framework of the two-year legal guarantee, when the consumer decides that repairs or replacements are to be carried out, the SGD requires that repairs are free of charge; within a reasonable period of time from the moment the seller has been informed by the consumer about the lack of conformity; and without any significant inconvenience to the consumer, taking into account the nature of the goods and the purpose for which the consumer required the goods. However, the SGD does not impose similar requirements outside the legal guarantee period to ensure that consumers have access to a repair service for a reasonable price even after the expiration of the legal guarantee.

Commercial guarantees

The SGD gives sellers the possibility to provide commercial guarantees or not and there are differences across MS regarding their conditions. In the EU MS, the duration of commercial guarantees ranges between 1 and 5 years (2 years in most cases), with expensive products often having a longer commercial guarantee.⁴⁰ The results of our survey with businesses shows that the average duration of commercial guarantees is 22.521 months. Moreover, in some countries commercial guarantees are offered against payment, while in others they are offered free of charge. Other differences between MS can be seen also in the duration of the contract, depreciation in value or benefit of a commercial guarantee.⁴¹

Commercial guarantees are a voluntary service offered by the seller and/or the producer and sometimes by a third party. These guarantees do not replace the consumer's rights under the EU legal guarantee but they are rather an additional service which upgrades consumers' rights (ECC, 2020). On average, 22% of consumers surveyed in 2015 had bought paid-for commercial guarantees in the last three years and among those 34% made use of the commercial guarantees when a problem occurred with the product (Ipsos et al., 2015).⁴² A more recent study shows that the number of commercial guarantees acquired has increased over the years, whereby in 2020 56% of consumers surveyed had purchased a commercial guarantee, most often for household products (40.5%), electronic devices (36.6%), and for vehicles (12.5%). Despite this increase, consumers are not fully satisfied with the additional protection due to numerous exclusions, inefficiencies and cost-benefit calculations (e.g. guarantee too expensive for the service offered). Furthermore, many

⁴⁰ See: <https://www.evz.de/en/shopping-internet/guarantees-and-warranties.html>.

⁴¹ Ibid.

⁴² Results are based on a consumer survey (N=1,144) carried out in eight countries (Czechia, France, Germany, Italy, Poland, Romania, Sweden, and the United Kingdom).

consumers suspect planned obsolescence on their products and are dissatisfied that the commercial guarantee is not aligned with the expected lifetime of products (ECC, 2020).

The use of commercial guarantees is even less of a standard practice for second-hand and refurbished goods. Sold through various channels (e.g. marketplaces, social media groups, direct exchanges, specialised stores, or websites), it is generally hard to track the sellers of second-hand goods in case issues occur. Commercial guarantees for second-hand goods are more common in the sale of used cars (e.g. Car Selection in Belgium⁴³). Some marketplaces offer some sort of minimum protection but not commercial guarantees per se (e.g. Vestiaire Collective⁴⁴ allows users to resell the product on the platform free of charge if they are not satisfied). Sale of refurbished goods is mostly popular in the field of electronics and some sellers do offer commercial guarantees on top of the legal protection. For instance, Cdiscount⁴⁵ proposes commercial guarantees which extend the guarantee to three or four years.

The proposal for a Directive on ECGT, adopted by the Commission in March 2022, sets out to amend the Consumer Rights Directive to ensure that consumers are provided with better information on the existence of commercial guarantees of durability of more than two years that cover the entire product. The proposal will ensure that when such a guarantee is made available by the producer, the seller must inform the consumer of this at the point of sale. It will also ensure that in the case of energy-using goods, the consumer is informed in case no such guarantee is made available.

Information to the consumer on reparability of the product:

The lack of information on the reparability of the product, including the availability of repair parts or the repair infrastructure, jeopardises the choice of the consumer and their capacity to get the products repaired within a reasonable time frame and at a reasonable price.

Articles 5 and 6 of the Consumer Rights Directive 2011/83/EU⁴⁶, as amended in 2015 and 2019, impose that the seller provides to the consumer, in a clear and comprehensible manner, information on the main characteristics of the goods or services and on the existence of the two-year guarantee of conformity of goods, digital content and digital services required under the Sale of Goods Directive. The information on the characteristics of the product and the attached services/conditions to be made available to consumers strengthens their ability to make an informed decision about their choice of products, including the guarantee associated to the products they choose (e.g. commercial guarantee). However, the scope of 'main characteristics' of the product is not defined in the

⁴³ <https://www.carselection.be/en/>.

⁴⁴ <https://us.vestiairecollective.com/>.

⁴⁵ <https://www.cdiscount.com/>.

⁴⁶ Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, as amended by Directive 2015/2302 on package travel and linked travel arrangements adopted in November 2015 and applicable from July 2018, and by Directive 2019/2161 as regards the better enforcement and modernisation of Union consumer protection rules adopted in November 2019 and applicable from 28 May 2022.

Directive, as the extent of the information to be provided varies significantly across products. It is not obvious whether currently information on the reparability of products is considered as part of the main characteristics of the product.

In this regard, the proposal for a Directive on ECGT sets out to amend the Consumer Rights Directive to ensure, among other things, that consumers are provided with better information on reparability at the point of sale. Such information should take the form of a reparability score when such a score is established in accordance with EU law. When no such score exists, consumers should be provided with other information relevant to reparability, such as the availability of spare parts and of a repair manual.

Lack of incentives to repair instead of replacing defective products within the legal guarantee period for both sellers and consumers:

Within the framework of the SGD described above, the seller has full liability in the case of a lack of conformity within the first two years of delivery (or longer in some MS). The consumer is entitled to have the goods brought into conformity (i.e. repaired or replaced) by the seller at no cost (Article 13 SGD).

While consumers have the right to request for the goods to be repaired or replaced, for a reduction of the price or for the contract to be terminated⁴⁷, the Directive 2019/771 applies a hierarchy of remedies in which consumers first have the choice between repair or replacement of the product and are entitled to a reduction of the price or the termination of the contract only if the first two remedies cannot be granted. The fact that there is no hierarchy between repair and replacement – i.e. consumers are normally free to choose between the two– might reduce the impact of the guarantee in terms of changing consumers' behaviour towards repair.

3.2.3. Psychological drivers

Based on the literature review and expert interviews, four main psychological drivers were identified. They are presented and described below:

- **Consumer preferences for new goods:** The so-called 'throw-away culture' has been a result of a growing consumerist culture that has been fuelled by economic growth (McCollough, 2009), which built the conviction that consumption is essentially fulfilling and morally desirable (Singh & Giacosa, 2019). Consumerist culture can also partly explain the concept of psychological obsolescence, the disposal and replacement of products that are still functional for psychological reasons (e.g. not liking the product anymore). For example, Makov and Fitzpatrick found through the analysis of 3.5 million iPhone benchmarking test scores that the objective performance of devices remains very stable over time, contrary to common wisdom (Makov & Fitzpatrick, 2021). Their findings indicate that perceived obsolescence and mental depreciation play a critical role in determining smartphone lifespans. They further explain that repair cannot make an older model more fashionable. Hence,

⁴⁷ European Commission – European Commission. (n.d.). Consumer sales and guarantees. Retrieved December 9, 2021, from https://ec.europa.eu/info/law/law-topic/consumer-protection-law/consumer-contract-law/consumer-sales-and-guarantees_en.

consumerism explains the dimensions of consumption that extend beyond the immediate utility of consumption choice to the social and interactional value that the choice can provide to individuals. Moreover, as production techniques are improving and new products become cheaper, the choice to repair or to buy a second-hand product becomes less and less desirable (see product-specific assessments in Annex 2).

Consumer preferences for new goods are also confirmed by the results of the consumer survey, which showed that the second most important reason for not having a product repaired is consumers wanting a new product (between 16% for cars and 27% for mobile phones/smartphones). When asked about their attitudes towards used and repaired products, consumers had mixed opinions, with a majority expressing rather negative sentiments. In the survey, 68% of consumers agree with the statement 'In general, I prefer to buy new products and hardly ever consider buying products that are second-hand or refurbished'. This sentiment is stronger the older the consumers are. Among those aged 18-24, 58% agree with this statement, while 76% among those aged 65 and older express this view.

Similarly, the survey showed that large groups of consumers have a potentially negative attitude towards repaired or refurbished products. A majority of 59% agree with the statement 'A refurbished product can never be as good as a new product', while 35% disagree. The negative view is again stronger among older age groups and slightly stronger among men than among women.

While this type of psychological obsolescence, style, cosmetic or aesthetic obsolescence (European Environment Agency, 2018) is an effect of consumer behaviour, it is also supported by producers and sellers. To stimulate the current dominating business model where profit comes from making and selling the largest number of products possible, producers can e.g. frequently change the model styles to make it psychologically less attractive to use old models. As discussed before for the product-specific drivers, products with strong temporal identities can become obsolete very quickly not because of the failure of their functional side but because of their design and of the emotions they produce in people (Hatta, 2020; Hernandez et al., 2020b).

According to McCollough (2009), there is a significantly negative correlation between the amount of yearly advertising encouraging consumers to buy new products and employment levels for television service technicians, indicating a decline in demand for repair services. In a similar vein, Bayus (1988) found that an increase in advertising expenditures can encourage households to replace their television sets earlier - despite the fact that the televisions were still functioning. In a study by Laitala et al. (2021), more than 20% of the respondents chose to repair their mobile phones because the item was fairly new (22%). Yet, when asked about the reason why they decided to not repair their defective goods, 38% of respondents believed that their mobile phone was too old and 49% that their household appliances were too old. The results of this study also question when a product can be considered old, as consumers were not provided a definition.

As many circular economy (CE) practices contradict well-established subjective norms of possession and ownership, consumers are hesitant towards them (Behrendt

et al., 2003). This suggests that it might be difficult for consumers to accept the philosophy and practice of a circular economy in general.

If defects occur outside the legal guarantee period, we expect consumerist culture to play an even larger role simply because of the higher average age of the items. For example, consumers tend to replace their smartphones every two years (Prakash et al., 2019), which means that, after the liability period has run out, consumers are very likely to buy a new model.

- **Lack of trust in repair:** Outside of the legal guarantee, consumers can not only choose if they want their item repaired, but also decide which service they want to use. However, studies investigating different repair options and identifying reasons for consumer choices are rare.

The level of trust towards the quality of the repair services and repair efficiency is a key driver behind the choice of service (European Commission, 2018a; Scott & Weaver, 2015). There are some indications in the literature that consumers put more trust into producers than into third-party repair services. Cole & Gnanapragasam (2017) find that 45% of the study's participants cannot name a commercial repairer that they trust. Wang et al. (2018) find that producers are being trusted to offer a high-quality solution and, in the case of damage, to solve any problem.

The results of the consumer survey show that trust in the quality of repair is the most important factor (together with the price) when deciding to repair or to not repair (8.2 out of 10). When asked about their attitudes towards repaired products, 57% of consumers think that 'There are usually additional quality issues with products that have been repaired or refurbished', while 35% disagree with this statement. Consumers within an older age bracket are more likely to think that there are usually additional quality issues than those from younger age groups.

- The same consumer survey results also show that, in general, between 19% (for clothing) and 36% (for laptops) of consumers engage in repair, while cars are repaired by 63% of the consumers surveyed. Among these consumers, satisfaction with the quality of the repair is rather high, with only a few consumers being dissatisfied with the quality of the repair (up to 20% depending on the product). This shows that there may be a distorted perception regarding repair and that incentives to make consumers repair more are probably needed.
- **Limited consumer acceptance for second-hand and refurbished goods:** Although second-hand consumption has experienced growing popularity and destigmatisation since the 2000s (Ferraro et al., 2016), research usually finds many consumers are not willing to buy second-hand or refurbished goods (e.g. Borusiak et al., 2020). According to the survey of European Commission (2018a), only a limited share of consumers had already purchased second-hand products. Similarly, Pérez-Belis et al. (2017) found that second-hand purchases in general are not a common practice, as only 0.75% of their participants had experiences with second-hand purchases. The consumer survey carried out under this study shows that uptake of second-hand/refurbished goods has increased compared with previous years, although behaviour differs across product types (e.g. 9% for fridges, 16% for cars, 25% for clothing).

Among the replies provided by consumers who did not purchase a used product in the last 12 months as a reason of such behaviour, the most mentioned after 'I had no need to purchase such a product' was 'I like to have products that are new'. This reason was frequently mentioned regarding shoes and clothing (31% and 30%, respectively), but also smartphones (28%), televisions (27%), refrigerators and laptops (both 24%). The third most mentioned reason for not having bought a used product was 'I don't trust refurbished or second-hand products', mentioned by 20% in regard to smartphones, 18% for televisions, 17% for laptops, 15% for shoes and 17% for clothing.

It should be noted that the consumer survey results show that most consumers understand the difference between refurbished and second-hand goods (with only 21% of consumers not seeing a difference between the two). In general, consumers' expectations and perceptions (on quality, durability, reparability, or hygiene, for example) play a decisive role for a potential consumer bias towards purchasing second-hand or refurbished goods.

The main factors influencing consumers' decisions to buy second-hand and refurbished goods are summarised in the following sections.

- **Price/Willingness to pay (WTP):** While there is ample evidence that second-hand and refurbished products provide a substantial value for consumers, it is often found that the willingness to pay for those products is quite low and consumers are unwilling to buy second-hand and/or refurbished goods. Bovea et al. (2017), for example, show that consumers often believe that a second-hand product costs more or less the same as a new product. Harms and Linton (2016) investigate the WTP for various products with and without refurbished components and find that the overall WTP for products with refurbished components is significantly lower. Pretner et al. (2021) experimentally examine consumers' WTP for circular products. Their results indicate that the WTP for those products is lower than for the conventional version of the same product. However, when consumers are provided with information about the environmental virtues of the product, and especially when that information is verified by a third-party, consumers' WTP increases significantly.

The results of the consumer survey carried out for this study show that price is the most important reason when deciding to buy a used product rather than a new one (81% of consumers think it's rather or very important).

- **Perceived quality:** Consumers usually use the price of a refurbished or second-hand product as an indication of its quality. Consumers are often concerned that refurbished or second-hand goods are generally of lower quality (Esmailian et al., 2021; Hur, 2020; Muranko et al., 2019) or demonstrate weaker performance (Smol et al., 2018). One reason for this perception is that especially refurbished goods usually lack proper standards (Grafström & Aasma, 2021). Lee and Kwak (2020) find evidence that consumers start doubting the quality of a refurbished product at a certain (low) price. Specifically, at 34-49% of the new-product price consumers consider the product as too low-quality and refrain from buying it.

Only 37% of the consumers surveyed under this study consider that refurbished goods are often of higher quality than second-hand goods. Moreover, quality of used products is the second most important factors they consider when buying used products (82% think it's rather or very important).

- **Hygiene:** Although hygiene is sometimes treated as part of a product's perceived quality, it itself can be stated as an influencing factor. However, its importance strongly depends on the product category under review. Research shows that second-hand purchases are sometimes prevented by concerns regarding cleanliness and the hygiene of appliances (Hur, 2020; Pérez-Belis et al., 2017). Similarly, Wallner et al. (2022) explore strategies to improve consumer adoption of refurbished products by reducing contamination. They find that consumers believe that refurbished and second-hand products are contaminated with traces of prior use, which can be indicated by the appearance (e.g. scratches) or functionality (e.g. lower battery capacity) of those products. Abbey et al. (2015) or Camacho-Otero et al (2020) even call it 'disgust', which is caused by physical contact and, thus, perceived contamination, by a previous owner. Regarding second-hand clothes, Pretner et al. (2021) even find that the general negative perception of second-hand goods is strongly linked to feelings of contamination and poor hygiene. 'Hygiene' is often interchangeably used with the consumer bias towards second-hand and refurbished goods as such. The consumer survey echoes this scepticism towards the cleanliness of used products. When asked about the characteristics of refurbished products, only 33% considered that these products have been cleaned and sanitised before they are sold.
- **Environmental awareness:** Although concerns about ecological problems are growing and despite consumers showing an increasing environmental sensitivity, numerous empirical studies have demonstrated that pro-environmental attitudes often do not directly translate into actual environment-friendly buying behaviour (see Kostadinova, 2016 for a literature overview). For example, Lakatos et al. (2016) show that consumption behaviour in Romania is not in line with consumers' general attitudes regarding the environment, in the sense that people are not more likely to buy second-hand or refurbished products if they are environmentally conscious. The same holds true for a study by Calvo-Porràl and Lévy-Mangin (2020), who find no significant influence for product environmental benefits on consumers' acceptance of second-hand or refurbished products. However, a growing body of research shows that the opposite is more likely to be true. Guiot and Roux (2010), for example, find strong support for ethical and ecological considerations as motives for second-hand purchases. Similarly, Hristova (2019) shows that the reduction of pollution and saving resources is among the main factors influencing consumers' buying behaviour towards second-hand products.

Borusiak et al. (2020) examine consumers' intention to buy second-hand products in an online survey conducted in Poland. They find evidence that the attitude towards the positive impact of second-hand buying on sustainable consumption is positively related to second-hand product purchase intentions. Hur (2020) investigates the enabling and disabling factors that influence the consumption of second-hand clothing by help of two semi-qualitative studies.

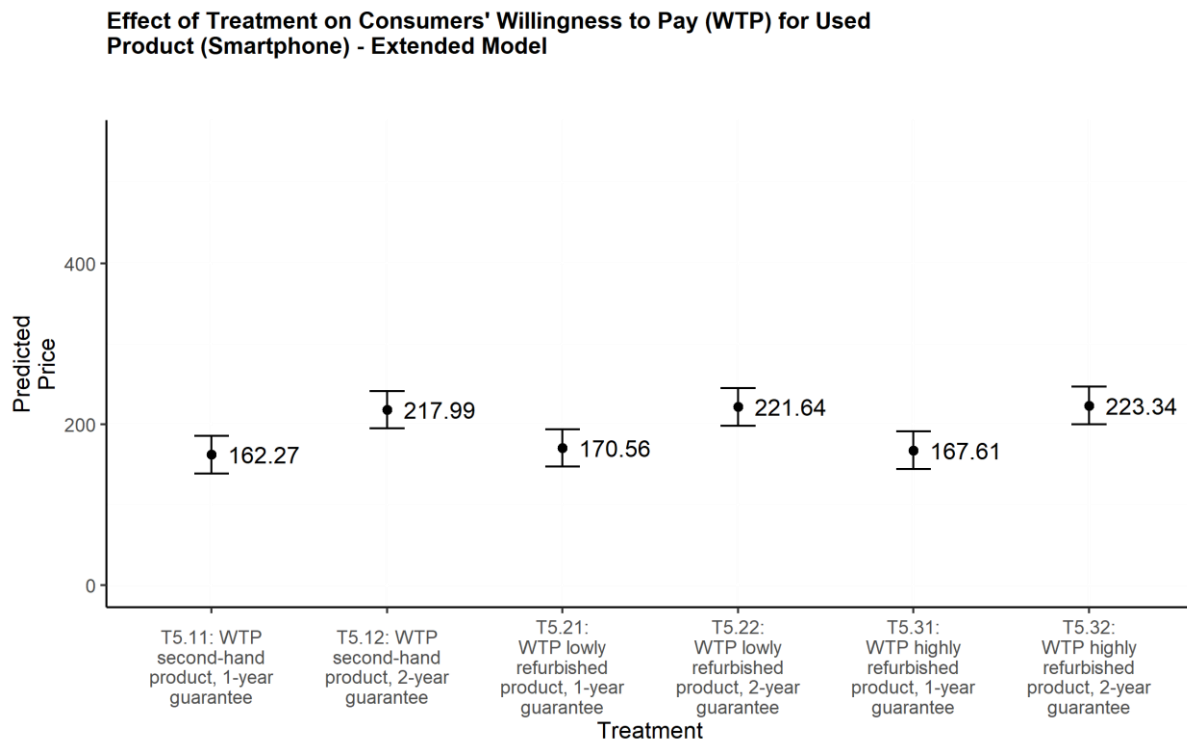
The author finds that environmental benefits belong to the five most important drivers of second-hand consumption. Liu et al. (2021) conduct experimental surveys to investigate whether consumers' psychological distance from environmental pollution influences their willingness to participate in second-hand online transactions. Their findings indicate that consumers who are psychologically closer to environmental pollution are more willing to participate in second-hand online transactions.

The consumer survey that was carried out as part of this study provides some support on this point. Based on answers to questions about their general attitudes and behaviour with regard to sustainable consumption, respondents were classified into four groups, 'actives', 'engaged', 'laggards' and 'sceptics'. Only for clothes, the survey showed considerable difference in their consumer behaviour. Among 'actives', those with the highest level of engagement with sustainability issues, 32% mentioned that they had bought used clothing in the past, while among 'sceptics', those with the lowest level of engagement, it was 15%. For all other product categories, the survey did not reveal similar systematic differences.

- **Lifestyle/Image:** On the one hand, Hur (2020) found consumers' concerns about personal and social image and acceptance as one of the main barriers for second-hand consumption. On the other hand, Steffen (2017) analysed the motivation for second-hand consumption in Germany and found it to largely differ from UK or French consumers' motivation: based on the results of her study, German consumers are not primarily influenced by economic motivations when buying second-hand. Instead, the study showed a dominance of social and nostalgic motives, suggesting that consumers of second-hand products are mainly driven by lifestyle reasons. Consumers' willingness distance themselves from the consumption system and to show critique on the consumerist culture by buying second-hand is also found to be a relevant driver for second-hand purchases (Guiot and Roux , 2010).
- **Shorter or no guarantee period:** The results of the consumer survey show that not being protected or having limited protection through a legal or commercial guarantee is also a reason not to purchase a used product (ranging between 7% to 14% depending on the product). As part of this study, a behavioural experiment was conducted that tested the effects of possible policy measures related to the alignment of the guarantee period of used goods with those of new goods.⁴⁸ In particular, the experiment measured consumers' willingness to pay for used goods under the conditions of a 1-year guarantee period compared with a 2-year guarantee period. The results reveal that consumers put a considerable premium on an extended guarantee period. Among the three types of products tested, the effect is greatest for refrigerators and lowest for shoes. The results of the experiment also showed that there is effectively no difference in this effect by type of used product. The willingness to pay increases similarly for second-hand products, lowly refurbished products, and highly refurbished products.

⁴⁸ The full results of the experiment are documented in the Annex 1 attached to the report.

Figure 14 - Effect of an extended guarantee period on consumers' willingness to pay for used products



- Insufficient knowledge to make an informed repair or purchasing decision:**
 Another identified driver to premature disposal is the consumers' lack of information regarding the durability and reparability of products (European Commission, 2018; Hatta, 2020). In a behavioural experiment carried out for the European Commission (2018), the provision of such information was found to be highly effective at shifting purchasing decisions towards products with greater durability and reparability.

Consumers often lack crucial information on the reparability and maintenance of products as well as on the availability and price of spare parts and are thus not able to reward manufacturers who produce long-lasting and easily repairable goods (European Commission, 2018b; Hernandez et al., 2020a). A study conducted by Van den Berge et al. (2021) finds that consumers lack the ability to make well-informed product lifetime estimations. One reason emphasised by the study is that the information about the quality and robustness of used materials and components is often not communicated by the manufacturer. Svensson et al. (2018) investigate the barriers to accessing repair services for consumer electronics. They point to institutional barriers according to which consumers are often restricted to the repair services provided by the Original Equipment Manufacturer (OEM)⁴⁹ and their authorised network and are provided with partly misleading information that legal

⁴⁹ An OEM is a company that makes parts and products for other companies which sell them under their own name or use them in their own products.

guarantees would be void if products were repaired by non-authorised providers (incl. DIY).

As part of the assignment, we conducted a behavioural experiment related to the potential effects of the introduction of a 'Right to Repair' for consumers (see Annex 1). The aim of the experiment was to measure the potential effects of introducing a 'Right to Repair' on the behaviour of consumers. The experiment showed that missing information is a relevant factor that prevents consumers from commissioning a repair. Missing information on the cost of the repair has the largest effect on consumers' decision. Furthermore, the second part of the experiment illustrated the inhibiting effect of the costs for the diagnosis of the repair. The higher the costs for the assessment of the repair costs, the more likely consumers are to reject the option of repair.

3.2.4. Other drivers

It should be noted that there is a multitude of other drivers that influence the consumption lifetime of products in addition to those presented above, but they do not fall within the remit of this study. Some of these drivers are described in the subsequent paragraphs.

Another economic driver mentioned during the initial interviews is a potential link between the economic stability of a certain period and the development in product lifetime. Despite a lack of literature on this subject, Bakker et al. (2014) suggest a linkage between the decrease of product lifespans between the years 2000 and 2005 in the Netherlands and the economic 'boom' experienced in the country at that time.

Furthermore, technical aspects can lead to premature disposal of products. One example is obsolescence through software in the case of electronic devices. This type of obsolescence occurs when a product no longer works properly due to a lack of software interoperability (Bachér et al., 2020; Hatta, 2020; Soto Pineda & Prada Salmoral, 2017). This issue is gaining importance today since hardware and software are intimately related and the role of the software is becoming more important. This is the case, for example, when old laptops are not able to fulfil the minimum requirements of new operating systems and new operating systems and programmes slow down the device and prevent an effective operation.

There are also other regulatory aspects that may pose barriers to product repair, such as the Intellectual Property Rights (IPRs), like copyrights and patents. Some types of repairs are undermined by the fact that copyright and patent laws are meant to preventively hinder reconstruction of protected work. For instance, in the case of patent law, repair activities deemed to be 'reconstruction' or 'modification' are considered to directly infringe patents in the US and the EU alike (Hatta, 2020; Svensson-Hoglund et al., 2021). Furthermore, supply of non-patented spares used to repair an article protected by a combination patent might be indirectly infringing IPRs. IPRs thereby lead to wasteful behaviours as the protection deters extensive repairs. According to Svensson-Hoglund et al. (2021), this is a consequence of IPRs being property rights and being considered of greater importance than interests related to the circular economy, which are thus easily overridden. This is also seen in copyright law, where a so-called End-User License Agreement (EULA) usually accompanies the purchase of a software-enabled product and hence regulates permissible use of the software. Here, clauses sometimes forbid unauthorised repair, disassembly, and/or use of non-OEM parts (Hanley et al., 2020; Svensson-Hoglund et al., 2021; Svensson et al., 2018).

Another driver relates to taxation. Although there are incentives for producers to make repairable products or incentives to repair defective products, these are not harmonised across the EU MS. In Ireland, Luxembourg, Malta, Netherlands, Poland, Slovenia, Finland, Austria, and Sweden, the governments implemented VAT reduction on minor repair services (including mending and alteration) of bicycles, shoes, and leather goods (RREUSE, 2017). In Austria it means that VAT for these types of repairs will be reduced from 20% to 10% to incentivise repairing instead of throwing away products (Piringer & Schanda, 2020).

While some countries applied a tax-reduction strategy to incentivise the use of repair services, other countries like France decided to enhance the consumers' knowledge and awareness. Since January 2021, consumers have access, in store and online, to a reparability score (*Indice de réparabilité*)⁵⁰. This score is accessible for washing machines, smartphones, laptops, TVs, and electric lawn mowers. This score out of 10 allows consumers to compare how easy repairing a product is and is based on different criteria such as the ease of disassembly, the availability of spare parts and repair manuals, and the price of key spare parts (Mikolajczak, 2020). The aim of this governmental initiative is to tackle obsolescence and to avoid wasting resources such as rare earth elements used to make smartphones. It is mandatory for manufacturers to publish the detail of their scoring, thus making it easier for consumers to check the reliability of the information and the reparability of the products.

Other drivers which need to be taken into account in regards to the problem of premature disposal concern the awareness of consumers. For instance, consumers' awareness regarding the impact that their consumption habits have on the environment counts as a significant motivation favouring the transition towards the CE. This awareness carries with it negative emotions associated with the impact of some consumption habits on the environment that consumers are motivated to avoid, such as disposing of a repairable product (Terzioğlu, 2021). It also carries a positive emotional motivator associated with pro-environmental practices such as repairing a product instead of replacing it or purchasing a refurbished product. An experiment conducted in another study revealed knowledge about the respective environmental impact of remanufactured products can play a role in determining consumer perceived value and purchase intentions (Wang & Hazen, 2016).

Concerning consumerist culture, environmental concerns are also dialectic/antagonistic cognitive and psychological factors. A study found that the perceived sustainability of participating in a peer-to-peer sharing platform for second-hand clothing influenced consumers' tendency to distance themselves from the consumption system and had a direct influence on the attitude towards buying second-hand goods (Ek Styvén & Mariani, 2020). Environmentally aware consumers additionally have a lot of scepticism and frustration towards false claims and the unwillingness of market players to meet environmental demands, as in-depth interviews with Brazilian and Portuguese green consumers have shown (Lemke & Luzio, 2014).

A German study found that more expensive appliances had longer lifetimes and that the disposal of perfectly functional devices is affected by consumers' expectations of the lifespan (Zhilyaev et al., 2021).

⁵⁰ Ministère de la Transition écologique. (N.-D.). *Indice de réparabilité*. Retrieved December 9, 2021, from <https://www.ecologie.gouv.fr/indice-reparabilite>.

3.3. Scale of the problem and potential market failure

When analysing the scale of the problem, attention needs to be drawn to the two problem aspects identified within this study (see chapter -177732352). These are:

- Goods are not used for as long as they could because they are not repaired; and
- Limited use of second-hand goods by consumers.

As regards the first problem aspect and for understanding the scale of the problem, it is important to note that the repair of goods has the potential to be a powerful lever in the transition to a circular economy. However, many products that could be given a second life are being disposed of instead of repaired. In this regard, two factors must be considered. The first factor involves the propensity of consumers to have products repaired or replaced, whereas the second factor refers to the fate of goods within the businesses once they are brought back by consumers because of a defect.

The results of our consumer survey show that consumers tend to replace more than repair when a product is defective. Indeed, 65% of consumers would always or probably have a product replaced compared with only 31% who would probably or always have it repaired.⁵¹ However, when pricier products become defective (such as cars or laptops), consumers prefer to repair (data is presented in more detail in chapter 4). This is also supported by findings of other studies which show that low-priced products such as hairdryers (5%), kettles (5%), hand mixers (8%) and toasters (7%) are least likely to be repaired (Wertgarantie, 2021)⁵². Furthermore, a recent study on sustainable consumption revealed that a substantial share of EU consumers have not repaired products after they broke. On average in the EU, 36% of the respondents have not repaired broken products, but higher shares can be observed at national level, for example, 56% in the Netherlands (European Commission, 2018). National data from Germany indicates that on average 22% of electronic and electrical devices are repaired. If consumers decide against repair, 84% of broken electronic and electrical devices are disposed of, while in the remaining 16% of cases consumers decide to either pass on the devices free of charge or sell them (Wertgarantie, 2021), demonstrating that repair could considerably contribute to decreasing the amounts of electrical and electronic waste. Overall, repair rates are lower in Germany (23%) than in East Asia (66%) or China (64%) (Türkeli et al., 2019).

In order to analyse the extent to which consumers are willing to repair their products, an analysis of Google search trends⁵³ across the 12 MS was covered in our study, over the

⁵¹ As part of the consumer survey conducted for this study, consumers were asked about the propensity to have a product repaired or replaced assuming that a defect occurred within the legal guarantee period.

⁵² Data refers to Germany.

⁵³ The data was mined from Google search history, using a tool (SE Ranking) that allowed us to identify the average search volume of specific keywords in the 12 countries covered by the study. The average search volume is calculated from December 2020 to November 2021. The search volume is a SEO metric that can help to understand how often a specific search term is being looked for in this case on Google.

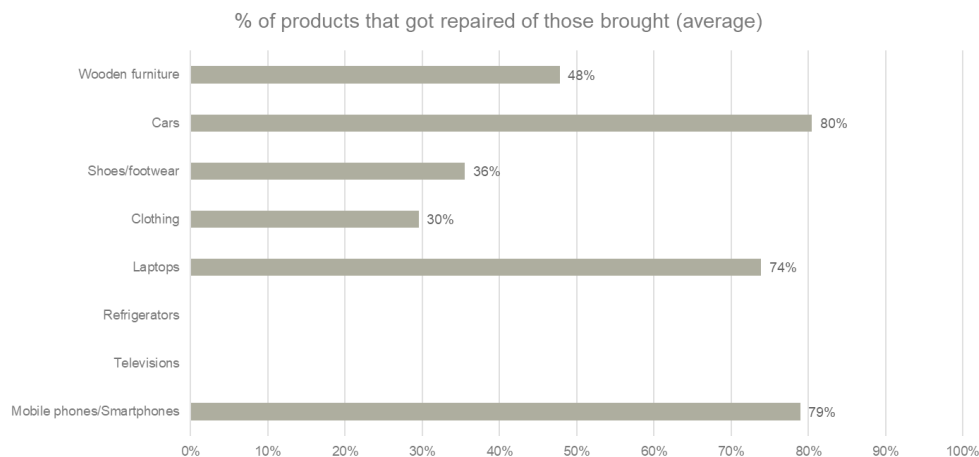
period of one year.⁵⁴ The results show that a substantial volume of people across the 12 MS were searching online for solutions to get their goods repaired (see Annex 1 for further details).

Concerning the second point, it is important to note that it is left to the sellers to decide what to do with defective consumer goods after replacement. In this context, the results of the business survey reveal that only some product types enjoy high repair rates when brought back by consumers, such as cars, laptops or mobile phones, while other product types, like clothing as well as shoes and footwear, are repaired only in 30-36% of cases (see Figure 15). Thus, while repair is still quite common among consumers, considerable environmental and economic impacts are caused by high replacement rates or disposal of defective products.

Figure 15 - Percentage of defective products which are repaired when brought to businesses by consumers

What % of products from the following categories that were brought got repaired last year?

Base = 135 responses – repair (all respondents)



The percentages for the categories of 'refrigerators' and 'televisions' were removed as the number of respondents was below 10.

Source: Authors based on business survey results

Table 16 gives an overview of available data which helps to understand the scale of the problem. This data includes information on the propensity of consumers to repair rather than replace products, information on the frequency of repair and the experience of consumers with repair by product category.

⁵⁴ Approximately 29,000 searches are made for 'television repair' and associated terms; Approximately 20,000 searches are made for 'refrigerators repair' and associated terms; Approximately 84,000 searches are made for 'laptop repair' and associated terms; Approximately 300,000 searches are made for 'mobile phones repair' and associated terms; Approximately 20,200 searches are made for 'clothing repair' and associated terms; Approximately 12,400 searches are made for 'shoes repair' and associated terms; Approximately 24,500 searches are made for 'car repair' and associated terms; Approximately 500 searches are made for 'wooden furniture repair' and associated terms.

Table 16 - Overview of available data providing an indication about the scale of the problem

	Propensity of consumers to always or probably have a product replaced (based on consumer survey)	Propensity of consumers to always or probably have a product repaired (based on consumer survey)	Frequency of repair (based on Wertgarantie (2021))	Share of consumers who have never had the product repaired (based on European Commission, (2018)).	Experience of buying used goods in the last 12 months (based on consumer survey)
Mobile phone/smartphone	68%	29%	27%	37%	15%
Television	67%	30%	19%	37%	11%
Refrigerator	60%	36%	20%	/	9%
Laptop	61%	36%	38%	/	14%
Clothing	79%	16%	/	39%*	25%
Shoes/Footwear	78%	18%	/	/	13%
Car	45%	52%	/	/	16%
Wooden furniture	56%	39%	/	/	12%

* The product category assessed in the study of the European Commission (2018) was coats or jackets.

Regarding the use of second-hand goods, the results of the consumer survey suggest few consumers purchase second-hand goods (see Table 16). The highest share can be observed for clothes, while only a small share of consumers (9%) stated they have bought used refrigerators. In this context, lack of trust in refurbished or second-hand products is one of the main factors when deciding not to buy a used product (values vary depending on the product, 11-20%).

Table 16 includes data on the propensity of consumers to always or probably have a product replaced/repaired based on the consumer survey. The analysis of this data at the MS level shows that the propensity of consumers to repair or replace varies between MS. The data shows that across all three selected product categories, the share of consumers who would always or probably have a product repaired in Hungary, the Netherlands and France is higher than in Italy, Spain, and Greece (see Table 17). For instance, in the case of mobile phones/smartphones, the share of consumers who would always or probably have a product repaired is significantly lower in Spain (19%) than in the Netherlands (36%).

Table 17 - Propensity of consumers to always or probably have a product replaced/repaired for selected product categories and MS based on results of the consumer survey

Country	Product category	Share of consumers who would always have a product replaced/probably have it replaced (number of respondents)	Share of consumers who would always have a product repaired/probably have it repaired (number of respondents)
Spain	Mobile phones/smartphone	80% (194)	19% (45)
	Refrigerators	71% (179)	26% (66)
	Cars	63% (128)	33% (67)
Greece	Mobile phones/smartphone	76% (216)	23% (66)
	Refrigerators	67% (174)	31% (80)
	Cars	59% (113)	41% (78)
Germany	Mobile phones/smartphone	69% (202)	26% (75)

Country	Product category	Share of consumers who would always have a product replaced/probably have it replaced (number of respondents)	Share of consumers who would always have a product repaired/probably have it repaired (number of respondents)
Italy	Refrigerators	60% (167)	37% (102)
	Cars	38% (83)	58% (126)
	Mobile phones/smartphone	74% (205)	23% (64)
Netherlands	Refrigerators	60% (155)	37% (95)
	Cars	53% (116)	44% (97)
	Mobile phones/smartphone	58% (162)	36% (101)
France	Refrigerators	49% (124)	47% (118)
	Cars	34% (75)	63% (141)
	Mobile phones/smartphone	64% (177)	31% (85)
Hungary	Refrigerators	53% (136)	42% (108)
	Cars	41% (100)	55% (134)
	Mobile phones/smartphone	62% (181)	35% (106)
Poland	Refrigerators	52% (149)	47% (133)
	Cars	36% (63)	62% (106)
	Mobile phones/smartphone	68% (201)	26% (78)
Romania	Refrigerators	64% (160)	30% (75)
	Cars	46% (89)	46% (89)
	Mobile phones/smartphone	68% (191)	30% (83)
Sweden	Refrigerators	68% (188)	31% (87)
	Cars	40% (74)	59% (109)
	Mobile phones/smartphone	63% (185)	31% (91)
Hungary	Refrigerators	64% (154)	31% (74)
	Cars	41% (81)	56% (112)

In addition, as part of the consumer survey carried out for this study, consumers who experienced a defect were asked what they did when the defect occurred. The results at the MS level for selected product categories are shown in Table 18 below.

Table 18 - Share of consumers who replaced or repaired their products in the event of a defect in different MS for selected product categories based on results of this study's consumer survey

Product category	Share of consumers ...	France	Germany	Greece	Hungary	Italy	Netherlands	Poland	Romania	Spain	Sweden
Mobile phone/smartphone	... who replaced the product with a new one	35%	47%	33%	43%	33%	46%	30%	40%	41%	39%
	... who had the products repaired/ repaired it themselves	34%	33%	37%	39%	41%	21%	45%	36%	36%	30%
Refrigerator	... who replaced the product with a new one	44%	49%	28%	46%	30%	48%	41%	34%	43%	36%
	... who had the products repaired/	38%	27%	55%	36%	52%	33%	38%	51%	39%	30%

Product category	Share of consumers	France	Germany	Greece	Hungary	Italy	Netherlands	Poland	Romania	Spain	Sweden
	... repaired it themselves										
	... who replaced the product with a new one	14%	14%	7%	13%	15%	18%	17%	18%	11%	16%
Cars	... who had the products repaired/ repaired it themselves	68%	70%	77%	76%	72%	70%	66%	70%	80%	66%

In the case of mobile phones/smartphones, depending on the respective MS, the share of consumers who replaced the product with a new one ranges between 30% in Poland and 47% in Germany. Data indicates high replacement rates for Germany (47%), the Netherlands (46%) and Spain (41%), whereas highest repair rates can be observed in Poland (45%), Italy (41%) and Hungary (39%). As regards refrigerators, data indicates high repair rates in Greece (55%), Italy (52%) and Romania (51%), while Germany (27%) and the Netherlands (33%) seem to be characterised by rather low repair rates. Thus, consumer survey results indicate that the repair behaviour of consumers varies between MS, suggesting that the scale of the problem differs as well. This is also supported by the findings from a study of the European Commission (2018), which shows that repair behaviour differs by country. Accordingly, for the Netherlands, 56% of participants indicated that they did not repair, while in Romania not repairing a product is only an option for 25% of participants.

Interestingly, the share of consumers who had their mobile phones/smartphones repaired or repaired them themselves is lowest in the Netherlands (21%), although the share of consumers who would always have their mobile phone/smartphone repaired or probably have it repaired (36%, see Table 17) is higher in the Netherlands than in other MS. Hence, based on the responses to the consumer survey, it can be concluded that there seem to be inconsistencies between the propensity to have a product repaired and the actual repair rate. These inconsistencies cannot be explained on the basis of the consumer survey results.

In addition, respondents were asked about the perception of the repair market for each of the product categories assessed⁵⁵. The results at the MS level are displayed in Table 19 below for selected product categories.

Table 19 - Perception of the repair market at the MS level based on results of the consumer survey

Product category	Share of consumers	France	Germany	Greece	Hungary	Italy	Netherlands	Poland	Romania	Spain	Sweden
	More likely to have a defective product repaired than replaced	23%	27%	27%	17%	30%	19%	26%	31%	29%	19%
Mobile phone/smartphone	Less likely to have a	18%	22%	29%	29%	32%	30%	24%	25%	21%	31%

⁵⁵ For this purpose, consumers were asked how likely they are to have a product repaired rather than replaced if the market for repair services continues to be as it is today. Shares of consumers stating that they are 'equally likely to have a defective product repaired rather than replaced' are not displayed.

Product category	Share of consumers	France	Germany	Greece	Hungary	Italy	Netherlands	Poland	Romania	Spain	Sweden
	defective product repaired than replaced										
Refrigerator	More likely to have a defective product repaired than replaced	25%	19%	27%	27%	26%	21%	22%	38%	26%	19%
	Less likely to have a defective product repaired than replaced	37%	21%	21%	34%	35%	25%	22%	26%	28%	37%
Cars	More likely to have a defective product repaired than replaced	40%	40%	50%	46%	48%	40%	49%	44%	46%	26%
	Less likely to have a defective product repaired than replaced	12%	10%	15%	12%	15%	10%	9%	11%	15%	19%

In the case of mobile phones/smartphones, the results suggest that there are five MS (Sweden, Netherlands, Italy, Hungary, and Greece) in which the majority of consumers are more likely to have a defective product replaced rather than repaired if the repair market continues like it is today, with shares ranging from 29% to 32% within these MS. In the remaining five MS (Spain, Romania, Poland, Germany, and France), a majority of consumers state that they will be more likely to have a defective product repaired rather than replaced (shares ranging from 23% to 31%). When looking at refrigerators, data indicates that the overall perception of the repair market seems to be more skewed towards replacement than in the case of smartphones, since there are only two countries (Greece and Romania) where the majority of consumers are more likely to have a defective product repaired rather than replaced when the repair market continues to be like it is today. Considering all MS, between 21% and 37% of consumers state that under these conditions, they will be more likely to have a defective refrigerator replaced than repaired. As regards cars, the results of the consumer survey suggest a functional repair market. Between 26% and 50% of respondents state that they will be more likely to have a defective car repaired if the repair market continues to be like it is today. This can be taken as an indication that the scale of the problem does not only vary between MS but also between product categories.

Furthermore, the responses of the consumer survey suggest that the willingness to buy second-hand or refurbished products might vary between MS. The share of consumers who fully agree or tend to agree with the statement 'In general, I prefer to buy new products and hardly ever consider buying products that are second-hand or refurbished' in Romania (83%), Greece (78%) and Spain (75%) is significantly higher than in France (59%), Hungary (59%) and Sweden (56%).

Based on the data shown in Table 16 and the descriptions above, the following conclusions can be drawn:

- Fate of consumer goods post replacement is left to the sellers, for whom repair and re-use are not a common practice.
- Available data on mobile phones/smartphones, televisions and clothing indicates that 37-39% of consumers in the EU have never repaired these products. However, this indication should be considered with caution as data is only available for three of the eight product categories assessed.
- More generally, the available data on the analysed product categories indicates that in the EU approximately 30% of products are repaired. This suggests that more than two thirds (70%) of products are not repaired. However, as Table 19 shows, the identified repair versus non-repair ratios among product categories vary significantly. Repair for certain products such as cars is very high, while repair of other products such as clothing is relatively low. Therefore, it is important to note that the aforementioned overall shares of repair and non-repair represent an approximate estimation and need to be interpreted with due caution.
- Data suggests that only a relatively small share of consumers purchase second-hand goods (9-25% depending on the product category). This implies that a majority of consumers prefer to buy new goods. However, when interpreting these figures, it should be considered that consumers might not have had the need to purchase one of the related products within this time period (the last 12 months).
- Lack of trust in second-hand and refurbished goods lowers the willingness of consumers to purchase such products, as indicated in the consumer survey (11-20% depending on the product category). This is a lost opportunity when it comes to reducing environmental impacts due to premature disposal.

Overall, the available data from the consumer survey shows that attitudes and behaviour of the respondents towards several aspects related to the problem of premature disposal (such as the propensity to have a product repaired/replaced or the perception of the repair market) vary across MS, suggesting that the scale of the problem does not only differ between product categories but also from one MS to another. However, it was not possible to identify any regional trends. Furthermore, on the basis of the available data, it is not possible to make any concrete statements about the exact extent to which the scale of the problem varies from one MS to another.

Scale of the problem from an environmental and economic point of view

Assuming that a basic need for products exists, a certain level of environmental impact will always be associated with consumption. However, the premature disposal of products leads to a sub-optimal use of resources associated with the production of the products (i.e. resources wasted) and to CO₂ emissions and waste generated without corresponding material benefits for consumers and society (i.e. unnecessary CO₂ emissions and waste).

In order to provide a quantification of current environmental impacts, the resources, CO₂ emissions and waste volumes associated with the share of designed product lifetime, which is foregone by consumers due to premature disposal, was calculated. Annex 3 provides a detailed description of the calculations and their underlying assumptions. In this regard, it should be noted that, due to the various assumptions, the outcome of the calculations should

be considered an informed approximation of main environmental impacts when not using the full extent of a product's theoretical lifetime.

The accumulated outcome for main resources, CO2 emissions, and waste streams is presented in the table below and provides an indication of the overall magnitude of environmental impacts, assuming that the analysed product categories cover a considerable part of consumer products placed on the EU market which can be subject to repair.

Table 20 - Overview of yearly arising of environmental impacts associated with the premature disposal of products. This data represents the sample of products chosen for the purpose of this study.

Material / CO2 / Waste	Wasted volumes due to premature disposal (including cars)	Wasted volumes due to premature disposal (excluding cars)	Indicative equivalent (including cars)
Aluminium / Cast aluminium	311,145 tonnes	41,221 tonnes	Amount equal to 15.5% of aluminium produced in EU28 in 2020. ⁵⁶
Copper	1,333,555 tonnes	22,302 tonnes	Amount equal to 74% of copper produced in European mines in 2020. ⁵⁷
Plastic (includes different types of plastic)	1,188,745 tonnes	483,107 tonnes	The amount of plastic needed to manufacture 21 Mio. cars. ⁵⁸
Steel and iron	4,757,029 tonnes	430,944 tonnes	Amount equal to 2.7% of EU steel output. ⁵⁹
Wood	2,028,680 tonnes	2,028,680 tonnes	Amount equal to 12.63% of the EU28 wood pellets production in 2015. ⁶⁰
Rubber	566,821 tonnes	566,821 tonnes	Amount equal to 24.64% of the general rubber goods production of the EU in 2020. ⁶¹
Other metals	6,160 tonnes	6,160 tonnes	-
Phenyl isocyanate	70,757 tonnes	70,757 tonnes	-
Glass	223,795 tonnes	0 tonnes	Amount equal to 0.62% of the total glass production in EU28 in 2020. ⁶²
Cotton	2,704 tonnes	2,704 tonnes	Amount equal to 0.76% of the EU cotton production in 2018. ⁶³

⁵⁶ In 2020, around 2 million tonnes of aluminium were produced in EU28 (European Aluminium).

⁵⁷ In 2020, around 1.8 million tonnes of copper were produced in European mines (Statista).

⁵⁸ This number was calculated based on the baseline data. It was calculated with the simplification that 'plastic' is one plastic type. In reality, all examined products include different types of plastic.

⁵⁹ The EU is the second largest producer of steel in the world after China. Its output is over 177 million tonnes of steel a year.

⁶⁰ 16,050,000 tonnes of wood pellets were produced in EU28 in 2015 (Eurostat).

⁶¹ The EU produced an estimated 2.3 million tonnes of general rubber goods (GRG) in 2020 (Statist).

⁶² The EU28 had a total glass production of 35.85 million tonnes in 2020 (Statista).

⁶³ For 2018, the EU cotton production was estimated at 340,000 tonnes (European Commission).

Material / CO ₂ / Waste		Wasted volumes due to premature disposal (including cars)	Wasted volumes due to premature disposal (excluding cars)	Indicative equivalent (including cars)
Unnecessary resource use		10,489,392 tonnes	3,652,698 tonnes	See all rows above.
Unnecessary emissions	CO ₂	57 Mio. tonnes CO ₂ -eq	30 Mio. tonnes CO ₂ -eq	19 Mio. flights from Germany to Maldives and back (for one person). ⁶⁴
Unnecessary generated	waste	7,354,334 tonnes	4,862,667 tonnes	Weight equal to the municipal waste generation of around 14.5 Mio EU citizens. ⁶⁵ This is equal to 3.2% of the EU population.

The table below gives an overview of resources, waste and CO₂-eq. emissions that are unnecessarily produced due to not using the full absolute lifetime of a product (i.e. due to premature disposal). These 'wasted' resources can be considered the scale of the environmental problem. The numbers indicating the products sold and imported in the EU in 2019 serve as reference value to highlight the extent to which premature disposal leads to environmental impacts. For example, in 2019, around 150 million mobile phones were placed on the EU market whereas the purchase of 122 million of these phones could be avoided when using the full absolute lifetime of phones (7 years) and not only 1.80 years, which is the current average consumption lifetime.

In the table below, the 'number of products whose purchase can potentially be avoided when using the maximal lifetime of products' is expressed in the related resources, waste, and CO₂ emissions. These can be potentially saved when using the full absolute lifetime of a product. The data in the last column represents an extrapolation to the whole economy.

Table 21: Overview on the scale of the environmental problem on a yearly basis (represented year: 2019) (The colour code reflects a ranking of the potential savings among the product groups whereby red is the highest saving potential and green the lowest saving potential)

	Unit	Mobile phones	TVs	Refrigerators	Laptops	Clothing	Shoes	Cars	Wooden furniture	Total of 8 selected products (incl. Cars)	Total of 7 selected products (excl. Cars)	Extrapolation to the whole economy (Factor 5.74)
Product sold and imported in the EU in 2019	products	151,314,020	47,287,292	21,838,486	51,385,030	100,158,788	2,624,172,994	12,647,728	77,000,000	3,085,804,338	3,073,156,610	17,639,918,943
Number of products whose purchase can potentially be avoided when using the maximal lifetime of products	products	112,404,701	32,241,335	10,919,243	22,022,156	75,119,091	1,049,669,198	4,567,235	43,975,556	1,350,918,514	1,346,351,279	7,728,056,342
Potential CO ₂ savings	tonnes CO ₂ -eq	3,625,052	4,949,045	3,559,673	5,222,554	1,034,390	10,013,844	27,081,603	1,653,481	57,139,642	30,058,039	172,533,144
Potential monetisation of CO ₂ savings	€	652,509,287	890,828,099	640,741,179	940,059,761	186,190,179	1,802,491,946	4,874,688,591	297,626,560	10,285,135,602	5,410,447,011	31,055,965,844
Potential resource savings	tonnes	6,491	178,875	570,967	42,084	28,771	780,954	6,836,694	2,044,556	10,489,392	3,652,698	20,966,486
Potential monetisation of resource savings	€	62,028,430	202,749,190	563,780,738	72,122,023	43,614,966	850,188,789	15,950,658,008	27,683,867	17,772,826,011	1,822,168,003	10,459,244,338
Potential waste savings	tonnes	11,886	184,091	665,000	30,857	1,777,500	480,000	2,491,667	1,713,333	7,354,334	4,862,667	27,911,709
Potential monetization of waste	€	1,937,371	30,006,818	108,395,000	5,029,714	289,732,500	78,240,000	406,141,667	279,273,333	1,198,756,404	792,614,737	4,549,608,592

As described in chapter 3.1. Problem definition, The economic impacts assessed in this report revolve around the most important and direct monetary (or monetisable) consequences of the premature disposal of products, separately for the four main stakeholder categories: (i) manufacturers (globally and those located in the EU separately); (ii) sellers (traders); (iii) repair services; and (iv) consumers – and in addition, workers in manufacturing, trade, and repair. The consequences have been monetised, although this only serves to give a dimension to the impacts, the calculated numbers should not suggest a high degree of precision.

⁶⁴ A flight from Germany to the Maldives and back causes a climate impact of around three tonnes of CO₂ per person.

⁶⁵ 505 kg of municipal waste per capita were generated in the EU in 2020.

The natural first-round effect of premature disposal of durable consumer products is that these products cease to be available for further use, either by the original owner or by another consumer (friends and family, second-hand buyer), hence the existing consumption need will have to be satisfied by a new replacement product or being kept unsatisfied. Premature disposal also includes cases where the original owners do not wish to replace the product themselves, but by not putting it onto the second-hand market they will not enable the discarded product to satisfy a relevant consumption need.

There are some differences between the types of products covered in this regard. The given product and hence its replacement can be regarded as more or less essential for six of the eight product groups (mobile phones, refrigerators, laptop computers, televisions, cars, much of wooden furniture), while this is not necessarily the case for footwear and clothing, where consumers would normally have a number of alternatives (i.e. other clothes and shoes) readily available for a given discarded piece that they could use. In any case, when modelling the effects, it was assumed for simplicity that the unmet need will need to be satisfied at some point in time.

This results in an unmet consumer need, which will facilitate producing, importing and selling new products, increasing the economic activity of the manufacturers, importers and retailers (the 'sellers') involved along the supply chain. This is the largest economic impact affecting companies which we tried to monetise in the product-specific sections in terms of turnover, gross value added (GVA), and within the gross operating surplus (which is used to pay back the cost of capital, to meet taxes obligations, and generate profit for shareholders), with an outlook – where feasible – on personnel costs. The estimation method also considered that manufacturers have lost some revenue from the production of spare parts, as fewer are required in the era of fast-moving consumer goods.

Importantly, for several product groups, the overwhelming majority of producers is not located in the EU27. The additional sales volume from which they are benefitting does not benefit the European economy. Most of the electronics value chains are controlled by third-country companies, the EU having a very little or no share not only in final assembly and parts manufacturing, but also in the high value-added design and research & development activities.

As a direct negative impact on the economic system, repair service providers will not be asked to repair the good that was discarded. This effect is also monetised subsequently in terms of sales and GVA, as well as gross operating profits and personnel compensation foregone, but this impact proved to be significantly smaller in absolute value than the positive impact of additional revenues.

Finally, the last direct economic impact monetised concerns the loss of purchasing power of consumers, who could have used, or re-used a given product if repaired, but need to replace it instead. The money that they use for replacement could have been spent on other goods, services, or could have been saved. This negative impact is the most significant, outweighing any positive impacts to the ecosystem, i.e. the overall aggregate direct economic impact of premature disposal of consumer products is negative.

Various indirect impacts can also be outlined, such as the impact on the innovation potential and activity of European operators, shifting external trade patterns and current-account consequences, or the multiplier effects of the overall negative market impact (counting in

reduced purchasing power). However, due to lack of robust data, these have not been monetised.

3.7. Overall conclusion we concluded that there is a smaller problem of premature disposal of cars because, amongst other reasons, there is a well-established repair and second-hand market for cars as well as continuous remanufacturing of automotive components. Since cars represent the only product category for which we have not identified the problem of premature disposal, we calculated the overall environmental impact in two ways (see Table 22):

- Environmental impacts including cars
- Environmental impacts excluding cars

The high environmental impacts attributable to cars might give the reader the impression that the problem of premature disposal applies to cars. However, the comparatively high environmental savings associated with a lifetime extension of cars can be attributed to the high sales numbers and the disproportionately large amounts of materials such as steel and copper used in cars. Thus, extending the lifetime of cars might still result in environmental savings, although no problem of premature disposal has been identified. In comparison to other products, there is a well-established repair and second-hand infrastructure, which already contributes to a lifetime extension of cars.

For shoes the situation is the opposite. The number of shoes that could be avoided is very high. However, the related environmental impacts are small as the ecological footprint of shoes is relatively small when compared with other products.

In line with the consumer policy angle of the problem, the market failure to address is estimated in the most straightforward way by the losses in consumer welfare (i.e. a consumer detriment) that the premature disposal of goods causes. The main economic and psychological drivers discussed earlier lead to a situation where consumers cannot access repair or purchase second-hand/refurbished goods according to their true consumption preferences (or what their preferences would be in the case of better information and a more conducive regulatory environment).

A large share of the consumer detriment arising from the existing market failures concern cases where consumers would prefer a repair of their defective product outside the legal guarantee, but that option is not available or accessible, or is not economically attractive or convenient – due to various drivers that constitute part of the problem explained in the preceding sub-section. Consumers will thus consume fewer repair services and second-hand or refurbished goods that they would have liked to, while having to spend more on replacement products which reduces their spending power and hence limits their overall consumption when measured in natural units.

The economic model designed to measure this key aspect of market failure departed from the value of defective products (repairable consumer durables) not covered by the legal guarantee that are either replaced or repaired.⁶⁶ From this volume of products, only the

⁶⁶ Products that consumers continue to use despite their defect, and non-essential products that are no longer used but are not replaced either, are not counted in this calculation.

proportion corresponding to the share of the 'reluctant replacers' consumer segment (9.3%) was taken into account, and the consumer detriment was assumed to reach 5% of the value of these goods. This assumption was derived from earlier consumer survey results on the willingness-to-pay for repair, which on average was up to 30% of the price of a new good⁶⁷; and the estimated average repair cost amounting to 15% of a new product across all product groups included in the study (see Annex 3 – chapter 3 for more details).

The estimation of consumer detriment amounts to EUR 5.1 billion per year. To calculate this, the study used the estimated aggregate value (at constant 2019 prices) of defective products repaired or replaced, but not covered by the legal guarantee between 2023 and 2037. This estimate derives from the projected number of products sold in the EU and consumer survey results on the proportion of products repaired, specifically outside the legal guarantee, as well as the average 2019 product prices. The aggregate value has been multiplied by the share of the 'reluctant replacer' consumer segment (9.3% of the total), to reflect that the market failure is mostly concentrated in this category. The extrapolation factor of 5.74 was then applied to estimate the market failure for all repairable consumer durables.

It is to be noted, however, that this is an underestimation of the consumer welfare loss as the 'reluctant repairers' segment was not considered and neither were cases where the consumer does not replace or repair the defective product (but keeps using it or abandons it without equivalent replacement product). Also, the limited availability of refurbished products was not included in the analysis.

3.4. Evolution of the problem of premature disposal

The scale of the problem provides the basis for analysing how the problem of premature disposal of products will evolve in the next 15 years. In this context, different aspects must be considered.

First, the development of economic, regulatory, and psychological drivers, as well as of other drivers, have to be assessed. As the relevance of specific drivers depends on the respective product category, the evolution of the problem will be analysed and described on a product-specific basis. For this purpose, relevant foreseeable future changes to the EU regulatory framework (e.g. the ESPR initiative) were identified and described for each product category. The product-specific assessment of the problem evolution addresses e.g. issues such as Ecodesign or energy labelling and their impact on repair (e.g. some products were found to be more likely to be discarded due to decreasing energy efficiency or, conversely, to have a longer lifetime and be repaired more often due to Ecodesign requirements). This resulted in a first overview of future developments per product category (see Table 22).

This first overview was then elaborated by taking into consideration

- survey results on the development of consumer attitudes towards repair⁶⁸;

⁶⁷ Paying 30% of the price of a new product on repair is thus valued by the consumer equally to purchasing a new product at full price.

⁶⁸ This includes survey results on the question concerning the propensity of consumers to have a product repaired or replaced. Please note that this question was based on the assumption that the defect occurs

- the development of the second-hand market and the market for refurbished products; and
- the current and future role of different features in product design as perceived by manufacturers.

Similar to the information on relevant drivers, product-specific findings from the surveys concerning the evolution of the problem were incorporated into Table 22. This resulted in indications on future developments per product category which can be taken (with caution) as an indication of the future development of the analysed problem. The more general findings applying horizontally to several product categories are described further below.

Table 22 - Overview of product-specific conclusions on the future evolution of the problem

Product category	Conclusions on future evolution
Mobile phones/smart phones	The analysed data does not indicate that the problem of premature disposal of smartphones will cease to exist within the next decade. The market for new buyers is decreasing and second-hand markets are growing. However, sales of new products are still increasing and prices on new phones are going down, making it cheaper and hence easier to stay updated with the newest phone. The results of the consumer survey suggest that 68% of consumers would rather replace than repair their smartphone in the event of a defect. Consumer behaviour towards repair and replacement of mobile phones and smartphones can be expected to stay relatively unchanged if the market for repair services continues to be as it is today (see Figure 16).
Televisions	There is no indication that premature disposal of televisions will decline over the next decade, as new innovation enters the market and old models fail to comply with new software. It is uncertain to what extent an increasing second-hand market for electronics will affect the premature disposal of televisions. The results of the consumer survey indicate that 67% of consumers would rather replace than repair their television if a defect occurs. Consumer behaviour concerning repair and replacement of televisions can be expected to stay unchanged if the market for repair services continues to be as it is today (see Figure 16).
Refrigerators	There are several developments affecting the future evolution of the problem of premature disposal of refrigerators. Some of them are expected to reinforce the problem, while others are expected to reduce it. The analysis revealed that a considerable number of refrigerators are disposed of while still being functional. The results of the consumer survey indicate that 60% of consumers would rather replace than repair their refrigerator in the event of a defect. No indication was found that this phenomenon will stop soon. Therefore, it must be assumed that the problem of premature disposal of refrigerators will persist for the next 15 years.
Laptops	The high repair costs, the complex product design which hinders repair as well as the limited availability of spare parts, tools and information on repair contribute to premature disposal. Based on the literature review and the conducted interviews, it was not possible to identify any development or trend indicating the problem of premature disposal would radically decline without further intervention. Currently, 61% of consumers would rather replace than repair their laptop in the event of a defect, according to the consumer survey. The survey also shows that consumer behaviour concerning repair and replacement of laptops will stay unchanged if the market for repair services continues to be as it is today (see Figure 16).
Clothing	The growth of the fast fashion sector driven by both consumers and producers leads to the conclusion that the problem of premature disposal will persist in the next 10 years. This also becomes clear considering the multitude of drivers (especially economic and psychological drivers) leading to the premature disposal of clothing.

during the legal guarantee period (see chapter -180122992 and Table 15). Furthermore, this also includes the results of the question concerning the perception of the repair market (see Figure 16).

Product category	Conclusions on future evolution
	Based on the literature review, no development could be identified that is expected to reduce the problem of premature disposal to an extent which might lead to a disappearance of the problem. Currently, 79% of consumers would rather have their product replaced than repaired in the event of a defect according to the consumer survey. The fact that the share of consumers who are less likely to have a product repaired than replaced (33%) is higher than the share of consumers who are more likely to have a defective product repaired than replaced (22%) (see Figure 16) might contribute to a further decrease of the consumption lifetime.
Shoes	Similar to clothing, the most relevant drivers for premature disposal of shoes and footwear are economic and psychological drivers. Hence, it is mainly the growth of the fast fashion sector which drives the future evolution of the problem. In contrast to clothing, no information indicating an increasing size of the second-hand market for shoes and footwear could be identified. Considering the limited reparability due to the complex composition, the decreasing prices for new shoes as well as the development of the fast fashion business model, it can be concluded that the premature disposal of shoes and footwear will continue over the next 15 years. The consumer survey suggests that a high share of consumers (78%) would prefer replacement over repair in the event of a defect. Consumer behaviour based on the perception of the repair market (see Figure 16) might further contribute to a decreasing lifetime of shoes and footwear, as a high share of consumers are less likely to have products repaired than replaced (34%). Based on expert input, the repair market is considered rather static. This suggests that the problem of premature disposal of shoes is unlikely to change over the next 15 years.
Cars	Our findings indicate that the problem of premature obsolescence of products does not apply to cars. Hence, the evolution of the problem was not investigated.
Wooden furniture	It can be concluded that the early disposal of wooden furniture will still be a problem in the next 15 years. None of the trends or developments described are expected to decrease the problem of premature disposal of low-cost wooden furniture to an extent which would lead to the disappearance of the problem. On the other hand, when asked about the perception of the repair market, 30% of consumers indicated that they are more likely to have defective products repaired than replaced if the market for repair services continues to be like it is today. Currently, based on the results of the consumer survey, the share of consumers who would rather have their wooden furniture replaced than repaired is 56% and therefore lower compared with other products assessed within this study.

The information provided in Table 22 shows that, within the product categories assessed, there are developments which can be expected to reduce the problem of premature disposal in the future, whereas other developments are likely to increase the issue. Concerning the drivers, we conclude that none of the developments identified can be expected to reduce the problem of premature disposal to such an extent which would lead to the elimination of the problem. However, more general developments applying horizontally to several product categories must also be taken into consideration. They are described in the following sections.

The development of consumer attitudes towards repair

Findings from the consumer survey on the consumers' perception of repair show that, at least for most of the product categories assessed, consumer behaviour concerning the repair and replacement of products is more likely to stay unchanged if the market for repair services continues to be as it is today (this is already partly addressed on a product-specific basis in Table 22; see also Figure 16). Concerning the development of the repair market, our research suggests that there exist two opposing trends within the repair market. Within the next years some repair businesses are expected to grow, whereas others are at risk of

disappearing. The possible increase/decrease of the repair market seems to vary between product groups. Repair of electronics (particularly that of smartphones) is expected to grow, while the repair of clothing or furniture might decrease (see chapter 4.3. Scale and development of repair services sector for more details).

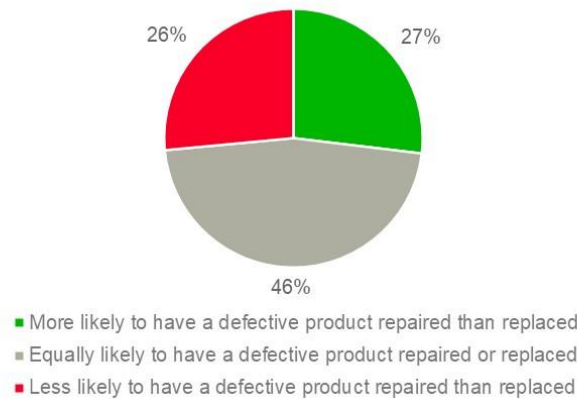
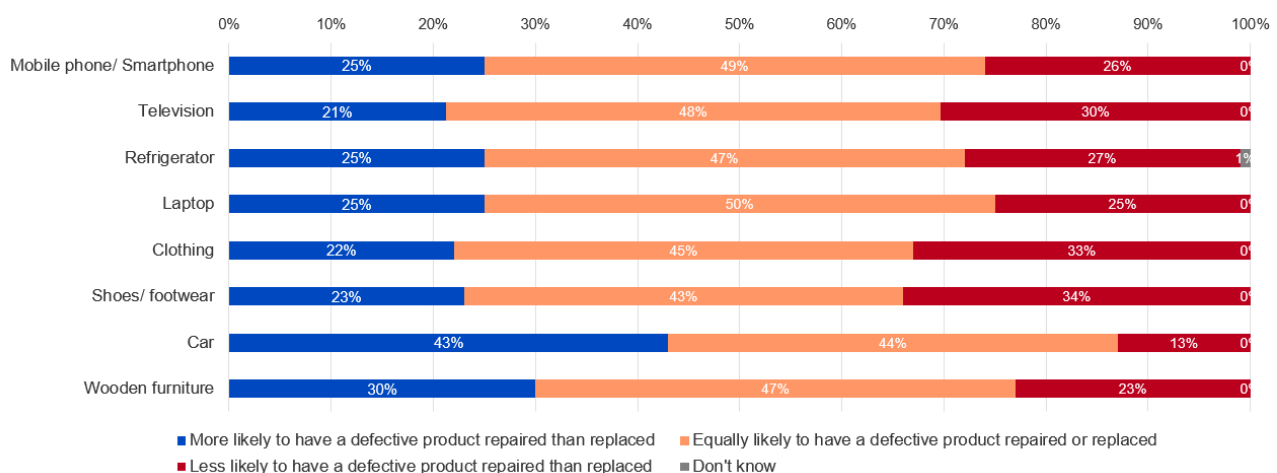


Figure 16 - Perception of the repair market among consumers

QB6: Thinking about the future, if the market for repair services for [PRODUCT] continues to be like it is today, do you think you will be ...?



Source: Authors based on consumer survey results

Moreover, the results of the consumer survey revealed that younger people are more likely to say that they tend to repair, indicating that repair could increase in the future due to the increased willingness to repair among younger generations. A clear conclusion on the extent to which the increasing willingness to repair among younger generations influences the problem of premature disposal cannot however be drawn.

Development of the market for second-hand and refurbished goods

Further aspects considered relevant for the evolution of the problem included the development of the second-hand market and the market for refurbished products. Although the literature suggests that the younger generation is more willing to buy second-hand

goods, the results of the consumer survey suggest that many consumers still want to have new products. Across all product groups, between around 20% and 30% of respondents claimed that they like to have new products. Other reasons indicated by consumers for not buying used products are described in chapter 4.4. Scale and development of second-hand and refurbishment sector The evolution of the second-hand market/market for refurbished products during the last ten years, as well as the predictions for the next 15 years, vary widely across different countries⁶⁹ and products. Most studies focus on the second-hand market for a particular product category (mostly, clothes) in a single country only. Available information suggests a growing second-hand market for electronics, meaning that more electrical and electronic products might receive a second life. A similar development is expected in the clothing sector, which is expected to significantly grow within the next years. As regards the development of refurbishment, it can be noted that shoes and footwear, cars and refrigerators are rarely refurbished, while refurbishment of clothing and wooden furniture is still a niche but emerging. In contrast, for mobile phones/smartphones and laptops as well as, to a lesser extent, for televisions, refurbishment represents a common practice. Specific conclusions on the development of the refurbishment market cannot be drawn based on the available data. However, the increasing relevance of the second-hand market for electronics suggests that more of these products will be refurbished in the future, contributing to an increase of the market for second-hand and refurbished electronics. This is assumed to reduce the problem of premature disposal of electronics and electrical devices, although the extent is unknown.

Current and future role of different features in product design as perceived by manufacturers

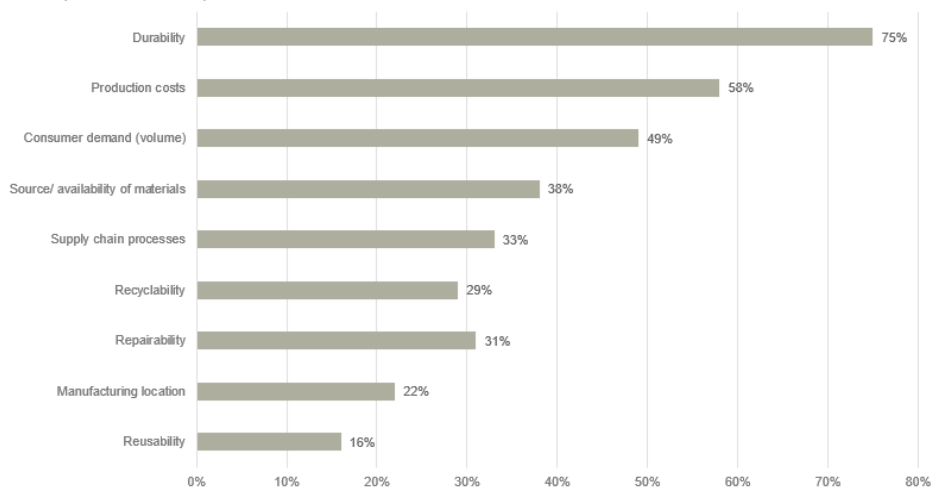
Based on the relevance that manufacturers attribute to different features currently and over the next decade (see Figure 17 and Figure 18) when designing products, it can be assumed that – although durability is considered the main priority – the increasing importance of reparability could improve the overall reparability of products and therefore reduce the relevance of some of the drivers (mainly economic drivers) contributing to the problem of premature disposal to some extent. The continuing focus on aspects of durability and the increasing importance of reusability might support the second-hand market as products are designed to last longer and be more reusable. However, conclusions on the extent to which aspects of durability and reusability will reduce the problem of premature disposal and the associated environmental impacts cannot be made, given the available data.

⁶⁹ Amongst the large European countries, Germany is the one with the biggest revenue from second-hand goods sales (2016: \$3,335.13 million, estimated to rise to \$3,570.08 million by 2023), while the lowest revenues were achieved in Greece (2016: \$11.15 million) and Slovenia (2016: \$3.08 million (Eurostat., 2019)).

Figure 17 - Features currently considered as being most important when designing a product as indicated by manufacturers in the business survey

Which of the following features do you currently consider as being the most important when designing a product?

Base = 55 responses (manufacturer)

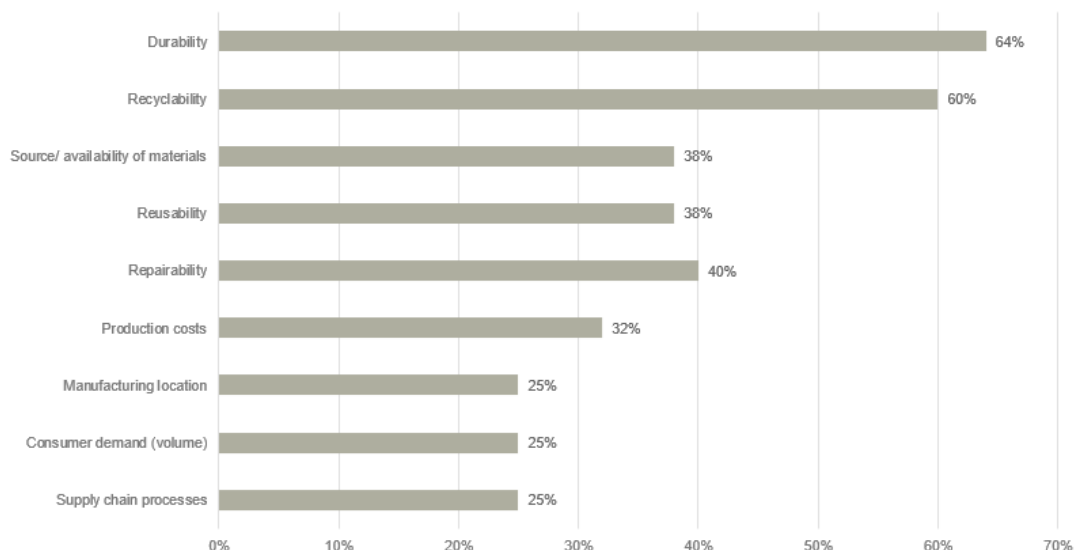


Source: Authors based on business survey exercise

Figure 18: Features which will become the most relevant in the next decade when designing a product as indicated by manufacturers in the business survey

Which of the features do you think will become most relevant in the next decade?

Base = 53 responses (manufacturer)



Source: Authors based on business survey results

Conclusion

The evolution of the problem of premature disposal within the next 10 years has been analysed for seven of the eight analysed product categories (see Table 22).⁷⁰ For most of the product categories, it was possible to identify developments that rather reinforce the problem of premature disposal, while others are likely to reduce it. However, based on the descriptions above, we assume that none of the developments outlined in Table 22 will reduce the problem to such an extent that would lead to the elimination of the problem within the next 15 years. On the other hand, general developments such as an increasing market for refurbished and second-hand electrical and electronic products, as well as the increasing importance that manufacturers assign to aspects such as reparability and reusability in product design, are expected to reduce the problem to a certain extent. However, consumers prefer replacement over repair (see Table 16) and data from the consumer survey indicates that this behaviour is likely to continue – at least for most of the product categories assessed – if there are no changes in the repair market.

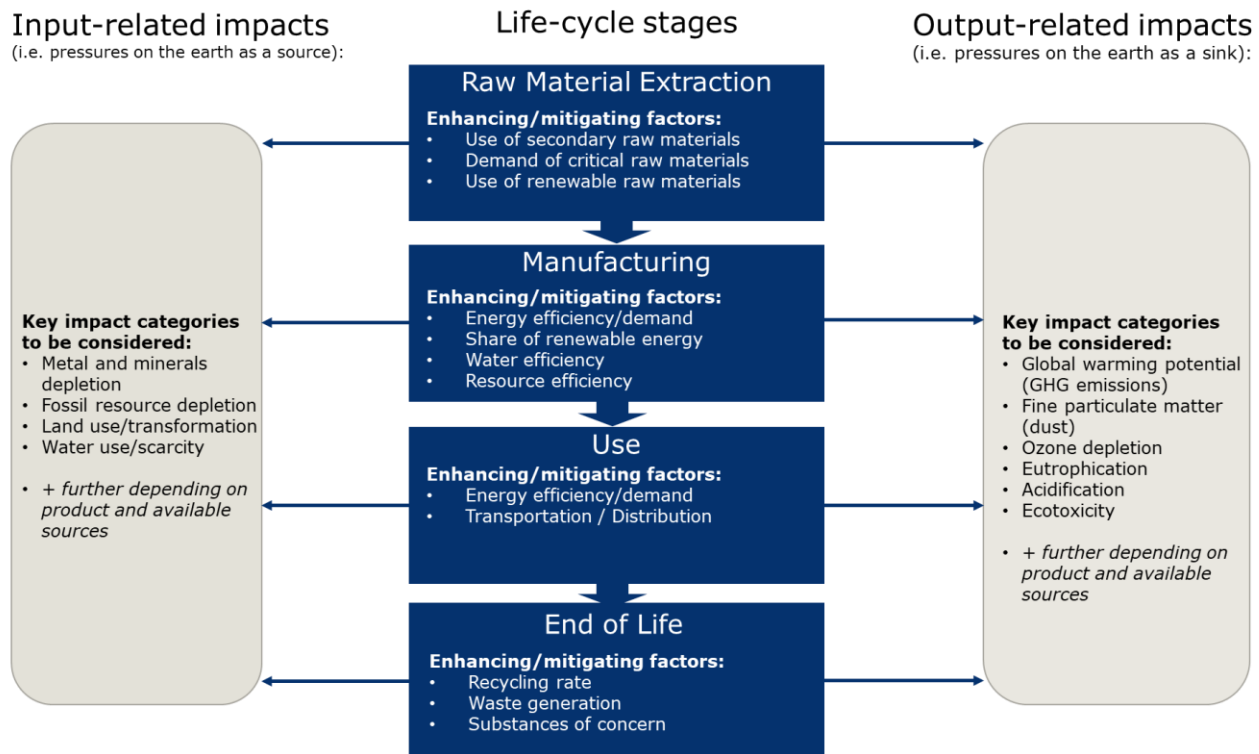
Overall, we conclude that, within the product categories assessed, the problem of premature disposal will still exist after 15 years. This applies in particular to product categories where multiple drivers contribute to premature obsolescence (see Table 15). Based on our analysis, this especially concerns electronics and ICT (including smartphones, televisions, and laptops), as well as the product categories connected to fashion aspects (including clothing, shoes and footwear and wooden furniture made of lower quality).

3.5. Environmental impacts

When assessing the environmental impacts of premature disposal, both input- and output-related impacts occurring in various life-cycle stages are relevant (see Figure 19). Input-related impacts refer to the use of (scarce) resources such as certain types of metals and minerals or fossil resources. Also, water use or certain types of land-use can cause environmental impacts in areas with water scarcity or where land transformation causes negative impacts on the surrounding environment. Output-related impacts refer to the implications on water, soil and air caused by actions within the product lifecycle. Examples of such implications are global warming, ozone depletion, acidification, ecotoxicity etc.

Figure 19 - Approach when assessing environmental impacts of a product category

⁷⁰ For cars, the evolution of the problem was not investigated since no problem of premature disposal has been identified.



Source: The figure is based on general methodological approach as adopted for Life Cycle Assessments, i.e. used in ISO standards such as ISO 14040:2006.

In the following section the different life cycle stages will be described with the use of examples from different product categories.

3.5.1. Raw Material Extraction

Raw materials are needed in the production phase of all consumer goods. Depending on the product category, however, the type of materials needed and where they are geographically extracted varies. Laptops are associated with high input-related impacts in this phase as the production requires several critical raw materials as well as various precious metals. At the same time, mining and extraction activities have several output-related impacts, including loss of biodiversity, contamination of groundwater and soil acidification.

Other product categories are made from renewable raw materials or maybe recycled materials and hence depletion will be of lower relevance. These materials can, however, cause other negative impacts. An example of such material extraction is cotton for the textile industry. This plant-based material is a renewable resource but at the same time the production of one tonne of textiles requires 200 tonnes of water – mostly used for the irrigation of cotton plants (Niinimäki et al., 2020a). And when assessing the output-related impacts connected to cotton farming, large amounts of pesticides for the cultivation of cotton is just one of the most prominent examples.

3.5.2. Manufacturing

Energy, resource use and efficiency are the enhancing or mitigating factors when assessing environmental impacts of the manufacturing phase. Input-related impacts concern the use of e.g. fossil fuels, water, chemicals etc., while the output-related impacts could be greenhouse gas (GHG) emissions linked to the use of fossil fuels. Textiles are an example of a high impact product category in the manufacturing phase as their production, alongside that of aluminium, produces the most GHG emissions per unit of material and causes 10% of the global GHG emissions. Four fifths of these emissions come from the production of clothes (Niinimäki et al., 2020b).

3.5.3. Use

The environmental impacts connected to the use phase of products are mostly relevant for energy-using products (EuP). Therefore, non-electronic products such as most shoes and furniture have limited to no appreciable impacts in this phase unless transportation from production site to sellers/consumers is considered. Although textiles are not directly dependant on power to function, a high degree of maintenance through washing is required where microplastics and chemical substances from the manufacturing phase might pollute the water discharge. For other production categories this phase is even more crucial when assessing the environmental impacts: e.g. refrigerators (and freezers) as they usually run and consume energy 24 hours a day 365 days a year and actually the most significant contribution to global warming potential (GWP) comes from the energy consumption during the use phase.

When assessing the potential of extending the lifetime of consumer goods, a decrease in the environmental impacts related to material extraction, production, transportation, and end of life (EoL) can be expected as the production of new products will be avoided. However, for product categories with high impacts in the use phase and/or exhibiting non-linear dynamics of technological efficiency improvements and efficiency degradation over time, an extended lifetime can cause negative impacts as e.g. more energy-efficient models enter the market (Hummen & Desing, 2021). The table below provides a qualitative overview of the assumed relevance of impacts connected to the use phase for the selected product categories.

Table 23 - Overview of the assumed relevance of impacts connected to the use phase

High Relevance	Medium Relevance	Low Relevance
- cars - refrigerators - televisions	- laptops - mobile phones - clothing	- shoes/footwear - wooden furniture

3.5.4. End of Life (EoL)

The environmental impacts at EoL are highly affected by the level of utilisation of the embodied resources as reuse and recycling can significantly decrease the environmental impacts associated with manufacturing of new products. To use the example of laptops as described under the section of raw material extraction, the production of laptops is reliant on

a considerable amount of important raw materials such as rare metals. Today, these resources are lost either entirely or to a large extent in the recycling process. The environmental impacts related to raw material extraction could however be mitigated if these materials were to be recovered instead.

During waste handling processes (whether that be recycling, incineration or landfilling), it is also significant to address the treatment of substances of concern, e.g. ozone depleting substances from refrigerators such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs).

3.5.4. Summary of environmental impacts

Previous sections have outlined the environmental impacts which are related to the production, consumption, and end-of-life management of products. The most important findings related to environmental impacts throughout the life cycle of the studied products are presented in the table below. For each of the product categories overall points of attention are presented, i.e. the life cycle stage(s) which are most relevant in terms of the environmental impact.

Table 24 - Qualitative synthesis of environmental impacts throughout the life cycle of products

Product Category	Conclusions on Environmental Impacts
Mobile phones/smart phones	• Point of attention: Raw material extraction and manufacturing phase • Manufacturing is related to significant resource depletion and associated with high energy demand and pollution during extraction • Increasing trend regarding electricity consumption during the use phase of a mobile phone due to higher complexity of features • Small share of end-of-life treatment in the total life cycle GHG emissions; hibernation state of devices is identified as main obstacle for recycling and further treatment
Televisions	• Point of attention: high significance of the production phase in terms of material resource consumption (metals in printed circuit boards) and associated impacts; and of the use phase in terms of electricity consumption and associated GHG emissions • Environmental impacts vary across TV types (LED, LCD, CRT, plasma) • Negative trends in energy efficiency due to more complex features (e.g. smart TVs) • Potential environmental benefits due to the recovery of metals from printed wiring boards; negative impacts in terms of GHG emissions and toxicity indicators due to the incineration of plastic parts
Refrigerators	• Point of attention: high significance of the production phase in terms of material resource consumption (metals) and associated impacts; and of the use phase in terms of electricity consumption and associated GHG emissions • Main resources used: plastics, large amounts of iron ores, copper, and aluminium – all associated with high energy demands during extraction or production • Large amounts of electricity, water and steam required for manufacturing

Product Category	Conclusions on Environmental Impacts
	• Despite improvements in energy efficiency (by 60% between 1980 and 2012): high significance of the use phase; in contrast to other electronic devices all-year and non-stop electricity consumption • Positive environmental impacts across multiple impact categories due to high recycling rate and recovery of main materials; pollution effects due to landfilling or incineration of remaining waste
Laptops	• Point of attention: raw material extraction and manufacturing (together >70% of the GHG emissions throughout the life cycle) • Depletion of (critical) metal resources and energy- and land-intensive mining of raw materials leading to different kinds of pollution (groundwater and soil) and biodiversity loss • Energy-intensive manufacturing • Relatively low electricity consumption in the use phase compared with other electronic products • Increase of energy efficiency by 50% between 1990 and 2012, however trend towards higher processing capacity resulting in higher electricity demands • Potential to reduce environmental impacts (e.g. depletion of metal resources or product carbon footprint) by increasing recycling rates; low contribution (<1%) to total GHG emissions throughout the life cycle
Clothing	• Point of attention: raw material production and manufacturing (together > 75%) but significant share of the use phase (20%) in terms of GHG emissions • Water and energy consumption and CO2 footprint highly depend on the main material of the item of clothing (e.g. water-intensive production of cotton and wool) • Use of more than 15,000 chemicals during manufacturing leading to significant water pollution • Environmental impacts in the use phase highly dependent on the washing scenario and the environmental footprint of the washing machine • Low recycling rates; common waste treatments: incineration or landfilling; low contribution to total GHG emissions throughout the life cycle
Shoes/footwear	• Point of attention: raw material extraction and manufacturing across different impact categories • Dependence of impacts on basic shoe material: a variety of resources needed, and emissions generated to produce leather, rubber, and synthetic materials • Negligible impacts in the use phase • Groundwater and soil pollution in the end-of-life phase (mostly landfilling); low recycling and reuse rates
Cars	• Point of attention: production phase in terms of material consumption; use phase in terms of energy consumption and GHG emissions due to fuel manufacturing and driving • High share of metals in cars (>80%); trends in the material composition: fewer ferrous metals, more non-ferrous metals, and plastics • Use of scarce metals and critical raw materials (e.g. natural rubber) • Water- and energy-intense manufacturing • Environmentally sound end-of-life management of most used cars (two thirds) with high recycling rates for main materials; emissions of GHG and persistent organic pollutants (POPs) due to incineration of automotive shredder residues (increasing share) • Contradictory scientific findings regarding the benefits of lifetime extension of cars; possible trade-off between extended lifetime of old vehicles and fuel efficiency of newer ones in the use phase

Product Category	Conclusions on Environmental Impacts
Wooden furniture	• Point of attention: production and treatment of raw materials (more than 80% of total impacts) • Main resources used: wood, hazardous additives, resins, energy • Effects on biodiversity (habitat loss and degradation, population decrease of species) due to (illegal) deforestation • Relevance of transport for carbon footprint in the case of non-regional providers of raw materials (e.g. large transport distances for tropical wood) • Secondary role of manufacturing, use and end-of-life phase (mostly incineration) regarding environmental impacts • Higher impact of furniture made of wood-based materials (e.g. medium-density fibreboard, MDF) than furniture made of solid wood due to the consumption of energy and chemicals

3.6. Economic impacts

The economic impacts assessed in this report revolve around the most important and direct monetary (or monetisable) consequences of the premature disposal of products, separately for the four main stakeholder categories: (i) manufacturers (globally and those located in the EU separately); (ii) sellers (traders); (iii) repair services; and (iv) consumers – and in addition, workers in manufacturing, trade, and repair. The consequences have been monetised, although this only serves to give a dimension to the impacts, the calculated numbers should not suggest a high degree of precision.

The natural first-round effect of premature disposal of durable consumer products is that these products cease to be available for further use, either by the original owner or by another consumer (friends and family, second-hand buyer), hence the existing consumption need will have to be satisfied by a new replacement product or being kept unsatisfied. Premature disposal also includes cases where the original owners do not wish to replace the product themselves, but by not putting it onto the second-hand market they will not enable the discarded product to satisfy a relevant consumption need.

There are some differences between the types of products covered in this regard. The given product and hence its replacement can be regarded as more or less essential for six of the eight product groups (mobile phones, refrigerators, laptop computers, televisions, cars, much of wooden furniture), while this is not necessarily the case for footwear and clothing, where consumers would normally have a number of alternatives (i.e. other clothes and shoes) readily available for a given discarded piece that they could use. In any case, when modelling the effects, it was assumed for simplicity that the unmet need will need to be satisfied at some point in time.

This results in an unmet consumer need, which will facilitate producing, importing and selling new products, increasing the economic activity of the manufacturers, importers and retailers (the 'sellers') involved along the supply chain. This is the largest economic impact affecting companies which we tried to monetise in the product-specific sections in terms of turnover, gross value added (GVA), and within the gross operating surplus (which is used to pay back the cost of capital, to meet taxes obligations, and generate profit for shareholders), with an

outlook – where feasible – on personnel costs. The estimation method also considered that manufacturers have lost some revenue from the production of spare parts, as fewer are required in the era of fast-moving consumer goods.

Importantly, for several product groups, the overwhelming majority of producers is not located in the EU27. The additional sales volume from which they are benefitting does not benefit the European economy. Most of the electronics value chains are controlled by third-country companies, the EU having a very little or no share not only in final assembly and parts manufacturing, but also in the high value-added design and research & development activities.

As a direct negative impact on the economic system, repair service providers will not be asked to repair the good that was discarded. This effect is also monetised subsequently in terms of sales and GVA, as well as gross operating profits and personnel compensation foregone, but this impact proved to be significantly smaller in absolute value than the positive impact of additional revenues.

Finally, the last direct economic impact monetised concerns the loss of purchasing power of consumers, who could have used, or re-used a given product if repaired, but need to replace it instead. The money that they use for replacement could have been spent on other goods, services, or could have been saved. This negative impact is the most significant, outweighing any positive impacts to the ecosystem, i.e. the overall aggregate direct economic impact of premature disposal of consumer products is negative.

Various indirect impacts can also be outlined, such as the impact on the innovation potential and activity of European operators, shifting external trade patterns and current-account consequences, or the multiplier effects of the overall negative market impact (counting in reduced purchasing power). However, due to lack of robust data, these have not been monetised.

3.7. Overall conclusion

The phenomenon of premature disposal of consumer goods represents a complex problem. This is due to the involvement of numerous stakeholders and the various drivers that contribute to the problem. Based on our assessment, we conclude that for seven of the eight product categories assessed there is a problem of premature disposal, leading to a reduced consumption lifetime for these products.

Within the context of the current study, two overarching problem aspects were identified based on literature review and expert interviews:

- Goods are not used for as long as they could be because they are not repaired
- Limited use of second-hand goods by consumers

Furthermore, we identified a total of ten drivers, including economic, regulatory, and psychological drivers. Six of these drivers are considered to be highly relevant as regards their contribution to the problem of premature disposal of consumer goods because they apply to all – or at least most of the – product categories and/or are mentioned by a relatively high share of consumers as a reason for not having a product repaired. These are:

- repair is not economically attractive for consumers (i.e. buying new products is cheaper than repair) (economic driver);
- consumer preference for new goods (psychological driver);
- the product design makes the products difficult to repair (economic driver);
- the efforts required for repair (economic driver);
- the lack of a convenient infrastructure; and
- limited consumer acceptance for second-hand goods (psychological driver).

The remaining four drivers are considered to be of medium or limited relevance as they only apply to a limited number of product categories and are mentioned only by a rather small share of consumers as a reason for not having the product repaired⁷¹. Overall, it can be concluded that high repair costs represent the most relevant driver contributing to the premature disposal of products.

In regard to the scale of the problem, the combined data on the different product categories provides an indication that in the EU, approximately 30% of products are repaired, suggesting that more than two thirds (70%) of products are not repaired. This however represents an approximate estimation on the basis of a selection of highly relevant consumer products and, as such, needs to be interpreted with caution. In addition, for the product categories studied, it seems that only a relatively small share of consumers – between 9 and 25% of consumers – purchases second-hand products. Furthermore, data suggest that the scale of the problem differs from one MS to another and between product categories. However, it was not possible to identify any regional trends or draw specific conclusions on the exact extent to which the scale of the problem varies from one MS to another.

Our analysis concerning the future development of drivers for each of the individual product categories leads to the assumption that the problem of premature disposal could still exist in 10 years. This applies in particular to those product categories where multiple drivers contribute to the problem of premature disposal. Based on our analysis, this is especially the case for electronics and ICT (including smartphones, televisions, and laptops), as well as for those product categories connected to fashion aspects (including clothing, shoes and footwear and wooden furniture made of lower quality). On the other hand, there are general developments, such as an increasing market for refurbished and second-hand electrical and electronic products, as well as the increasing importance assigned by manufacturers to aspects such as reparability and reusability in product design, which need to be taken into consideration as they might mitigate the problem of premature disposal to a certain extent. Nonetheless, data shows that consumers prefer replacement (61%) over repair (35%) (see

⁷¹ Drivers with limited or medium relevance are i) lack of trust in repair; ii) insufficient knowledge to make an informed repair or purchasing decision; iii) lack of incentives for producers to make spare parts, repair tools and information on repair available; and iv) repair is not economically attractive for producers as it limits their sales of new products.

Table 16)⁷². Data from the consumer survey indicates that this behaviour is likely to continue – at least for most of the product categories assessed – if there are no changes in the repair market.

In terms of environmental impacts, the identified problem of premature disposal of products is connected to the sub-optimal use of resources associated with the production of goods and CO₂ emissions and waste generated without corresponding material benefits for consumers and society.

In terms of direct economic impacts, these are summarised as followed:

- On one hand the unmet consumer need which results from limited product longevity does facilitate the production, importation, and sales of new products, increasing the economic activity of the manufacturers, importers and sellers (the 'sellers') involved along the supply chain. However, for the majority of these products this benefits production that is outside the EU.
- There is also a loss of revenue for the repairers who are largely located within the EU;
- Finally, there is also a loss of purchasing power for consumers who could have used or re-used a given product but needed to replace it instead.

⁷² 65% of consumers would always or probably have a product replaced, compared to only 31% who would probably or always have it repaired.

4. Market analysis of repair services sector

The aim of this chapter is to examine market practices and value chains relating to repair services (during and outside legal guarantee) and to the sale of refurbished and second-hand goods. The chapter also gives insight on the overall situation and the development of the repair services sectors.

4.1. Distinguishing repair, refurbishment and reuse

To examine the value chains relating to repair services and to the sale of refurbished and second-hand goods, a definition of these concepts is crucial. 'Repair' and 'refurbishment' are not defined in already adopted EU legislation in the context of products selected for this study⁷³, but definitions can be found in proposed legislation, more concretely in the Proposal for ESPR (see table below). 'Reuse' and 'preparation for reuse' is defined under the Waste Framework Directive (WFD, Directive 2008/98/EC)⁷⁴.

Table 25 - Definitions for Repair, Reuse, Preparation for reuse and Refurbishment.

Criteria	Definition
Repair	Returning a defective product or waste to a condition where it fulfils its intended use (ESPR Proposal ⁷⁵)
	Returning a faulty or broken product or component back to a usable state (British standard ⁷⁶)
Reuse	Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived (WFD, Article 3 (13) ⁷⁷)

⁷³ Refurbishment is legally defined in the context of medical devices, but not in the context of the products selected for this study. See Regulation (EU) 2017/745 on medical devices <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02017R0745-20200424&from=EN> and Regulation (EU) 2017/746 on in vitro diagnostic medical devices <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02017R0746-20220128&from=EN>

⁷⁴ DIRECTIVE 2008/98/EC (WFD): <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008L0098&from=EN>.

⁷⁵ Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for setting eco-design requirements for sustainable products. 2022: https://environment.ec.europa.eu/publications/proposal-ecodesign-sustainable-products-regulation_en

⁷⁶ British Standard: <https://shop.bsigroup.com/ProductDetail/?pid=000000000030182997>.

⁷⁷ DIRECTIVE 2008/98/EC (WFD): <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008L0098&from=EN>.

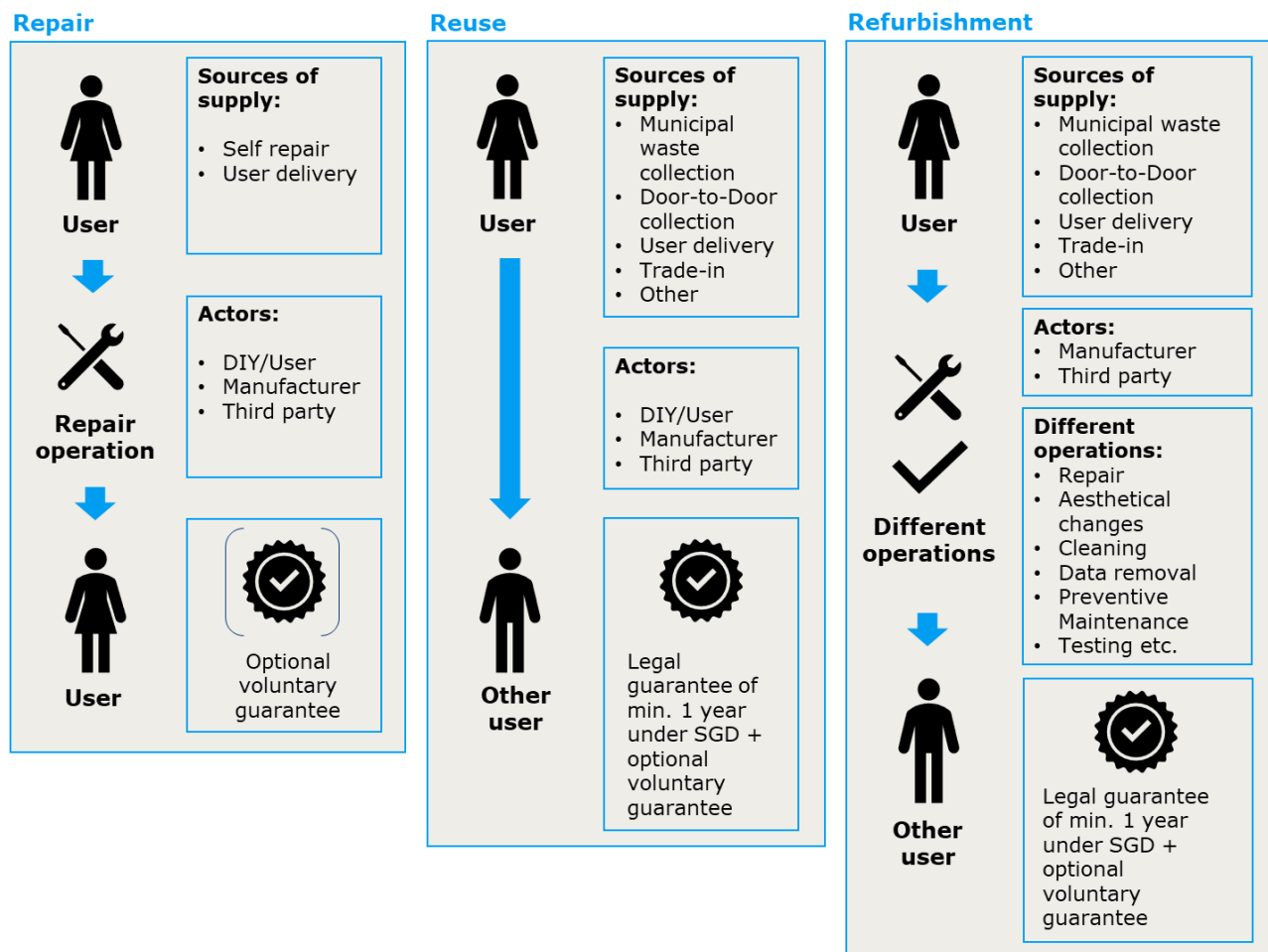
Criteria	Definition
Preparation for re-use	Checking, cleaning, or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing (WFD, Article 3 (16)) ⁷⁸
Refurbishment	Preparing or modifying an object that is waste or a product to restore its performance or functionality within the intended use, range of performance and maintenance originally conceived at the design stage, or to meet applicable technical standards or regulatory requirements, with the result of making a fully functional product (ESPR Proposal)⁷⁹ Return a used product to a satisfactory working condition by rebuilding or repairing major components that are close to failure, even where there are no reported or apparent faults in those components' (An added note to this definition clarifies that refurbishing efforts involve the replacement of worn or broken parts, generally less extensive than required to remanufacture products, but more than necessary to repair them) (British Standard BS 8887-2:2009)

Figure 20 displays the mentioned concepts in a graphical manner according to existing definitions and additional stakeholder input that we collected for the purpose of this study (such as interviews and the consumer survey).

Figure 20 - Graphical and simplified description of the concepts repair, refurbishment, and (direct) reuse for the purposes of this study

⁷⁸ DIRECTIVE 2008/98/EC (WFD): <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008L0098&from=EN>.

⁷⁹ Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing a framework for setting eco-design requirements for sustainable products. 2022: https://environment.ec.europa.eu/publications/proposal-ecodesign-sustainable-products-regulation_en



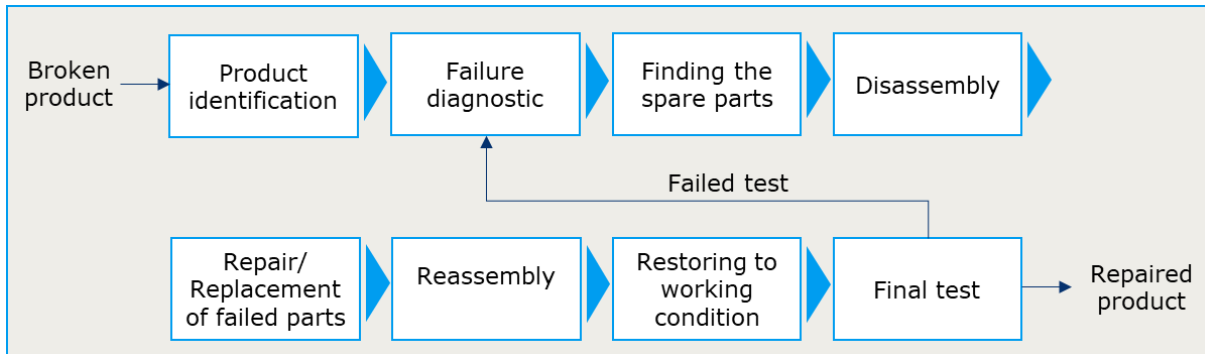
Source: Inspired by Gustavsson et al. (2020) and stakeholder input

The following descriptions go beyond the pure definitions and describe typical steps which are related to repair, refurbishment, and reuse in practice.

Repair includes fixing a fault and the replacement of part of the components to ensure the quality and functionality of the product/component. Hence, repair operations involve significant modification of the equipment and generally require technical skills and time (e.g. change of a spare part, disassembly of the equipment). Typical repair steps are displayed in Figure 21. Repair operations aim to extend the duration of the product's service life, as they allow postponing the disposal of a product. However, repair can also be applied to products that have become waste. In these cases, the repair operation is considered 'preparation for reuse'⁸⁰ as defined in Article 3 of the WFD. Typically, when performing repair, the owner stays the same. The owner can conduct the repair themselves or otherwise commission an independent or contracted repairer or the manufacturer of the respective product.

⁸⁰ Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing (DIRECTIVE 2008/98/EC (WFD)).

Figure 21 - Typical repair steps.



Source: Adapted from Cordella (2016) and Sabbaghi et al. (2017).

‘Preparing for reuse’ allows for waste to return back into a product (see WFD). Hence, repair, cleaning, refurbishment, and similar activities can be ‘preparation for reuse’ activities when they are applied to waste. If repair, cleaning, refurbishment, and other activities are applied to products that have not been waste, these activities are reuse activities.

‘Reuse’ is defined in the WFD, Article 3(13) as ‘any operation by which products or components that are not waste are used again for the same purpose for which they were conceived’. This means that repair and refurbishment activities can be considered a ‘reuse’ activity when they handle products (not waste). Reuse can also be used in the sense of ‘direct reuse’, meaning that products are ‘sold as collected’ and did not undergo any further repair or reconditioning activities.

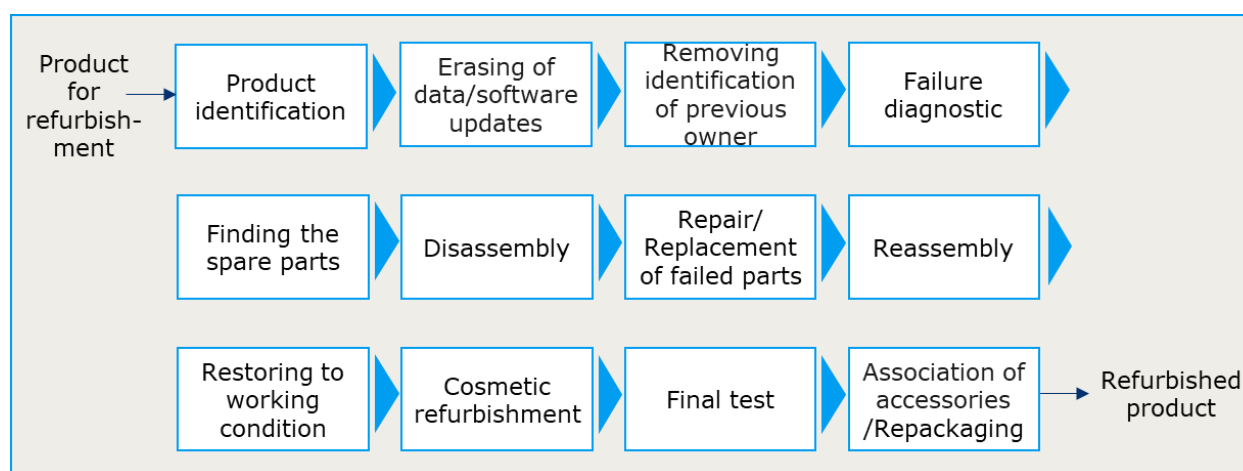
Different types of **reuse** were identified in literature and through interviews with experts:

- Private reuse of owners;
- Reuse by friends (i.e. products are given away for free or for low budget);
- Reuse on platforms like eBay (i.e. private, and commercial sellers exchange products);
- Reuse including refurbishment activities on commercial or charitable basis;
- Reuse without refurbishment on commercial or charitable basis or similar activities (e.g. old clothes collection and redistribution); Typical reuse actors are social companies or municipalities, which perform door-to-door collection, operate second-hand stores, or provide collection containers in public spaces.
- Commercial reuse with only minor refurbishment like cleaning (e.g. second-hand market for cars).

According to the definition of the WFD, the same or another user can reuse a product. Within this study, a reuse that implies an ownership change might be of a greater interest. Usually, this is then called **‘second-hand’** sale. Second-hand is legally not defined but based on the stakeholder experience, it means that a product is transferred from one person to another. This can happen on a consumer-to-consumer (e.g. flea market, eBay etc.) or on a commercial basis (e.g. resale after refurbishment). In consequence this mean that refurbishment and all forms of reuse can be considered second-hand if an ownership change takes place.

According to the literature, **refurbishment** (also sometimes referred to as 'reconditioning') goes beyond repair, however, repair operations can be part of the refurbishment process. Typical operations include for example: visual inspection, testing procedures, erasing of data and software updates (for IT and telecommunications devices), removing the identification of the previous owner (removing stickers, labels, etc.), repackaging, adding accessories, etc. Typical steps of the refurbishment process are displayed in Figure 22. To make a refurbished product attractive for a new user, refurbishment activities include aesthetical changes in addition to functional changes. The resold product aims to be 'as if new'. Contrary to repair, refurbishment is not done by users themselves, but is considered a commercial activity which is performed by manufacturers or third parties.

Figure 22 - Typical refurbishment steps, compiled with input from different source and stakeholders.



In the consumer survey and in the business survey⁸¹ carried out for the purpose of this study, the respondents were asked what they consider as typical characteristics of a refurbished good.

Respondents of the business survey stated that refurbished products are professionally cleaned, sanitised, and look like new (including aesthetically repaired, if necessary). While most consumers assume that refurbished goods are used items, only one third of the businesses agrees with this assumption.

Proposed definition of refurbished goods

As there is not yet a legally binding definition of **refurbishment** or **refurbished products**, one task of this report is to define the term 'refurbished goods' based on literature and stakeholder consultation (including commercial actors and consumers). To do so, existing definitions in literature, best practice refurbishment processes and business and consumer survey data were used. To derive our own definition, we will then combine the overlapping statements. For further policy making related to refurbishment/refurbished product, the proposed definition of 'refurbishment' under the ESPR Proposal should be considered (see

⁸¹ Note: 29 responses on the questions about refurbished products were gathered.

definitions in Table 25 - **Definitions for Repair, Reuse, Preparation for reuse and Refurbishment**. Table 25). Based on the different perceptions of refurbished goods, it is proposed to use a definition of 'refurbished goods' based on the definition included in the British Standard and to define processes that are essential to create a 'refurbished product'.

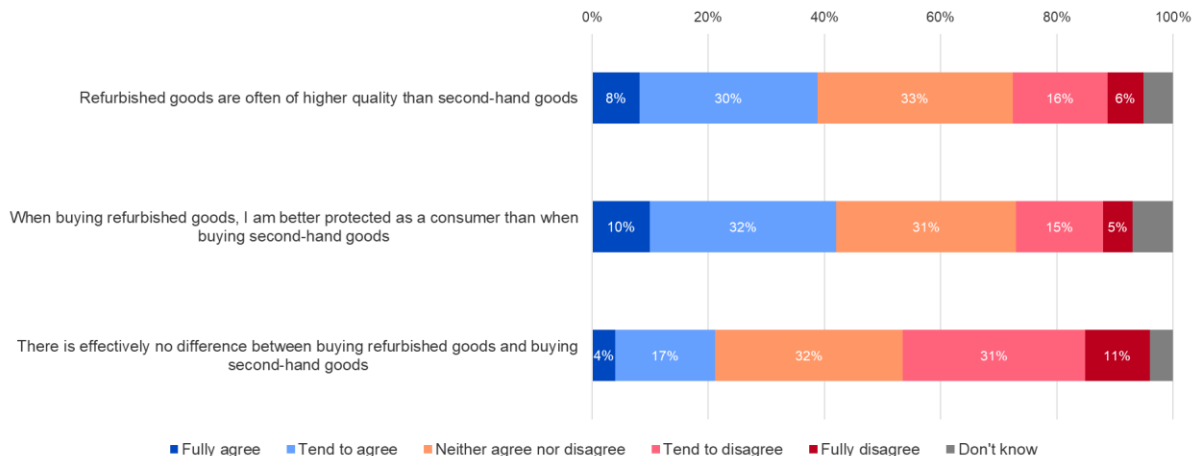
Proposed definition of a refurbished product:

Returning a used, unsold or returned product to a satisfactory technical, functional, aesthetic and hygienic condition. This includes, where necessary:

- a. Professional rebuilding or repairing of major components that are close to failure.*
- b. Professional functional testing.*
- c. Professional data deletion; and*

As the following figure shows, around 40% of the consumers surveyed agree or tend to agree with the statement that refurbished goods are of higher quality than second-hand goods and offer greater consumer protection. However, about 30% are undecided about this statement. Nevertheless, most respondents are aware that there is a difference between buying a refurbished product and a (non-refurbished) second-hand product (see last statement in the figure below).

Figure 23 - Comparing refurbished goods with second-hand goods, to what extent do you agree or disagree with each of the following statements?



Source: Authors based on Consumer Survey results

4.2. General assessment of market practices and value chains in the repair services sector

As described in earlier chapters, repair can be performed under or outside the legal guarantee. In the following, market practices and actors within the repair services sector (see definitions of actors in table below) will be described for the different guaranteed

scenarios. Since commercial guarantees are becoming more common, they are considered as well. Please note that the whole chapter is mainly based on stakeholder input (see stakeholder list in Annex 1) and supplemented with data from a mystery shopping experiment, a consumer and a business survey carried out for the purpose of this study.

Table 26 - Definitions for different types of repairs:

Terminology	Description
Contracted/Authorised repairers	They have repair contracts with manufacturers, sellers, or insurances. They have prioritised access to original spare parts. Many authorised repairers repair under the legal guarantee (if agreed with the seller), under the commercial guarantee (if agreed with the manufacturer) and offer independent services beyond the legal or commercial guarantees. Usually, authorised repairers have contracts with several manufacturers.
Independent repairers	They have no contracts with manufacturers or other parties. They can offer repair under and outside the legal guarantee and under or outside the commercial guarantee. However, the guarantees usually become void when an independent repairer repairs under the legal or commercial guarantee. Independent repairers are mainly consulted for repairs beyond guarantees.
Manufacturer customer service	Manufacturer customer services offer in-house repair. These repair workshops only work for one manufacturer and do not have contracts with other manufactures.

The business survey results evidenced that the repairs by retailers and manufacturers are done in-house in the majority of cases (69%). This is especially true for the retailers of refurbished goods, where that number reaches 80%. The second most common option is a repair carried out by an authorised repairer (36%). This is especially the case for large companies with over 250 employees (68% of them said that they used the services of an authorised repairer, compared with around 30% for SMEs who said the same). The fact that larger enterprises resort to authorised repairers more than SMEs can be explained by the fact that a repairer needs to conclude a contract with another company in order to be authorised, which creates an administrative burden that the smaller companies are less likely to undergo. The third type of repairs most commonly offered is at an independent repairer, scoring 24%, just ahead of 'at the manufacturer' (18%). The latter answer option was displayed only to retailers of goods.

4.2.1. Repair under the legal guarantee

If a product breaks during the legal guarantee period, a consumer in the EU has the right to make a claim towards the seller in order to get the product brought back to conformity. The consumer can ask the seller, who is the contractual counterpart, to replace or repair the product (ADEME et al., 2018) (see box below).

Basics of the legal guarantee:

- EU consumer law sets out a minimum 2-year guarantee (legal guarantee) as a protection against faulty goods, or goods that do not look or work as advertised, provided that the defects existed at the time when the goods were delivered (even if they became apparent later, during the legal guarantee period).
- Customers have the right to ask for any of the following remedies without any charge (for postage, labour, material, etc.):
 - repair of the product
 - replacement of the product
 - Under specific conditions (e.g., repair or replacement is impossible) consumers might get a price reduction or can terminate the contract (see DIRECTIVE (EU) 2019/771 for further details).
- SGD (DIRECTIVE (EU) 2019/771) lies down a 'hierarchy of remedies': Repair and replacement

Hence, when a product is defective, the consumer typically contacts the seller. According to stakeholders, most manufacturers offer free-of-charge commercial guarantees ('manufacturer guarantees') for the first 2 years after the purchase of a product to reduce the burden on the seller. As a consequence, during the first two years the consumer is normally entitled to remedies both under the legal guarantee towards the seller and under the commercial guarantee towards the manufacturer. Stakeholders from the repair industry claimed that in practice the legal guarantee can be neglected as an additional manufacturer guarantee is nearly always given. Stakeholders explained that in this case manufacturers cover the costs for the sellers in the framework of a B2B arrangement.

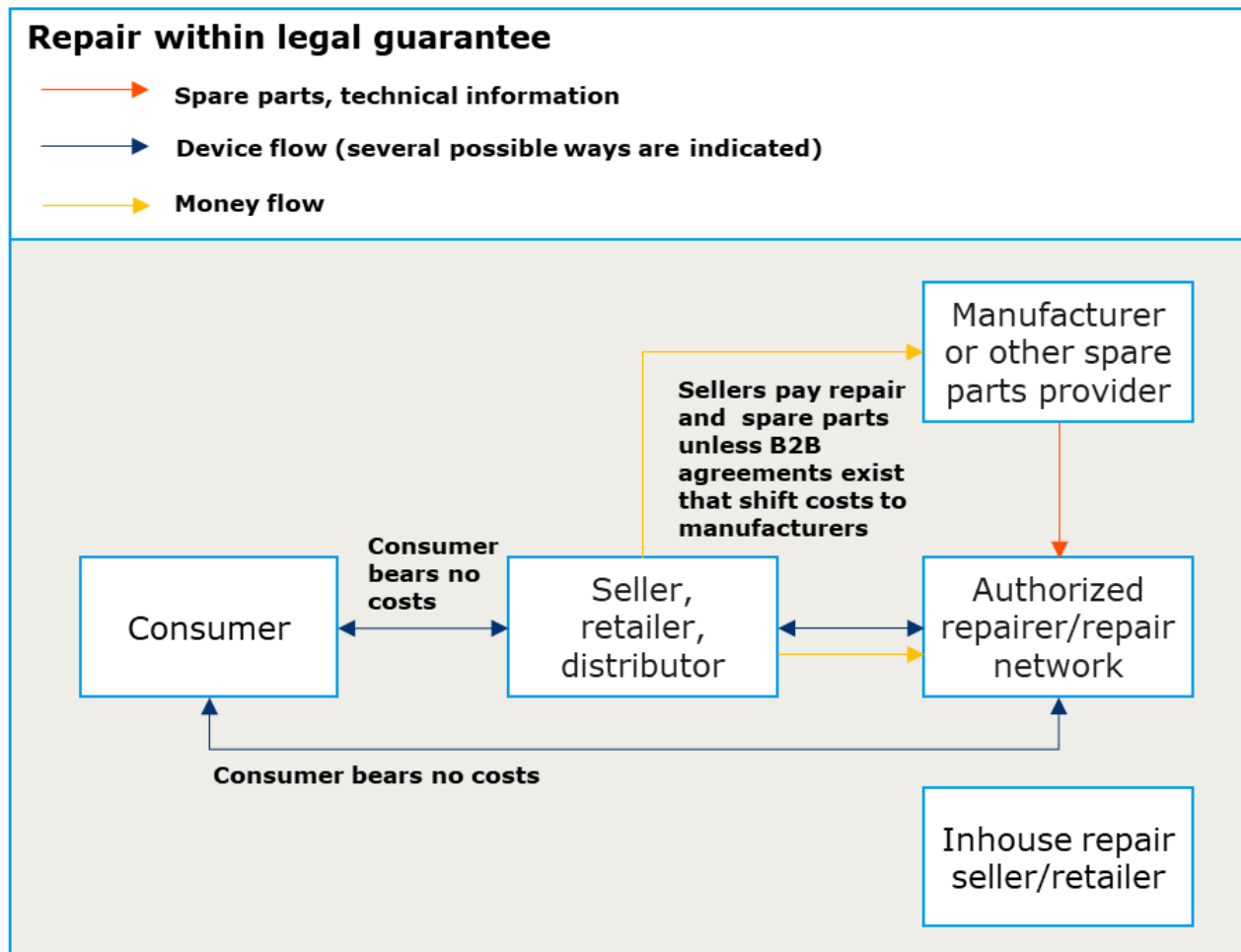
Independent repairers are not involved in repair under the legal guarantee, because the seller is the party that bears the costs of remedies under the legal guarantee (and the seller or manufacturer under a commercial guarantee). According to a stakeholder from the repair sector, some terms and conditions may state that the legal guarantee becomes void when an independent repairer repairs under the legal guarantee. Therefore, independent repairers are mainly consulted for repairs beyond guarantees. All 46 authorised and independent repairers and refurbishers surveyed indicated that they had an agreement in place with manufacturers (54%) and/or with retailers (39%) and/or another actor in the supply chain (e.g. insurance, etc) related to the handling of defective products.

According to stakeholders, a typical process when claiming a remedy for a defective product from a seller might look like this:

- As sellers are not necessarily allowed to repair a product covered by a manufacturer guarantee themselves, they need to contact the manufacturer, or the repair service appointed by the manufacturer. Before contacting the manufacturer or an authorised repairer, the seller checks all formalities with the consumer (e.g. the time of hand-over, the responsible party for the burden of proof) and records the description of the defect (with pictures if needed).
- Based on the previous steps, the seller checks whether the notice of defect is justified. If not, the seller rejects the complaint. If the situation about the defect is unclear, the seller organises an 'on-site appointment' of a service employee. In a best-case scenario, the service employee can directly eliminate the defect (e.g. if settings are missing or slight surface repairs are needed).

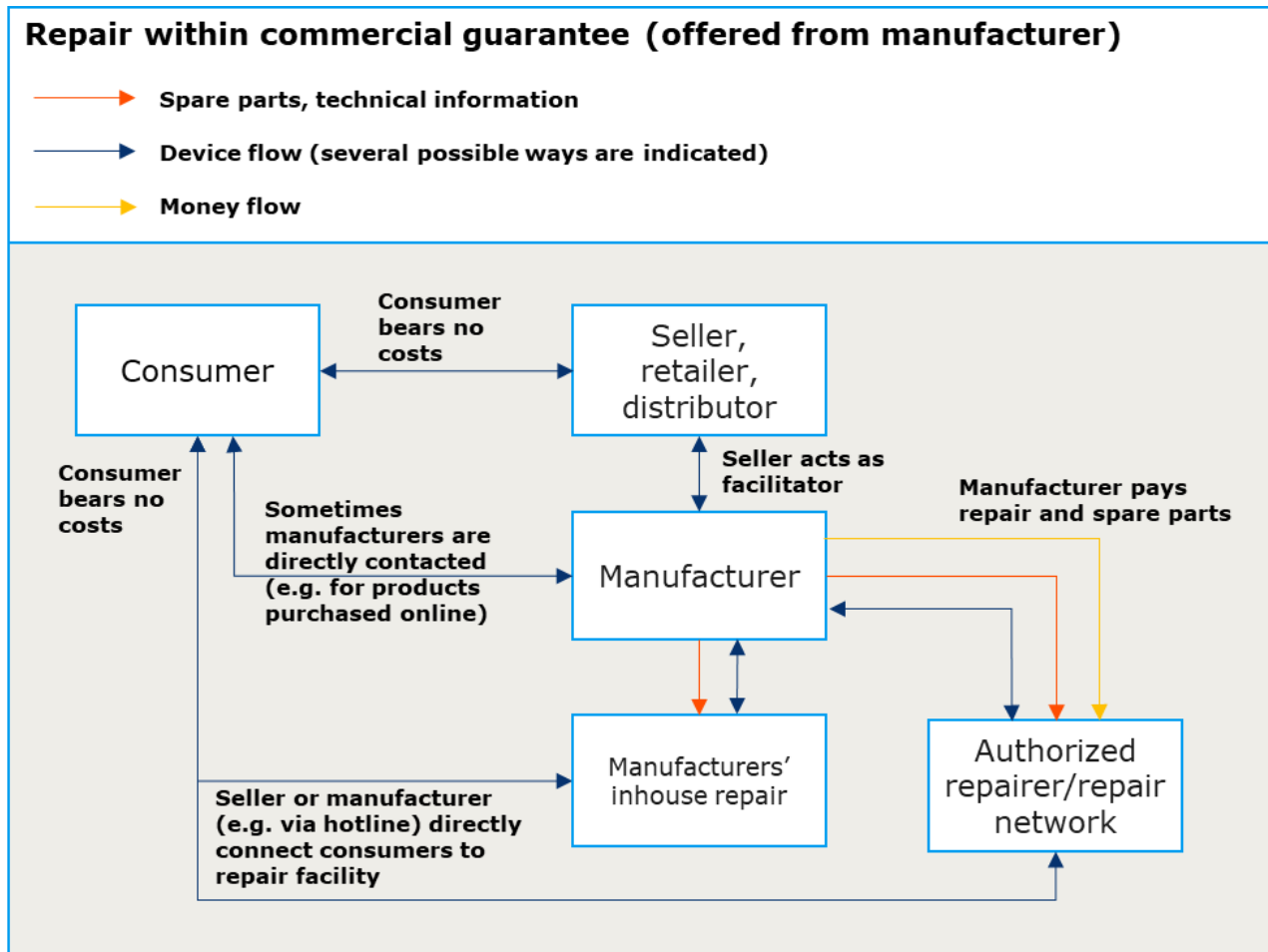
- If the complaint is justified, the seller checks whether the defect can be remedied by his/her own means or whether initial spare parts are needed. If spare parts are needed, the seller orders them from the manufacturer. If the fault lies with the consumer, the spare parts are not paid for by the manufacturer. If the fault lies with the seller, the latter might show goodwill and pay for the spare part. If the fault lies with the manufacturer, the latter pays for the whole repair.
- The seller also checks in advance whether the consumers can remedy the defect themselves with a spare part (e.g. a cover cap is missing, or an easily replaceable fitting can be replaced by the consumer). If a replacement or repair performed by the seller is necessary, an appointment is made with the consumer for the replacement or repair. In an optimal scenario, the seller will repair or replace in the context of this appointment and the complaint will be settled.
- If the seller is not able to remedy the defect, the manufacturer's customer service is requested (where available). Small products are sent to the manufacturer/its repair network by the seller, whereas larger products require an on-site visit from the manufacturer service. The seller will act as a facilitator here and accommodate the consumer to set up an appointment with manufacturers or their appointed repairer.
- Typically, sellers issue a receipt that they received the product before sending it to the manufacturer. If the complaint cannot be resolved, the steps described above are repeated in a similar manner. Some sellers provide consumers with a temporary replacement unit during the repair period.

Figure 24 - Relationship between repair actors taking care of defective products under the legal guarantee



Source: Authors, based on stakeholder consultations and ADEME (2021)

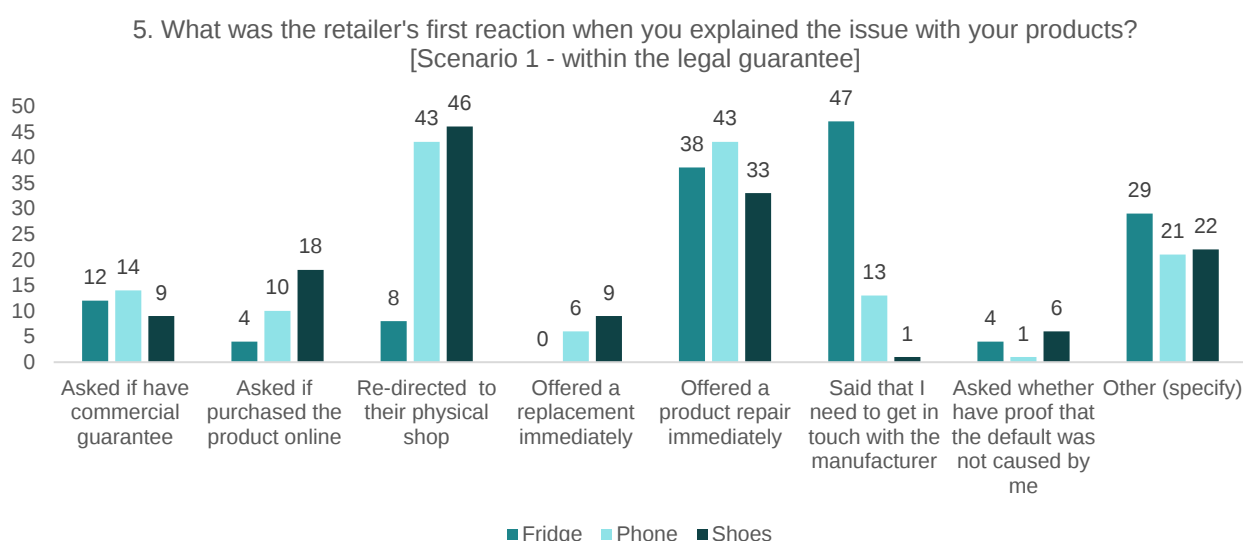
Figure 25 - Relationship between repair actors taking care of defective products outside legal guarantee but within a commercial guarantee from manufacturer



Source: Authors, based on stakeholder consultations and ADEME (2021)

In the context of this study, we carried out a telephone-based mystery shopping exercise for three selected products to verify theoretical descriptions from repair processes. The exercise was carried out in 12 countries to understand how sellers react when consumers ask for a solution in case the defects of a product become apparent within the legal guarantee. Many sellers approached offered a repair solution as a first reaction to the issue presented over the phone. This solution was mostly offered for issues linked to smartphones and refrigerators, and less for shoes. Owners of phones and shoes (products smaller in size) were redirected to the physical shops of the sellers, where a final solution would be provided. For refrigerators (products big in size), sometimes shoppers were advised to get in touch with the manufacturer, whereas some other times sellers proposed to send a technician to perform a diagnosis. Only in a few cases shoppers were asked to prove that the defect was the fault of the manufacturer, but it was often asked for shoppers to send proof of the defect to identify the issue and provide shoppers with a solution.

Figure 26 - Sellers' first reaction to the product defect per product (within legal guarantee)
(n= 600)



Source: Authors based on mystery shopping exercise among sellers from 12 EU MS

From interviews and literature research we also gained insight into an exemplary process when the consumer addresses a claim directly to a manufacturer. It was observed that consumers who buy products via sales platforms increasingly directly address the manufacturer as they no longer have a distributor interface (ADEME et al., 2018).

- As a first step the consumer turns to the manufacturer's after-sales service (e.g. a call centre), where the claim is recorded. The call centre forwards the order to the repair network, which then selects the most appropriate repair business (e.g. the one closest to the consumer). From manufacturers' websites, we learnt that alternatively consumers must fill in online forms to describe the failure. Based on this information, they are redirected to the respective repair service.
- The repair business decides if sending out a technician is necessary and if yes, makes an appointment with the consumer. For large and bulky products, it is common for a technician to go to the place where the product is placed (e.g. the consumer's house). The repair business decides if a repair is economically viable or if a replacement should be preferred. The decision must be justified and reported to the manufacturer.
- When replacement is the preferred option, the consumer is asked to return the product to the sellers' shop where he/she will get the new product.

As shown in the exemplary process, many manufacturers have set up networks of contracted partners to perform professional repair within the legal or commercial guarantee. As only a few manufacturers still offer in-house repair and most manufacturers no longer have workshops and service technicians, they subcontract repairs to their repair network of technical stations or to industrial repairers. The contracted repairers get a licence from the manufacturer. Consumers might send their defective device to the manufacturers, who in turn send it to the contracted repairer. Alternatively, the consumer can be instructed to directly send the device to the contracted repairer. If manufacturers offer in-house repair, they typically operate one centralised repair centre. However, it is not excluded that manufacturers operating their own repair centres also employ subcontractors. A major

disadvantage of centralised repair centres is long transport distances to the respective seller or consumer, which leads to a long time needed to repair, which weakens the consumer's willingness to repair. Currently, some manufacturers need 6-8 weeks to complete a repair.

The mystery shopping that was conducted within this study confirms that different repair options exist (see figure below). For example, the most offered repair solution for smartphones and shoes was to take the product back to the shop where the repair could be carried out when the shop has a licence from the manufacturer. Otherwise, the product is sent to the manufacturer or an affiliated repair network. In the case of refrigerators, there were numerous solutions offered. In many cases, sellers said that technicians would be sent to repair the issue or perform a diagnosis and then offer a solution. Another solution offered was to return the product to the manufacturer directly.

Figure 27 - Repair options offered under legal guarantee (n = 600)



Source: Authors based on mystery shopping exercise among sellers from 12 EU MS

Spare parts provision under the legal guarantee

Legally, the seller is liable for the repair under the legal guarantee and bears the costs, including for any spare parts. According to an interviewee from the repair sector, the prevailing market practice is to enter into B2B agreements in which the seller and the manufacturer agree that the costs for spare parts are passed on to the manufacturer. According to the same stakeholder, it is also common practice that repairers who have an agreement with manufacturers are often forced to pre-finance the spare parts they need for repair. After a given period (often on a monthly basis), the repairer can invoice the installed spare parts to the manufacturer to get the expenses reimbursed. In the same interview, it was mentioned that the repair workshop can only charge for the spare parts that are absolutely necessary for a repair, so it may not be possible to charge the manufacturer for all parts purchased in advance. This tempts repairers to replace not only broken parts with spare parts, but also parts that are likely to break soon. In this way, repairers can charge manufacturers for more of the pre-financed spare parts.

An interviewee from the repair sector stated that another reason for using more spare parts than absolutely necessary is the responsibility of the workshops towards the manufacturer:

if another damage occurs to the same product after a repair, the workshop has to pay for the consumer's second visit for diagnosis and/or repair. This is irrespective of whether the second fault is related to the original repair. To avoid a second repair, it is likely that, while performing the first repair, the repair business will already replace parts that may break soon. Although repairing under the legal or commercial guarantee puts a lot of pressure on repair businesses, several repairers offer repair under the legal guarantee to have easier access to original spare parts. In the network of the cited stakeholders, around 15% of the repair businesses offer repair within the legal guarantee.

Costs coverage for repair under the legal guarantee

As described above, B2B arrangements that shift the costs from sellers to manufacturers are a common practice. In these cases, manufacturers pay the labour and the spare parts for the repairing activity of a defective device. They also take over travel and shipping costs related to the product claim. In these cases, if a defective product brought to the seller is clearly covered by the legal guarantee, the seller takes over the costs of the repair, but the manufacturer reimburses the costs. In these situations, sellers therefore act as facilitators and connect the consumer to the manufacturer. The seller's costs for administration or communication with the client are normally not compensated, but sellers offer this service in order to increase consumer loyalty.

4.2.2. Repair outside the legal guarantee

Within the current legal framework, consumers have limited options to get a product repaired for free by sellers or manufacturers if defects become apparent beyond the legal guarantee period. Therefore, consumers can either acquire a commercial guarantee which gives additional protection outside the legal guarantee or pay for the repair themselves. It seems to be a common practice in several industries to give (or sell) commercial guarantees to consumers including specific support (e.g. FAQs for repair), repair or replacement options. As free-of charge commercial guarantees were already included in the previous section as they heavily overlap with the legal guarantee, this section only includes commercial guarantees for an extra cost. Purchasable commercial guarantees offered by manufacturers, sellers or insurances often entail an extended guarantee period.

According to a consumer survey conducted by Ipsos et al., 22% of EU28 citizens have purchased a commercial guarantee at extra cost when buying a product in the last three years. The same study reveals that 30-40% of electronic devices, cars and household appliances are covered by a commercial guarantee. Only 10% of shoes and clothes are covered by a commercial guarantee. However, it is not stated whether these guarantees are included in the price or whether they can be purchased optionally for an additional charge (Ipsos et al., 2015). Another study confirms that household products (40.5% of respondents), electronic devices (36.6%) and vehicles (12.5%) are typically those products for which commercial guarantees are purchased (ECC, 2020). The same study states that in about 60% of online offers checked, a reference to a commercial guarantee was made (ECC, 2020). Another question within the consumer study conducted by Ipsos reveals that 61% of respondents who had bought a product with a commercial guarantee replied that this guarantee offered an extended guarantee period. 22% of the respondents stated that the guarantee offered additional services (such as repair at home) and 24% bought an

Beyond the commercial and legal guarantee, only a limited number of manufacturers provide spare parts, after-sales services or information (Deloitte, 2016). According to a stakeholder experience, several manufacturers' hotlines are often no longer available when the device is out of guarantee. This gives rise to the suspicion that some manufacturers are not interested in offering repair services beyond the legal or commercial guarantees. This is surprising, as beyond the guarantee the consumer bears the cost of the repair. However, several manufacturers' websites were discovered that display links to repair centres for out-of-guarantee products.

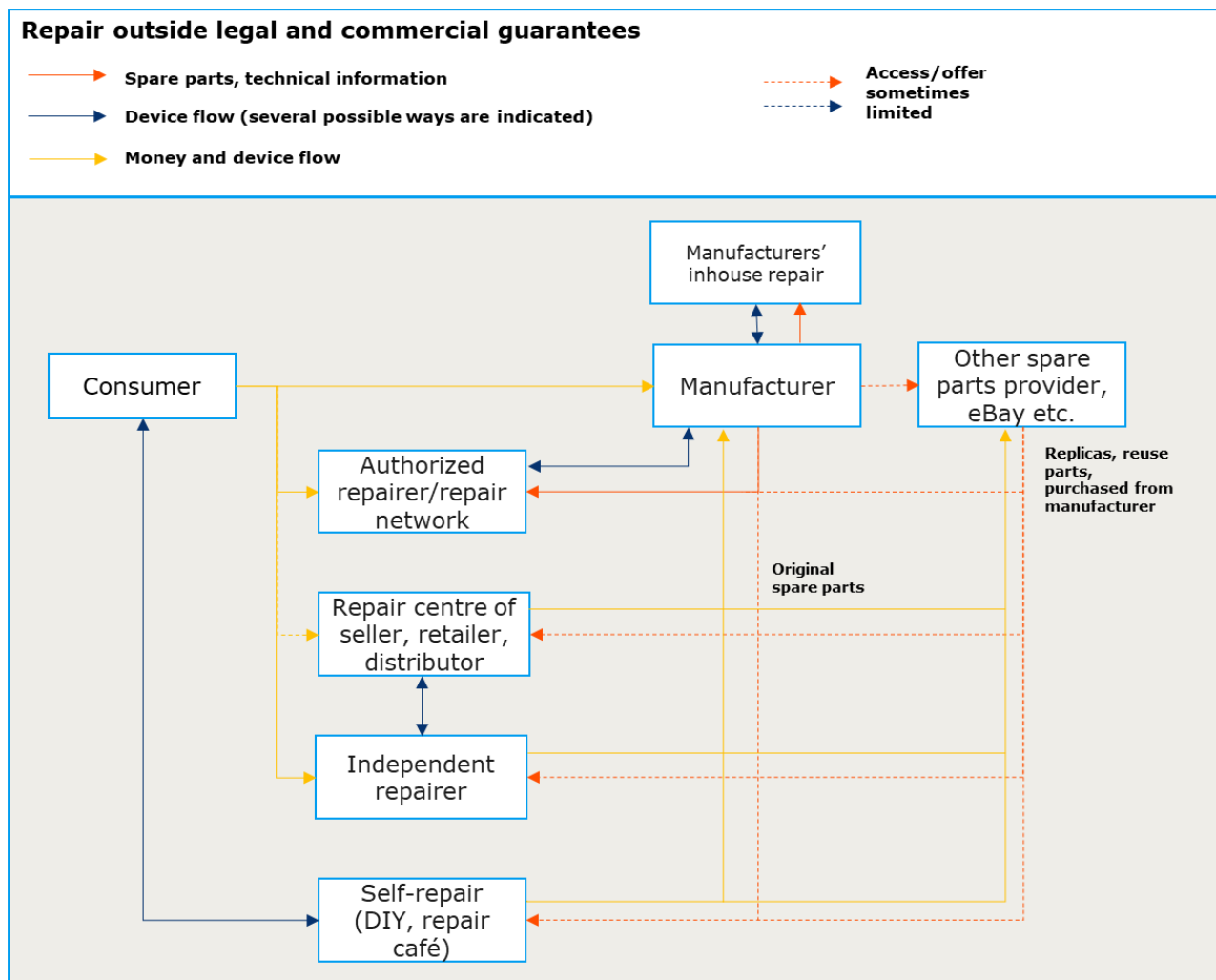
In the business survey, 38 companies (manufacturers and sellers of new goods only) indicated that when the products fall outside of the legal guarantee, they recommend a third-party repair service to the client that the consumer pays for. The type of business (manufacturer, seller of new goods/second-hand/refurbished goods) had no impact on the practices. However, these results should be interpreted with caution given that the number of responses is not representative.

As displayed in the figure below, after the legal guarantee has expired, new actors come to the repair stage. In addition to manufacturers, sellers and contracted repairers, independent repair actors are active to provide repair services to consumers outside the legal guarantee. According to stakeholders, the number of independent workshops greatly exceeds the number of manufacturer workshops. All 45 authorised and independent repairers and refurbishers surveyed indicated that they had an agreement with manufacturers (56%) and/or with sellers (40%) and/or another actor in the supply chain (e.g. insurance, etc.).

Moreover, self-repair and spare parts providers (i.e. companies that specialise in selling spare parts) become relevant for repair outside the legal guarantee. While sellers usually do not perform repair themselves for products under the legal guarantee or under the manufacturer's commercial guarantee, they might have their own repair centre to enable repair services beyond the guarantees. The repair and the direct support service are economic opportunities for sellers. According to the stakeholder input, many independent workshops are affiliated with a specialised seller. In France, for example, food superstores selling consumer goods subcontract repair services to independent repairers, industrial repairers, or national repair networks, as many no longer have the necessary skills in-house. A stakeholder confirms that repair networks get repair orders outside the legal guarantee mostly via sellers or via online requests from consumers. Normally, a repair is carried out in the workshops of repair networks, but for rare or particularly complex repairs specialised companies (e.g. SMD circuit board repairs, hi-fi, etc.) are used.

Within the last few years, repair cafés have emerged as an additional actor contributing to self-repairs. In a repair café volunteers help other citizens to repair their broken devices (e.g. during a repair event). However, repair cafés do not intend to be competitors for professional repairers but rather to enable more repair. According to a stakeholder, most repair cafés are rather averse to risk (e.g. with handling higher voltage devices) and transfer products that need more complex repair to a professional repairer. It is also common that different platforms and service providers are contributing to repair, for example by facilitating the transfer of information (Deloitte, 2016).

Figure 29 - Relationship between repair actors taking care of defective products outside legal and commercial guarantee



Source: Authors, based on stakeholder consultations and ADEME (2021)

Hence, the consumer usually has four possible courses of action when faced with a broken product outside the legal guarantee period:

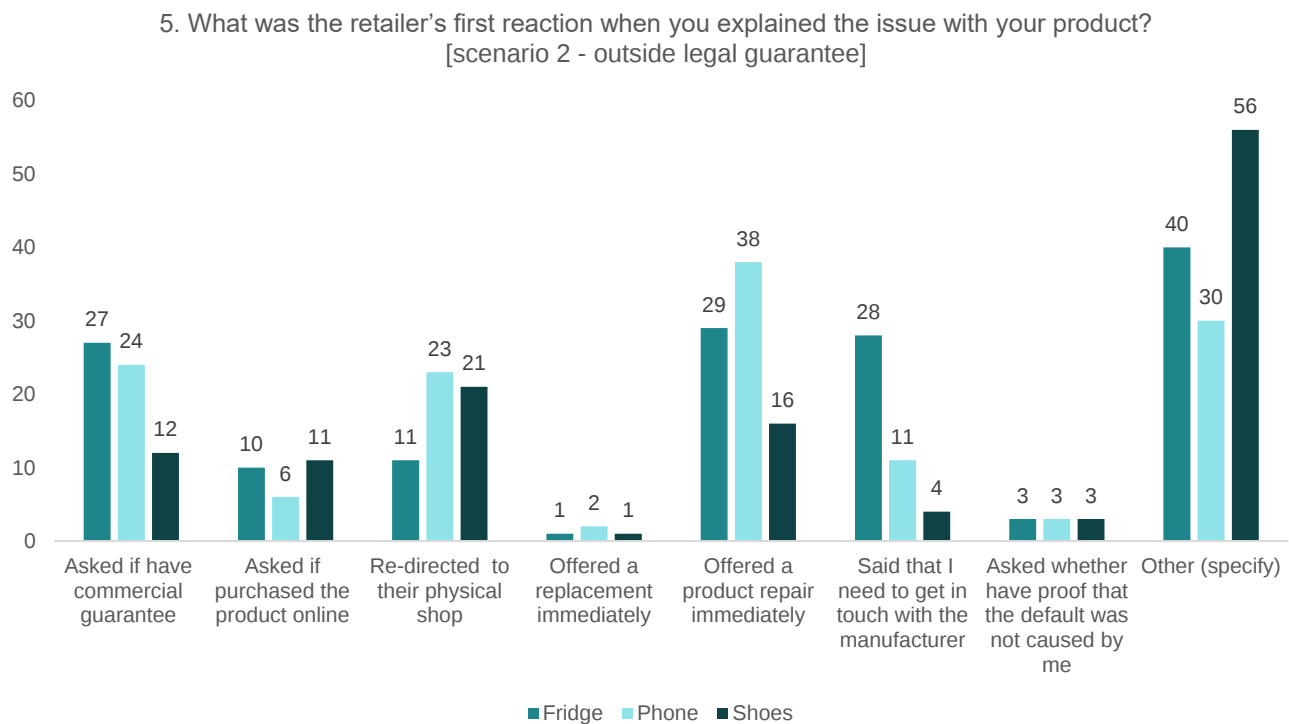
- Consult the seller or manufacturer or their repair divisions or contracted repair service provider;
- Seek out an Independent Repairer;
- ‘Do-it-yourself’ (DIY), self-repair (e.g. repair cafés);
- Dispose of the broken device and purchase a replacement product if necessary (Svensson-Hoglund et al., 2021).

The consumer survey revealed that 37% of the surveyed product owners that had their defective product repaired got it repaired in a local repair shop. Self-repair, repair help from friends or repair cafés were the least frequently reported. The most important reason to choose the respective repairer was trust in the quality of the repair. Other reasons highlighted were that the repairer was close, convenient to reach and cheap. The fact that it took little time to carry out the repair was indicated as reason to choose the repairer from product owners from all product groups. The favourite repair places were the same for all products selected for this study (i.e. local repair shop always favourite one).

Because the retail is important in the context of repair beyond the legal guarantee, it was studied in more detail. The mystery shopping exercise carried out for this study tested the

sellers' reactions to consumers' defective products outside the legal guarantee. When this situation was presented to the sellers, they asked if the consumers had a commercial guarantee (most frequently for refrigerators and smartphones) and then offered to repair the product directly (if the commercial guarantee was mentioned). Issues raised for refrigerators were dealt with slightly differently compared with the other two products under analysis, probably due to their size. Hence, sellers advised shoppers to get in touch with the manufacturer for repair or asked shoppers to pay themselves for repair.

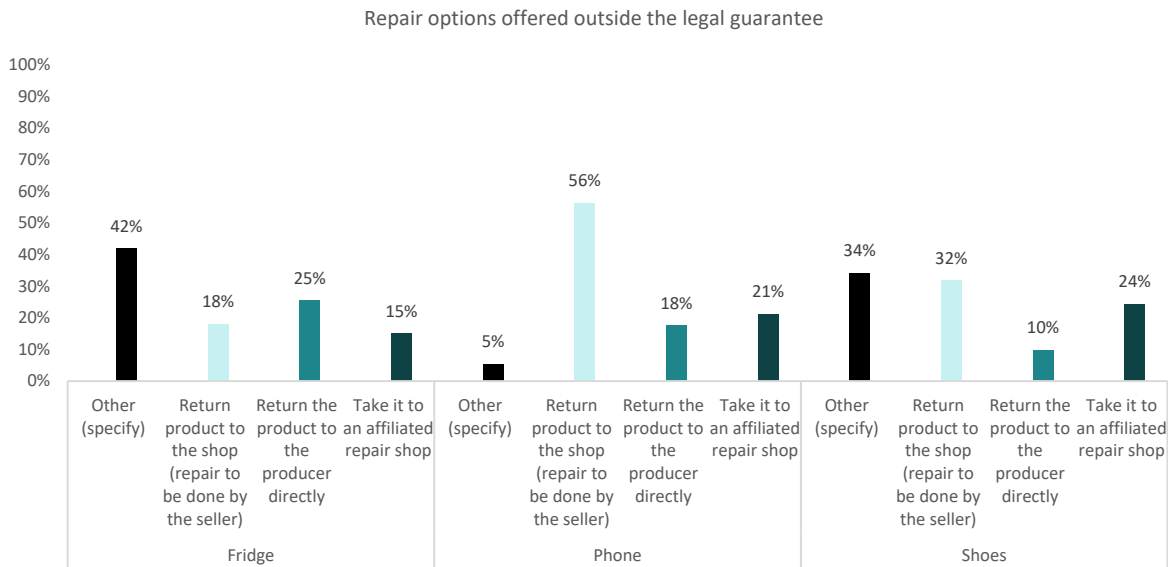
Figure 30 - Sellers' first reaction to the product defect per product (outside legal guarantee) (n= 600)



Source: Authors based on mystery shopping exercise among sellers from 12 EU MS

When a repair option was offered outside the legal guarantee, shoppers were redirected to non-affiliated repair shops for issues related to refrigerators and shoes (e.g. cobblers for shoes) where the repair would be done at the consumer's cost. For issues related to refrigerators, consumers were advised to get in touch directly with the manufacturer. Shoppers were provided with a solution (including repair) only if the shoppers claimed to have a commercial guarantee. This was not the case for shoes, for which acquiring a commercial guarantee is not a frequent practice. Shoppers also reported that sellers offered online/phone diagnosis or asked for an order number (i.e. proof of purchase) (included under 'other' in Figure 31). Other shoppers were advised by the seller to find a shop to repair the defective product at their own cost (included under 'other' in Figure 31).

Figure 31 - Repair options offered outside the legal guarantee (n= 600)



Source: Authors based on mystery shopping exercise among sellers from 12 EU MS

The results of the mystery shopping show only a partial picture of the relationship among market actors in the value chain as the research was only carried out among sellers. For larger products, such as refrigerators, sellers either place the responsibility on the manufacturer or arrange repair at consumers' premises, probably by using third-party suppliers or through arrangements with the manufacturers. For smaller products such as shoes and smartphones, sellers arrange repairs within their physical shops with no involvement from the manufacturers. Taking products to affiliated repair shops was not a solution offered very frequently.

When looking at the sellers' reactions by a company size, we noticed that large companies are more inclined to offer repair solutions compared with smaller companies. This could be explained by the fact that large chains have embedded repair solutions or have agreements with third-party suppliers to which consumers could be redirected.

Spare parts provision outside the legal guarantee

With regard to spare parts, the relationships between the actors get more complicated outside the legal guarantee. According to stakeholders from the repair sector, usually, independent repairers and consumers doing self-repair have no connection to the manufacturer and hence no exclusive access to spare parts. They can of course try to buy spare parts from manufacturers (e.g. via the manufacturer's websites offering spare parts), but many times the requested spare parts are not available or too expensive. Hence, independent repairers rely on other spare parts sources, for example on third-party distributors offering non-generic spare parts. An interviewee stated that these distributors might have grey contracts with manufacturers or have facilities in Asia.

However, no data could be collected on these activities. There are licensed spare part suppliers and independent spare part suppliers from the EU or China. Another way to get

spare parts is to buy reused parts (e.g. on swap meets like eBay). Repair Cafés sometimes collect their own spare parts (e.g. screens from donated iPhones, components detached from circuit boards)⁸³. However, the quality and reliability of these spare parts is uncertain. According to a stakeholder from the repair sector, authorised workshops usually receive cheaper spare parts than independent workshops. However, the current (2022) smartphone repair market in the US shows that prices for spare parts in the market for independent repairers are 5-10 times cheaper than spare parts from manufacturers. It is said that some manufacturers use the sale of spare parts outside the legal guarantee to finance repair work within the guarantee.

An interviewee from the repair sector mentioned that authorised repairers and contracted repair networks have better access to original spare parts. Moreover, they get the spare parts at a cheaper price. However, they do not necessarily pass on the cost reductions to the consumers. Several authorised repairers use third-party spare parts (e.g. via the distributor ASWO⁸⁴) in order not to burden consumers with too high costs. According to stakeholders, the easier access for authorised/contracted repair businesses to spare parts is one major reason why there is no level playing field for independent repairers. An example from Ford Company in 1920 shows that sellers and repair shops have been organised for a long time in networks to avoid competition on repair prices with independent outlets. Only certified shops received repair parts from Ford and repairs were only possible by using special tools supplied exclusively to certified shops (Hatta, 2020).

If sellers have their own repair centre, they are faced with similar challenges with regard to spare parts as other independent repairers. Due to existing business contacts with manufacturers, they might have easier access to original spare parts. However, manufacturers will always privilege their own (or contracted) repair centre and not necessarily consider the demand of independent repair centres (including sellers). Usually, actors performing repair give a guarantee on their repair service and/or the replaced or repaired part of the defective product. If a new spare part was used, the part has a legal guarantee itself.

Costs coverage for repair and competition outside the legal guarantee

Outside the legal guarantee, the consumer must bear the cost of the repair. Hence, high prices for spare parts or high repair costs in general might discourage the consumer from carrying out the repair. Manufacturers have fewer incentives to offer cheap repair, as the incentive to sell a new product is greater. From stakeholders we understood that independent repairers often offer repair cheaper than manufacturers or contracted parties (e.g. in the case of smartphones), although they cannot always guarantee the use of original spare parts to the consumer. An example of an iPhone shows the huge price difference between OEM and non-OEM parts: An average screen repair can cost EUR 80-300. If the spare part is a non-OEM part, the spare part cost accounts for 20% of the whole repair price. The remaining 80% corresponds to labour cost. When using an OEM spare part, the cost of spare parts amounts to a share of 60-70% of the total repair cost, so 40-30% represents the labour costs. Assuming that the labour costs are similar in both cases, a repair with an

⁸³ Spare parts inventory list of Repair Café Malmö: <https://www.repaircafe.nu/parts/>.

⁸⁴ ASWO. Accessed 03.02.2023. <https://de.aswo.com/>

original spare part is significantly more expensive (the cost data is derived from input from a stakeholder).

The business survey gives an indication that, in the case of mobile phones, independent repairers and refurbishers indeed have lower average repair costs than authorised repairers. As the response base is very limited, we cannot give concrete numbers on the average cost. Repair costs within refurbishment of a phone amount to around EUR 96, whereas retailers of new goods indicate a repair cost of around EUR 112.

In the business survey, the respondents indicated that spare parts tend to represent about a third of the overall repair costs (alongside diagnosis, labour costs and transport). In particular, the proportions varied from 17% of the repair cost for wooden furniture and 53% for TVs. The consumer survey indicates that across all examined products (cars not included) the total repair cost is around 30% of the original purchase price. The repair costs for cars are around 20% of the original product price.

The mobile phone market is a good example of a growing repair market and shows that repair from independent repair shops can be successful: According to Türkeli et al. (2021), in recent years, there has been a shift from official brand shops and non-official shops for repair to independent repair shops. Mobile phone users started to take their phones more and more to newly created independent shops as the repair was done quickly and for lower costs than the costs offered from suppliers working for official brands. Several factors seem to explain why independent repairers have been able to develop strategies to be competitive and offer higher consumer value: low barriers to entry, local presence (i.e. direct contact with consumers), expertise, links to global upstream and downstream suppliers, relatively low prices for repair quotes and the sale of additional accessories and services to consumers (Türkeli et al., 2019). However, according to a study conducted in the U.S., authorised repairs are perceived as advantageous with regard to certain categories, namely 'quality of parts', 'quality of workmanship' and 'professionalism/courtesy'. In the categories 'convenience' and 'repair costs,' independent and authorised repairers reached similar grades (Waddell, 2022). It is unclear to which extent these data can be applied to the EU market.

According to Wisemann et al., concerns regarding quality and skills of independent repairers are excuses that deter true competition and regulation of quality and costs. The authors suggests that creating a level playing field for independent companies to match the quality and cost of repair work would benefit consumers (Wiseman et al., 2020). Several stakeholders claimed as well that spare parts are too expensive and disproportionate to the original costs of the product. Moreover, the lacking availability of spare parts contributes to lacking repair supply and demand. The stakeholders added that the purchase price of spare parts is not uniform across the EU, which might lead to a fragmentation of the internal market.

4.2.3. Reasons for replacement or refusing repair across stakeholders

From the research conducted it can be inferred that attractive options for consumers to choose to repair outside the legal guarantee are limited. Many manufacturers and sellers only offer repair services when the consumer obtained a commercial guarantee. According to stakeholders from the repair sector, manufacturers control the access to original spare parts and to repair guides, making independent or self-repair challenging. While under the

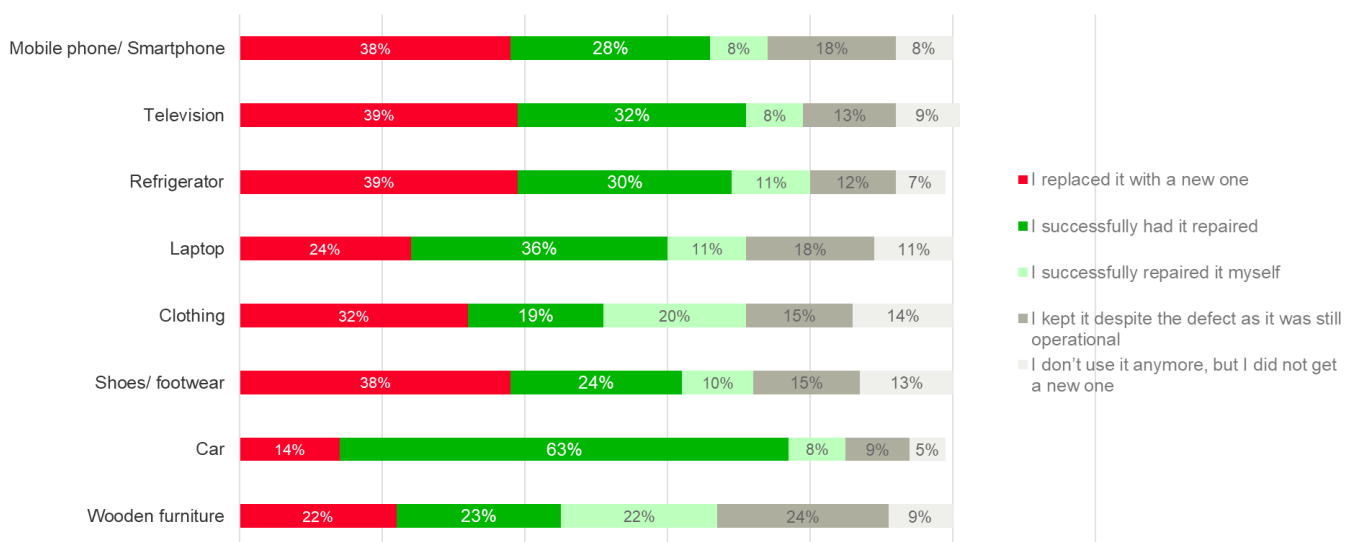
legal guarantee the manufacturer or contracted partners make decisions about worthiness of repair, outside the legal guarantee this decision is made by the consumer as he/she must bear the costs of repair. In the following it is shown that on the one hand consumers perceive repairs as too expensive, but on the other hand manufacturers and sellers also negatively affect the consumers' repair requests.

Consumer's refusal of repair

Outside the legal guarantee the consumer is faced with the decision for or against repair, as it is the consumer who must bear the repair costs. The reasons why consumers prefer replacement over repair are already reflected on in the first part of the study (see chapter 3 and 4 containing the problem definition). Exemplary reasons to decide against repair are lacking and expensive spare parts and repair guidelines (to be provided by manufacturers); the time needed to repair the defective product or possible gaps in efficiency (e.g. energy consumption) when keeping and repairing the 'old' device and several behavioural arguments described above. The consumer survey carried out for the purpose of this study shows that across all product groups the most frequent reason for not having a product repaired was that 'the repair was too costly'.

The consumer survey also revealed that product owners who experienced defects take different repair/replacement decisions for different products. In the case of mobile phones/smartphones, TVs, refrigerators, and shoes, around 40% of product owners decided to replace. Cars were rarely replaced or repaired by the consumers themselves but repaired by an external party. In general repair by an external party seems more attractive than self-repair. Only clothing and wooden furniture score at least 20% in 'I successfully repaired it myself'. Interestingly, depending on the product, between 9% and 24% of respondents kept the product despite the defect (if it was still functional), i.e. they neither had it repaired nor replaced.

Figure 32 - What happens with defective products



Source: Authors based on consumer survey exercise

Another reason for replacement might be recurring defects. In the consumer survey, product owners who had their defective products repaired were asked if the same defect reappeared after the repair. Across the products (cars not included), in 65% to 77% of the cases the defect did not occur again. However, in 7% to 14% of the cases the defect reappeared directly after the repair and in 14% to 21% of the cases it recurred sometime after the repair. Only with cars the recurrence rate was lower: In 85% of the cases the defect did not recur. However, the data give no indication about whether the defect reappeared due to lacking quality of the repair services, due to (another) misuse of the client or due to any other reason.

Seller's refusal of repair

According to several stakeholders, replacement is often preferred over repair as it is more convenient for the seller or the manufacturer. The decisions for replacement and against repair are typically based on these factors:

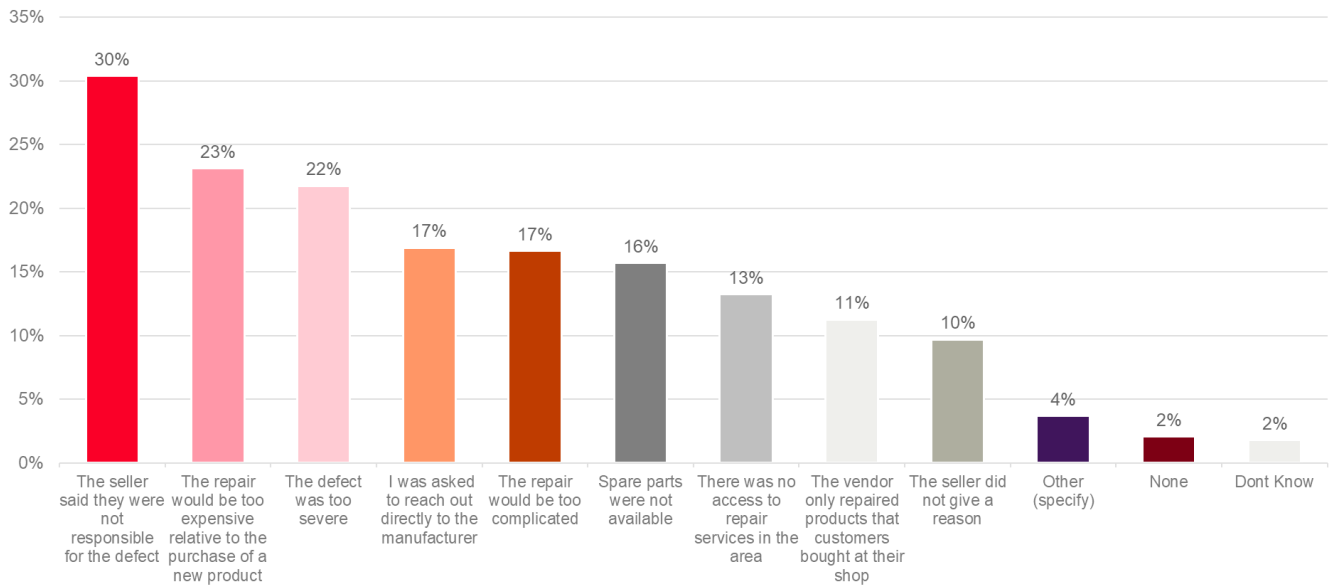
- The price and availability of spare parts;
- The price of repair; and
- The price of the original product.

Other factors, such as the transportation logistics, can also justify such a refusal. In the furniture industry, for example, replacement is easier as it requires only one journey (when delivering the new product), whereas repair requires at least two journeys (picking up and return) with at least two handlers able to carry bulky furniture. Other stakeholders agree that on-site repairs are expensive as travel costs and longer working hours associated with the journey need to be added.

Although costs still seem to be a major decisive criterion, stakeholders emphasise that the decision for/against repair is always a case-by-case decision. Apart from the costs, sellers often opt for the choice which allows the fastest help to the end-consumer. In that regard, the lengthiest repair times were observed for shoes and wooden furniture (12 days), compared with 3 days for a smartphone. The impact of delays can also vary in significance depending on the item. For example, the absence of a car, fridge, or cell phone, even for a short period, can be more cumbersome than a piece of clothing.

The consumer survey revealed that, among all product owners that experienced a defect, 57% did not have a defective product repaired. Conversely, 31% reported having it successfully repaired and 12% managed to successfully repair it themselves. Among those who did not have the product repaired, 8% reported that the seller refused to repair the product. The consumer survey asked product owners with defective products for which the seller refused a repair why sellers refused said repair. The high response rate for the statement 'the seller said he was not responsible for the defect' indicates that in many cases the defect was not a guaranteed case or was otherwise covered by an additional commercial guarantee for which the manufacturer is responsible. Next to this answer, 'the defect was too major', 'spare parts were not available', 'the repair would be too expensive relative to the purchase of a new product' and 'the repair would be too complicated' were typical answers of sellers.

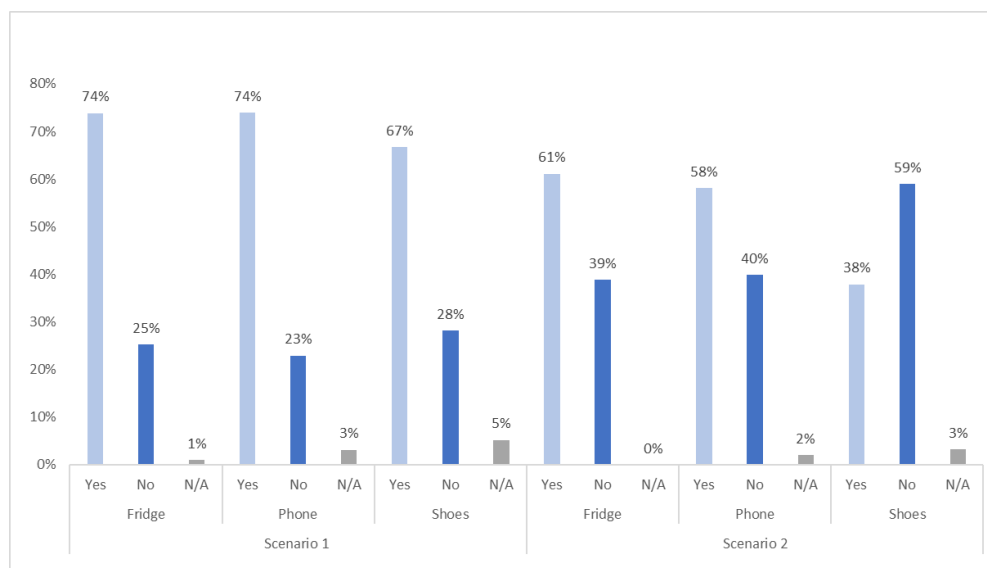
Figure 33 - Seller refusal for repair under legal guarantee



Source: Authors based on consumer survey exercise

The mystery shopping carried out in the context of this study assessed a similar question to the consumer survey. It was asked whether, by the end of the observation, the shoppers were offered with a repair solution. Under the legal guarantee (scenario 1), more than 70% of the sellers selling fridges and phones proposed a repair solution, while around 67% of those selling shoes offered one. However, outside of the legal guarantee (scenario 2), the results show that 61% of sellers selling fridges proposed a repair solution. However, around just 38% of sellers for shoes and 58% for phones offered a repair solution. Overall, in both scenarios the number of sellers offering a repair solution is quite positive. In scenario 2, some of the shoppers mentioned a commercial guarantee at the beginning of the call which might have impacted the number of sellers that offered a repair solution outside of the legal guarantee.

Figure 34 - Extent to which shoppers were offered with a repair solution within (scenario 1) and outside the legal guarantee (scenario 2)



Source: Authors based on mystery shopping exercise among sellers from 12 EU MS

The main reasons invoked in the mystery shopping for not offering repair are: the product is not repairable, defective products should be taken to an affiliated repair shop, defective products should be taken to a local repair shop and pay at the shopper's own expense for the repair, the shop does not offer repair, should contact the manufacturer because it is not the seller's responsibility, the product is no longer under the guarantee and it is not their responsibility to undertake the repair.

Moreover, the results of the mystery shopping showed that many sellers offered a repair option (they do not necessarily repair items themselves but act as a facilitator) outside the legal guarantee (depending on the product in 38% to 61% of the cases). For all product categories the repair offer under the legal guarantee was significantly higher than outside the legal guarantee.

Stakeholders claim that, if sellers are involved, they quickly offer replacements as a gesture of goodwill to increase consumer satisfaction. Hence, the consumer is not incentivised to further ask for repair. Nonetheless, repair services can be a business opportunity for sellers.

Manufacturer's refusal of repair

It was reported that manufacturers only offer limited repair services outside the legal and commercial guarantee (although the consumer pays for it). If a manufacturer offers a repair outside the guarantees, they might charge high prices to cross-finance repairs under the legal guarantee. Hence, the consumer might be deterred from the high repair price. According to stakeholders, manufacturers focus on new products and have no incentive to offer repairs outside of guarantees.

Independent repairers

Independent repairers do not refuse repairs but might be unable to perform a requested repair (e.g. if they cannot access needed spare parts or a relevant repair guide). Moreover, some consumers might distrust non-OEM parts or independent repairers in general as they are not formally 'authorised'. Some stakeholders claimed that independent workshops are less visible in public life and therefore less in the consciousness of consumers. On the other hand, the consumer survey showed that, when deciding on repair, most consumers choose a local repair shop.

4.2.4. What happens with replaced goods

When it comes to replacement, the manufacturer, seller, repairer, or consumer is faced with either disposing or reusing the non-repaired good.

The results of the mystery shopping carried out in the context of this study show that most sellers do not collect or recycle defective products. This is particularly problematic for shoes, where in 88% of observed cases sellers did not collect or recycle. The situation is slightly better when it comes to fridges and phones, where in 39% of observed cases (respectively) sellers offered these remedies.

Stakeholders mentioned that there are some companies that do not dispose of replaced equipment but reuse or refurbish it, but significant data could not be identified. However, it is legally not possible to replace a broken product which is under the legal guarantee with a refurbished product, as such a product is not the same as the one originally purchased. It is nevertheless possible to refurbish/reuse a replaced good and resell it as a refurbished/reused product. According to one stakeholder's estimation, repair companies might use components of non-repaired products for other repairs.

According to the European Waste Electrical and Electronics Equipment (WEEE) Directive⁸⁵, WEEE need to be separately collected and treated in accordance with the European waste hierarchy. Several EU MS have producer responsibility organisations (PRO) that are responsible for the proper collection and recycling of electrical devices, i.e. sellers and manufacturers dispose of replaced mobile phones within these existing WEEE collection schemes. Since sellers with a certain size of shop space are obliged under waste legislation to take back WEEE, they already have structures in place to collect and hand over WEEE to disposal companies. Replaced electronic products are then given to the same network, which will carry out obligatory recycling.

Based on several interviews, we expect that most sellers and manufacturers dispose of wooden furniture that was not repaired but replaced as commercial waste. As the most popular way of dealing with waste wood is energy recovery and recycling (Borzecka, 2018), it is likely that this is the fate for wooden furniture as well. A stakeholder from a furniture seller association confirms that furniture that was returned by the consumer and that cannot be used anymore is transferred to bulk waste.

⁸⁵ <https://eur-lex.europa.eu/legal-content/DE/ALL/?uri=celex%3A32012L0019>.

Following this logic, cars might be discarded according to the (ELV) Directive⁸⁶. Shoes, footwear, and clothing are presumably seen as household waste and incinerated or landfilled. However, if the defective product is never sent/brought to the seller or the manufacturer (e.g. when an online diagnosis leads already to a repair refusal), the consumer needs to discard the product him/herself. We assume that the usual disposal structures of the respective country are also used here (e.g. recycling centre, bulky waste, household waste etc.). Alternatively, a defective part can be sold second-hand.

4.3. Scale and development of repair services sector

Status quo of repair services sector

At EU27 level, data on repair can be found in the Eurostat statistics for the non-financial business economy from 2018. The non-financial business economy includes the sectors of industry, construction, distributive trades, and services. In the statistical classification NACE Rev 2 Division 95, repair-related data is included in the category 'Computer and personal and household goods repair statistics' (Eurostat, 2021b). Information on car repair activities can be found in the dataset G.45.2 Maintenance and repair of motor vehicles. The following table (Table 27) shows the connection between the statistical classification and the products selected for the purpose of this study. The category 'repair of computer and personal and household goods' is composed of 'repair of personal and household goods' and 'repair of computers and communication equipment'.

Table 27 - Connection between the statistical classification NACE Rev 2 Division (Eurostat, 2021b) and G45 and the products selected for the purpose of this study.

S95 - Repair of computer and personal and household goods (terms according to Eurostat NACE Rev. 2)	Products selected for the purpose of this study
95.1 Repair of computers and communication equipment	
95.11 Repair of computers and peripheral equipment	Laptops
95.12 Repair of communication equipment	Mobile phones
95.2 Repair of personal and household goods	
95.21 Repair of consumer electronics	TVs
95.22 Repair of household appliances and home and garden equipment	Refrigerators
95.23 Repair of footwear and leather goods	Shoes/footwear
95.24 Repair of furniture and home furnishings	Wooden furniture
95.25 Repair of watches, clocks, and jewellery	-
95.29 Repair of other personal and household goods	Clothing
G.45.2 Maintenance and repair of motor vehicles	
G45.20 Maintenance and repair of motor vehicles	Cars

As displayed in Table 28, the sector for the repair of computers and personal and household goods accounted for 0.3% of the total employment in the EU27 in 2018, which is equivalent to 359,500 people employed in this sector (Eurostat, 2021b). The repair and maintenance sector for motor vehicles employed around 1,3 million people. In absolute terms, around 188,800 enterprises were operating with the repair of computers and personal and household goods as their main activity in the EU in 2018 and 452,830 enterprises were active in repairing and maintenance of motor vehicles. The sector for the

⁸⁶ Directive 2000/53/EC of the European Parliament and of the Council of 18 September 2000 on end-of life vehicles: <http://data.europa.eu/eli/dir/2000/53/2020-03-06>.

repair of computers and personal and household goods generated EUR 8.5 billion of value added, which was 0.1% of the non-financial business economy total. Compared with the value added, the level of turnover (EUR 24 billion) is relatively low (Eurostat, 2021b). The repair and maintenance sector for motor vehicles reached a turnover of EUR 120 billion (Eurostat, 2021a).

Table 28 - Key indicators of computer and personal and household goods repair statistics (NACE division 95) and repair and maintenance statistics of motor vehicles (G45.20) EU, 2018. Adapted from (Eurostat, 2021b) and (Eurostat, 2021a)

Key indicators	Repair of computer and personal and household goods repair	Repair and maintenance of motor vehicles
Number of enterprises	188,781 (0.8%) ⁸⁷	452,830
Number of people employed	359,509 (0.3%)	1,300,000
Turnover [EUR million]	23,967	120,000
Purchase of goods and services [EUR million]	15,408	86,954 (data from 2017)
Personnel costs [EUR million]	5,298	25,500 (data from 2017)
Value added [EUR million]	8,539 (0.1%)	37,600 (data from 2017)
Gross operating surplus [EUR million]	3,241	12,000
Apparent labour productivity [EUR per head]	24,000	
Average personnel costs [EUR per head]	27,300	
Wage-adjusted labour productivity [%] (Apparent labour productivity/ Average personnel costs)	87.0%	
Gross operating rate [%] (Gross operating surplus/Turnover)	13.5%	

As shown above, the apparent labour productivity of the EU's repair of computers and personal and household goods sector in 2018 was EUR 24,000 per person employed. This is below the non-financial business economy average (EUR 50,700).

In comparison to other businesses, the apparent labour productivity of the repair of computers and personal and household goods sector is very small (Eurostat, 2021b). It is the second smallest productivity within the non-financial business economy. The low wage-

⁸⁷ The percentages in brackets [e.g., 0.8%; 0.3%; 0.1%] display the respective share within the total non-financial business economy.

adjusted labour productivity⁸⁸ of 87% underlines the very low productivity in this sector (other sectors reach over 100%).

It is assumed that the low labour productivity is due to the fact that repair is a very labour-intensive activity. Due to the low productivity, employees of the repair sector are paid little. The average personnel costs accounted to EUR 27,300 per employee in the repair sector, which is more than 20% below the non-financial business economy average (EUR 35,000 per employee) (Eurostat, 2021b).

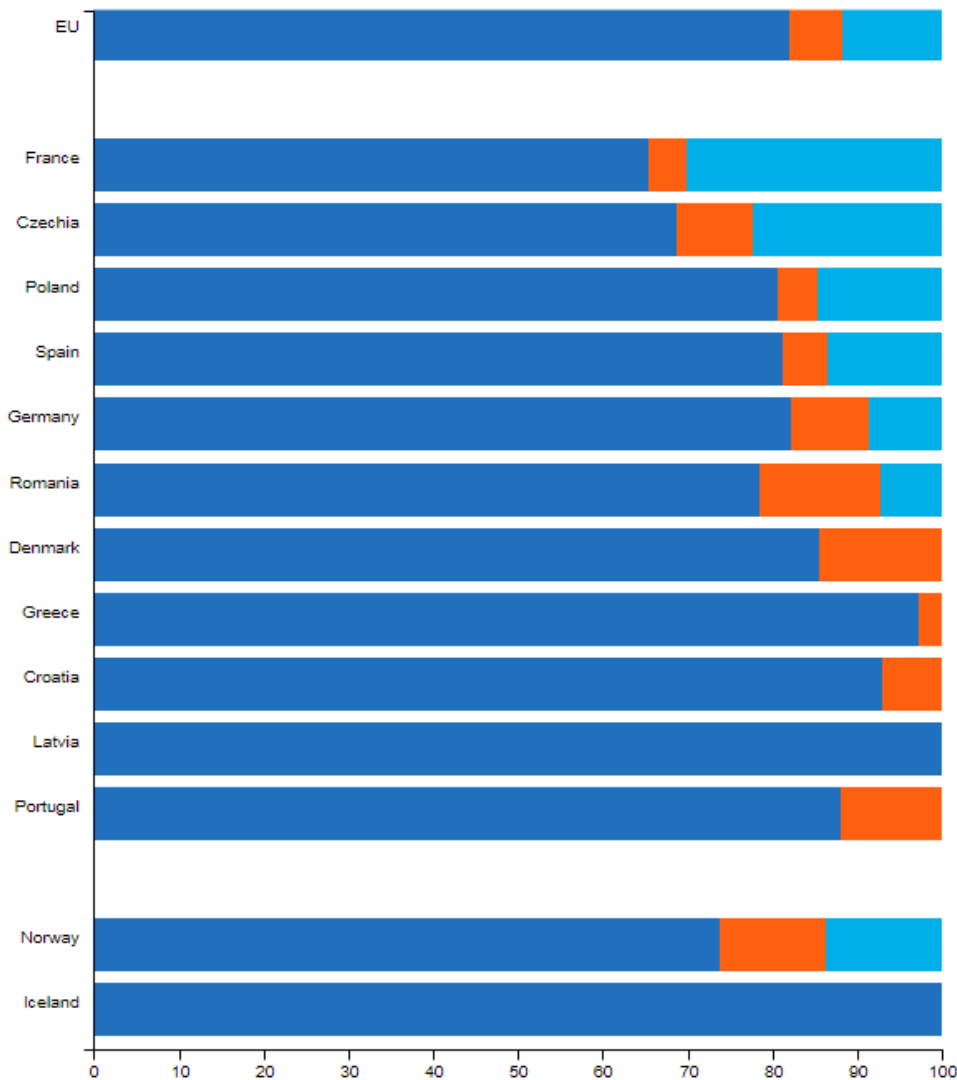
The gross operating rate⁸⁹, which measures the profitability, amounts to 13.5%⁹⁰. Eurostat explains that this relatively high rate is 'achieved as a result of relatively low levels of turnover compared with value added which is a pattern that is typical of many labour-intensive service activities (other than distributive trades)' (Eurostat, 2021b).

Figure 35 - Repair of computers and personal and household goods: Number of people employed by enterprise size class, 2018 (as % of total employment). Dark blue: small enterprises; Orange: medium enterprises; light blue: large enterprises.

⁸⁸ The wage-adjusted labour productivity ratio combines the apparent labour productivity with the average personnel costs to show the extent to which value added per person employed covers average personnel costs per employee. Within the repair of computers and personal and household goods sector, the personal costs per employee lie over the productivity (i.e. percentage <100%).

⁸⁹ Relation between gross operating surplus (EUR 3,241 million) and the turnover (EUR 23,967 million).

⁹⁰ The non-financial business economy average is 10.2%.



Source: The data is retrieved from NACE Rev. 2 Division 95 (Eurostat, 2021b)

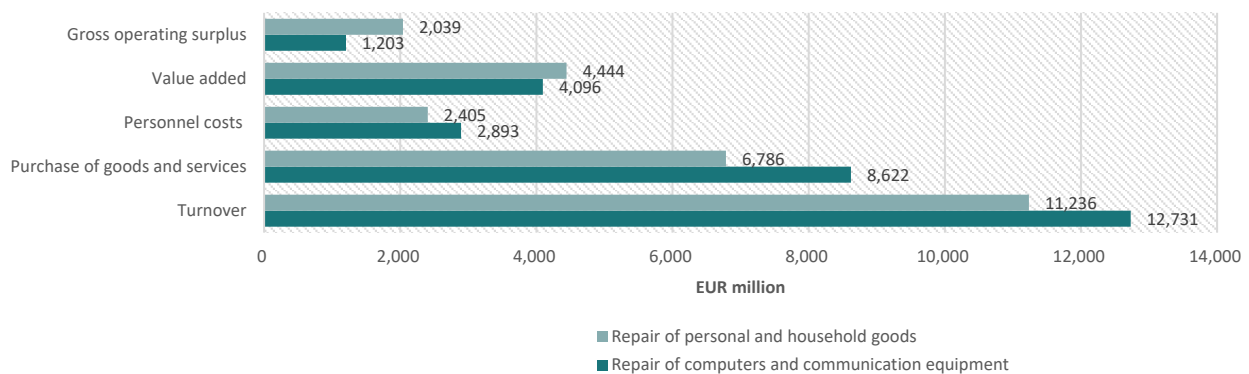
As shown in Figure 35 above, **Error! Reference source not found.** most employees in the sector for the repair of computers and personal and household goods work in small enterprises. In the EU27, 81.9% of the people employed in the repair sector work in small, 6.3% in medium and 11.8% in large enterprises. In relation to the total number of repair enterprises, France (30.2%), Czechia (22.3%) and Poland (14.7%) have the highest share of employees working in large repair companies. In Iceland (100%), Latvia (100%) and in Greece (97.3%) almost exclusively small enterprises are active. In the EU27, 99.6% of all repair enterprises are small and 0.1% are medium, so the remaining 0.3% are large enterprises. Although only a few large repair enterprises exist in the EU27, they contribute with a higher share to the number of employed people and the gross value added (22.3%). The share gross value added by small enterprises amounts to 67.2% and to 10.5% by medium enterprises (Eurostat, 2021b). There is no national or international player conducting its activity in this area (Rechnio, 2013).

The subsector 'repair of personal and household goods' generated a higher gross operating surplus and a higher value added than the subsector 'repair of computers and communication equipment', although the turnover and the purchase of goods and services was lower. This difference might be due to slightly higher personal costs in the more

technical activity of the repair of computers and communication (54.6% of the total repair sector) (Eurostat, 2021b).

The number of people employed and the number of enterprises are significantly higher in the subsector 'repair of personal and household goods' than in the subsector 'repair of computers and communication equipment'. In 2018, 65.7% of employment was generated from 'repair of personal and household goods', whereas 'repair of computers and communication equipment' contributed to 34.3% of the employment (Eurostat, 2021b).

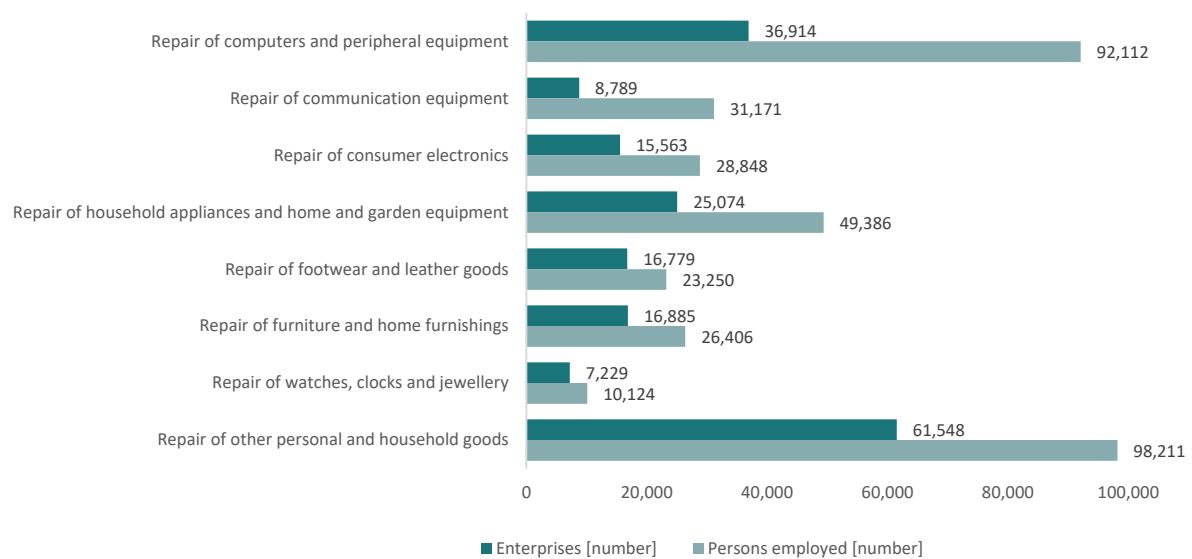
Figure 36 - Sectoral analysis of computer and personal and household goods repair statistics (NACE division 95), EU, 2018) – Monetary values



Source: Data retrieved from (Eurostat, 2021a).

According to Figure 37, 'Repair of computers and peripheral equipment' and 'Repair of other personal and household goods' have the largest number of staff employed (each over 90,000 employees) and of enterprises, followed by 'Repair of household appliances and home and garden equipment' (nearly 50,000 employees). Between approximately 10,000 and 32,000 employees can be allocated to each of the remaining categories and between approximately 7,000 and 17,000 enterprises are active in each of these fields.

Figure 37 - Number of people employed and number of enterprises according to repair activities within the sector 'Repair of computers and personal and household goods'



Data retrieved from (Eurostat, 2021a).

In France, the automotive repair sector represents 60% of the repair companies in all sectors. Among the other sectors, computer and IT equipment repair are predominant, followed by repairers of furniture and decoration (Deloitte, 2016).

From interviews we learnt that all stakeholders would like to see the repair market to grow. However, there was no clear picture as to whether currently there is a lacking repair infrastructure. According to a stakeholder from the furniture industry, there is indeed a lack of repair infrastructure. This stakeholder sees the lack of suitable apprenticeships (e.g. lacking sewers, cobblers) as an important factor in the decreasing repair infrastructure. He is also of the opinion that an increasing repair demand would swamp the repair market, hence leading to decreasing quality. According to another stakeholder, there is no bottleneck in the repair market yet, but he expects the repair market to disappear within the next years. A non-representative overview of results of a London based repair Directory shows that many repair shops exist for mobile phones and laptops. For large household appliances such as washing machines and TVs the number of repair shops is significantly lower. The repair Directory did not include repair shops for clothing, shoes/footwear, cars or (wooden) furniture.

Past evolution of repair market

A general impression from different sources is that the repair market (including automotive repair) has decreased within the last few years in specific EU countries (see below). According to the data retrieved from Eurostat (see below), this statement cannot be entirely confirmed for EU27. It seems that the key indicators have remained relatively stable over the last 10 years (see figures below). The repair market developed differently not only depending on the MS but also on the product sector. For some products the repair sector has been mature and established for a number of years (e.g. cars, white goods, computers), whereas for other products it is relatively new (e.g. smartphones) or a declining business

(e.g. shoes, clothing) (Deloitte, 2016). Statements on the development in specific EU MS and for specific products are summarised here:

- WRAP⁹¹ recently studied the status of repair in the **UK** reuse sector, concluding that the market for repair of **electrical items** has seen a general long-term decline, driven by falling costs of new products, greater product complexity and reliability (Deloitte, 2016).
- In **France**, the whole sector (including automotive repairs) decreased in terms of number of businesses (-7%) and employment (-20%) between **2009 and 2012**. In general, the turnover of repairers remained constant, whereas it dropped for household appliances (Deloitte, 2016).
- In the **Netherlands** (over 10 years, before 2016) the number of specialised firms in **electronics repairs** went down from 4,500 to 2,500 (Montalvo et al., 2016).
- In **Poland**, between **2008 and 2010**, the number of repair enterprises active in the repair and maintenance of consumer and household goods decreased from 16,793 to 14,070, a decrease of 16% in two years. The number of employees dropped in this period from almost 28,000 to about 21,000 (Central Statistics Office of Poland 2012).
- In France, between **2010 and 2012**, the turnover of the repair sector decreased by 3% due to the automotive sector, while the turnover of the other subsectors increased (Deloitte, 2016).
- The CEAP estimates that the number of jobs linked to the circular economy in the EU grew by 5% between 2012 and 2018 (reuse, 2021).
- In 2018-2019, the repair and service industry in Europe recorded EUR 1.9 billion industry turnover with 29,000 direct and indirect business partners in repair and after-sale services (APPLIA, 2020).

According to the figures below, the following developments between 2011 and 2018 can be described:

In total, the number of enterprises and the number of people employed within the sector of the repair of computers and personal and household goods, as well as those for the repair and maintenance market of motor vehicles, remained relatively stable over the last 10 years.

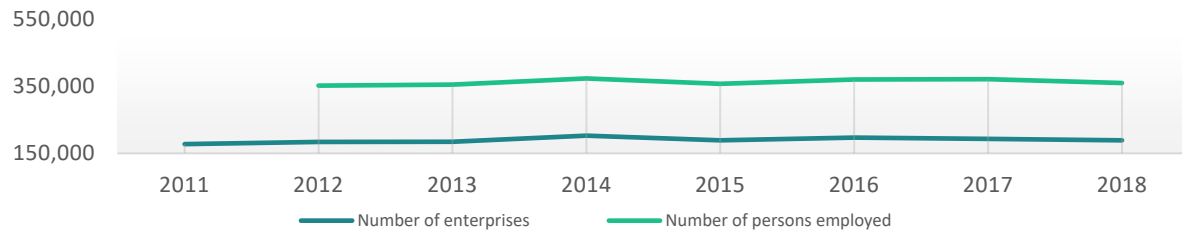
Within 'repair of other personal and household goods' (e.g. bike repair) the number of enterprises increased, whereas the number of enterprises for 'repair of footwear and leather' decreased.

Before 2014, a decline of all key indicators was observed. However, in the few last years, a certain recovery seems to have taken place. In the repair sector (including automotive) the turnover reached a peak in 2017 and was slightly declining in 2018. The personnel costs and the gross operating surplus has remained relatively stable over the last 10 years.

⁹¹ The Waste and Resources Action Programme (WRAP): <https://wrap.org.uk/>

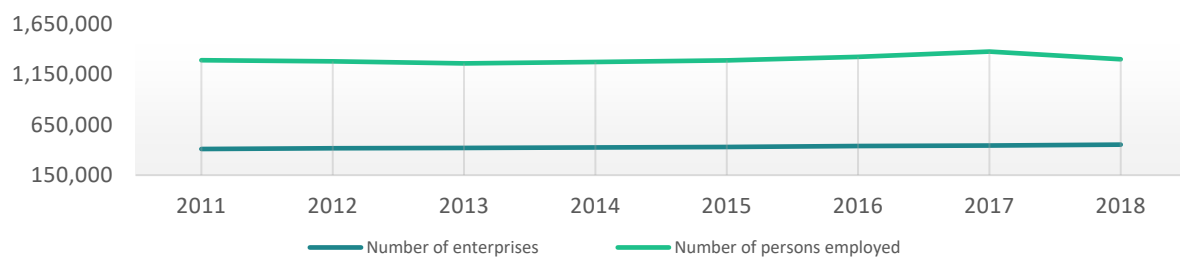
Number of enterprises and people employed (2011-2018) according to Eurostat data

Figure 38: Development of the number of employees and the number of people employed within the sector of repair of computers and personal and household goods (2011-2018, EU27).



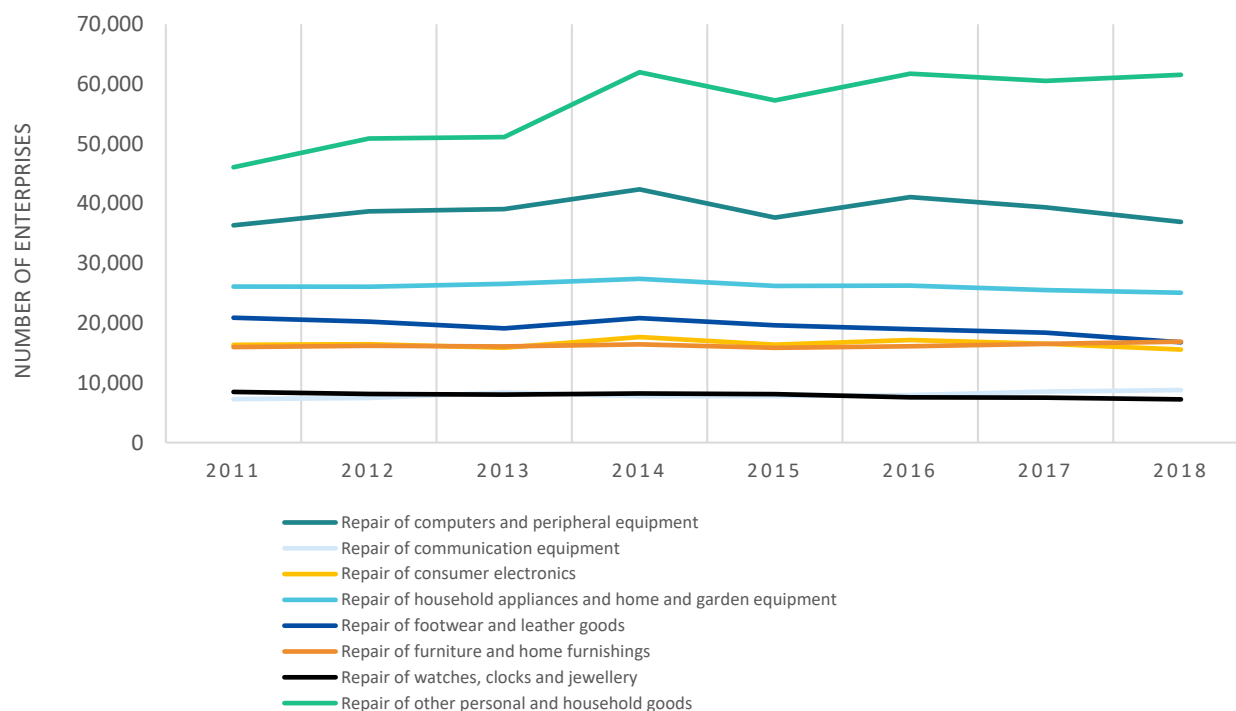
Source: Data retrieved from (Eurostat, 2021a).

Figure 39 - Development of the number of employees and the number of people employed within the sector of repair and maintenance of motor vehicles (2011-2018, EU27).



Source: Data retrieved from (Eurostat, 2021b)

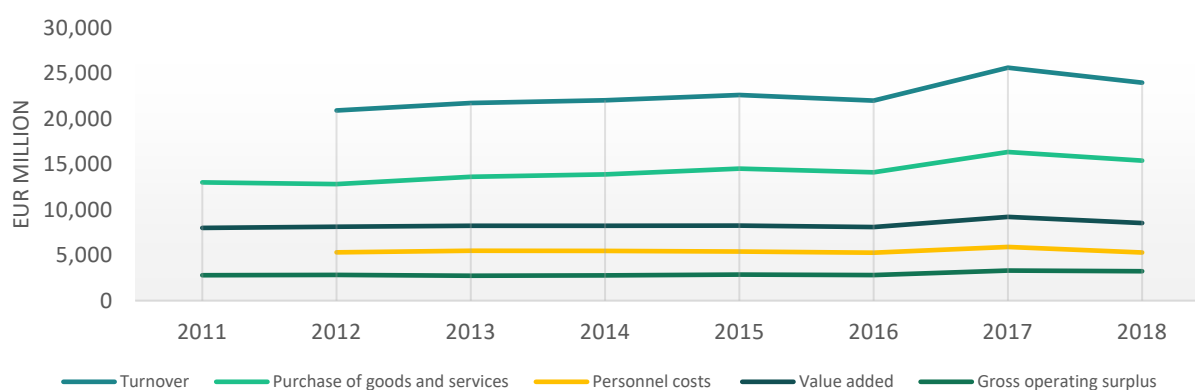
Figure 40 - Development of the number of enterprises within different repair sectors (2011-2018, EU27).



Source: Data retrieved from (Eurostat, 2021a).

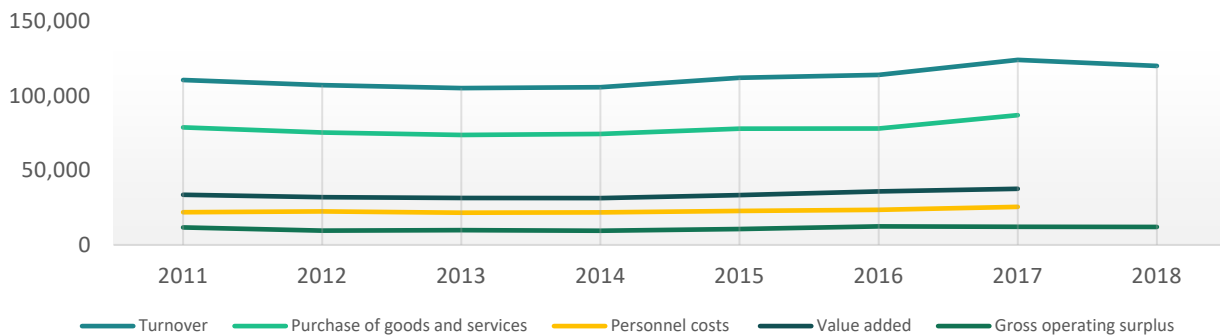
Other market indicators such as turnover, costs, value added according to Eurostat data

Figure 41 - Development of different financial key indicators within the sector of repair of computers and personal and household goods (2011-2018, EU27).



Data retrieved from (Eurostat, 2021a).

Figure 42 - Development of different financial key indicators within the sector of repair and maintenance of motor vehicles (2011-2018, EU27).



Data retrieved from (Eurostat, 2021b)

Future developments in the repair market within the next 10 years

According to stakeholders, two opposing trends within the repair market exist. It is estimated that within the coming years some repair businesses will grow, whereas others are at risk of disappearing. The possible increase/decrease of the repair market seems to vary between product groups. Electronics repair, especially smartphone repair, is expected to grow, whereas clothing and furniture repair might decrease. Surveys from France confirm that the demand for repair services in the field of toys, clothing and furniture is not high enough to sustain repair services. On the other hand, the demand for repair services in the field of electric and electronic goods continues to be high (ADEME et al., 2018).

One stakeholder even expects the repair market to disappear in the next 5-10 years. They state that repair performed by manufacturers has almost disappeared, and the other repair businesses will follow. Additionally, there will be an ageing of the current repairers leading to repair closings. The same stakeholder claims that original spare parts remain too expensive for all sorts of repairers, thus making the repair not worth the cost. Interestingly, this stakeholder does not see high labour costs as a reason for less repair but rather the high prices of spare parts and the low prices of certain products. However, other stakeholders do see high (European) labour costs as a major barrier to repair. Stakeholders claim that independent repairers and sellers should have improved access to spare parts as it might unlock further economic potential and create an appropriate incentive for repairing products. Other stakeholders agree that currently manufacturers dominate the repair market. They assume that a right for consumers to choose an appropriate repairer without losing the legal guarantee status would boost the repair market. Other studies estimate that the limited profitability of repair businesses and the low wages that do not attract professionals are hindering these businesses (Deloitte, 2016). One stakeholder noted that an increase in repair activity requires, above all, a reduction in repair prices. However, they mention that cost-effective and thus attractive repair is only possible if spare parts are available and repair monopolies of manufacturers are prevented. Another stakeholder fears that software applications from manufacturers can be used to create more repair monopolies (e.g. with advantages for contracted repairers) leading to a decrease in the number of independent repairers, who often charge lower prices for repair activities.

Other stakeholders interviewed expect the repair market to grow in the next years. They observe that users want to repair more. Some believe that some repair skills are at risk of vanishing, but enough people still have repair skills and will be able to work in the repair sector or do self-repair. Another reason to be optimistic is that specific products (e.g. smartphones) are partly designed in a more durable way and tend to become more expensive, so that repair is more worthwhile. This might lead to an increasing demand for repair services or repair supporting services (e.g. instructions, tools etc.). Moreover, it is mentioned that resource scarcity will force industry and consumers to be sustainable. Political movements are expected to put adequate pressure on society to enable sustainable developments, thus increasing, among other things, repair activities. Stakeholders believe that especially legislation aimed at reducing repair costs (e.g. via repair vouchers) would lead to more repair. As the ESPR is also expected to push reparability further, an increase in the repair market seems possible. As described earlier, durability is currently considered the most important feature in the product design (indicated by 75% of manufacturers), while features such as reparability (31%) and recyclability (29%) seem to play a less important role. However, data also suggests that the importance manufacturers attribute to reparability within product design will increase in the future. A higher reparability might positively impact the repair market.

Other stakeholders believe that the repair market still offers many business opportunities, such as using 'product-as-a-service' to increase repair. Overall, the current development of the smartphone repair market is a positive sign that a repair market can grow and be agile. Over the last few years, several thousands of new repair shops from self-employees opened their doors to offer smartphone repair. A stakeholder estimated that 90% of the repaired smartphones are from Apple. It attributed such a success in the context of repair to cheap spare parts, which are often produced by Chinese companies, and to the high value retention of the phones. The announcement of Apple to make repair manuals and tools available to users might democratise repair.

One stakeholder from the furniture industry mentioned that currently the repair infrastructure is dense enough to allow repair under the legal guarantee. However, if the furniture business increasingly shifts to online trade, these sellers must set up a network similar to the current sales network to ensure a nationwide contact point for consumers (among others for repair claims). They might set up such a network themselves or in cooperation with repair businesses. In the future, stationary suppliers who deliver to areas where they do not have a stationary presence will also have to ensure sufficient points of contact. It can be assumed that the shift to online sales and the consequences described will not only affect the furniture industry, but also many other products.

Another development which might be relevant in the future is the further use of synergies between the growing refurbishment and resale market and the repair sector. One stakeholder considers that reuse, refurbishment, and repair will co-exist in the future, allowing for beneficial synergies, which should be exploited. For example, data from 2011 shows that 23% of the WEEE separately collected at Household Waste Recycling Centres (HWRCs) could be reused with only a small amount of repair. This would prevent such products from being disposed of (WRAP, 2011). Other sources confirm that the resale of phones, laptops and tablets have a great potential in the EU due to a growing second-hand market. A German online marketplace for refurbished phones, laptops and tablets, increased its sales from 2018 to 2019 by more than 500% (sifted, 2020). Particularly the second-hand market for electronics and more specifically for high-end electronics (e.g. headphones with prices over 500 Euro) is growing. Moreover, refurbished goods are

perceived as an availability for lower-income consumers to access lower-cost products (Ribeiro-Broomhead & Tangri, 2021). Today, manufacturers are not allowed to replace broken products (within the legal guarantee) with a refurbished product. However, this could be changed.

4.4. Scale and development of second-hand and refurbishment sectors

Refurbishment

Within the last few years, several online marketplaces/platforms⁹² have been developed that allow manufacturers and sellers to sell refurbished products. The online marketplace 'Refurbed', for example, sets out that private individuals are not allowed to offer equipment on the platform. Some sellers and online shops (see for example the return programmes from Fairphone or Telekom) offer the take-back of old devices from individual consumers (sometimes only when buying a new one) with the aim to place the product into a refurbishment or recycling process (Teqcycle, 2022). Depending on the condition of the device, the consumer is offered a voucher or a certain amount of money (called trade-in or buy-in offers). Otherwise, consumers can donate devices to specific collection systems, which partly transfer in-good-condition products to refurbishment companies. However, it seems that the most common source of supply for refurbishment processes (at least for electronic devices) is industry returns or returns from business clients with or without leasing contracts (e.g. business phones). Several companies performing refurbishment repurchase products in categories A-C or D or 'new', 'as new', 'really good' and 'good'⁹³, which are related to specific price classes. These grades are influenced by the supply source (i.e. industry return, consumer supply), the external appearance (e.g. traces of use) and the age of the refurbished product. Reuse and refurbishment companies only collect products that are reusable and suitable to them, i.e. they check the products before they accept them. Moreover, they only take safe products. In general, the decision about which products to accept for refurbishment is mainly experienced-based. However, according to stakeholders, the following criteria are mostly considered:

- Functionality;
- Safety;
- Age;
- Design;

⁹² Company/marketplace examples (non-exhaustive list): <https://asgoodasnew.de/>; <https://www.backmarket.de/>; <https://www.refurbed.de/>; <https://www.teqcycle.com/>.

⁹³ The company asgoodasnew, for example, sells refurbished products in the categories new, like new, very good and good condition. "New" means that the unit has never been opened, so, depending on the manufacturer, it may still be shrink-wrapped. "Like new" has already been opened but shows no signs of use. Slight signs of use can be found on the unit in "very good" condition. In "good" condition, there are more severe signs of use such as scratches (<https://asgoodasnew.de/MacBook-Refurbishment/>).

- External appearance (which naturally is very subjective);
- Brands; and
- Trends.

According to the 'Refurbed' website, the sellers selling on this platform use original equipment manufacturer (OEM) spare parts when refurbishing. However, they are also allowed to use non-OEM parts when the manufacturer does not offer spare parts for sale. The non-OEM parts must have the same quality and specification as OEM parts, especially for mobile phones and tablets. Refurbished products are often equipped with a voluntary guarantee to make the second-hand product more trustworthy. Unlike repair, where specific parts are covered by a new guarantee, guarantees for refurbished goods are likely to cover the whole product (European Commission, 2014).

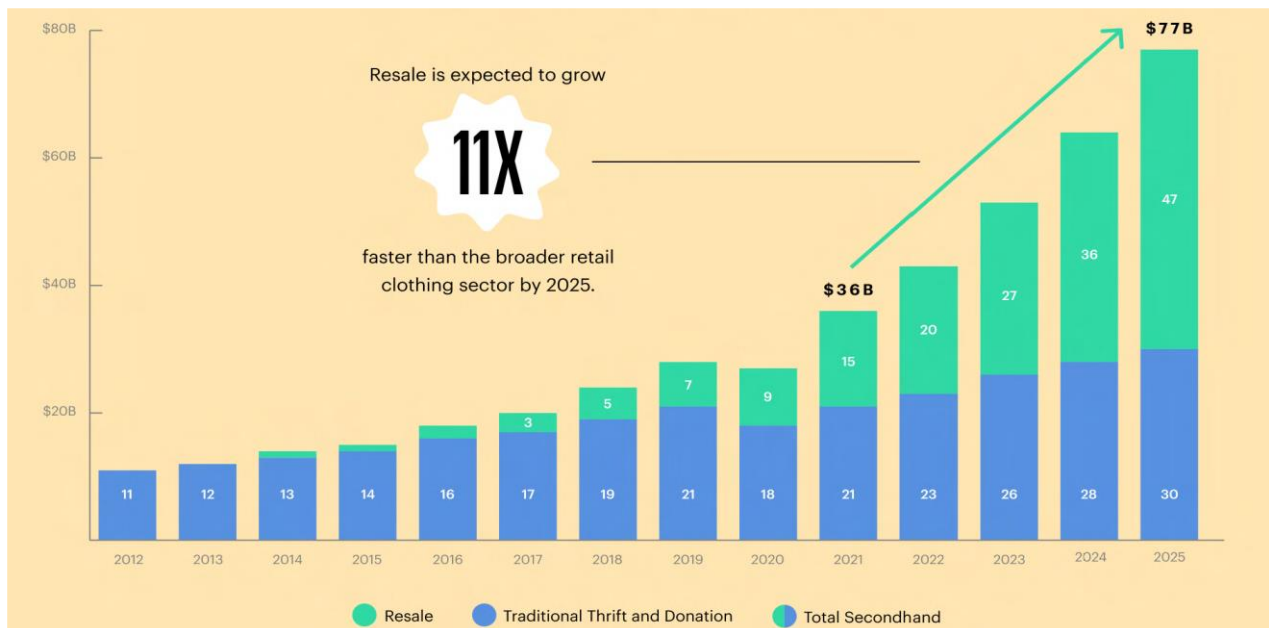
Second-hand and used products

The evolution of the second-hand market/market for refurbished products within the last ten years as well as the predictions for the upcoming ten years vary widely across countries and products⁹⁴. Most studies focus on the second-hand market for a particular product category (mostly, clothes) in a single country. Thus, the transferability of the following findings is limited.

According to Guiot and Roux (2010), there has been an increase in second-hand consumption within the past 40 years. For the upcoming years, the second-hand market in general is predicted to show impressive growth rates. For clothes, the second-hand purchases could even outperform fast fashion over the next five to ten years (ThredUP, 2021). These results are supported by an increase of online second-hand fashion platforms that can already be observed (Bain & Company & Depop, 2021).

Figure 43 - Projection of the second-hand market for clothing

⁹⁴ Amongst the large EU MS, Germany is the one with the biggest revenue from second-hand goods sales (2016: 3 335,13 million dollars, estimated to rise to 3 570,08 million dollars by 2023), while the lowest revenues were achieved in Greece (2016: 11,15 million dollars) and Slovenia (2016: 3,08 million dollars) (Eurostat., 2019).



Source: (ThredUP, 2021)

Figure 43 shows that the second-hand market for clothes is projected to double within the next 4 years, reaching a volume of about 77 billion dollars in 2025.

The general increase of second-hand consumption is mainly due to a shift of attributes associated with second-hand goods. The second-hand bias, especially the shame and stigma linked to second-hand consumption, has vanished (Ferraro et al., 2016) and second-hand goods have become cool and stylish (Franklin, 2011) and, as stated above, a lifestyle choice (Steffen, 2017). Hristova (2019) makes a similar observation and reports a change in consumer habits of younger, prejudice-free generations, since second-hand purchases have been transformed from a lower-class purchase into a worldwide fashion trend. According to stakeholders, the ability to resell second-hand products depends on the economic situation in a MS. Citizens of high-income countries mostly show a higher selectiveness towards second-hand products, i.e. they only purchase high-quality or trendy second-hand products.

Although consumers might show a growing willingness to pay for second-hand and refurbished goods, prices for some product categories might already be too high for the average consumer. Especially for second-hand clothes, resellers are being criticised for making them no longer affordable for the lower income households who have been relying on second-hand shopping for decades (Hunkin, 2021). Thus, an even greater change of the target audience can be expected. In the future, the second-hand market for clothing will especially target consumers of Generation Z, who value new fashion, designer clothes and the emotions associated with conversation and connection with peers via second-hand purchases (Bain & Company & Depop, 2021). It can be concluded that lifestyle as a factor influencing consumers' buying decision for second-hand and refurbished products will be of growing importance within the next years.

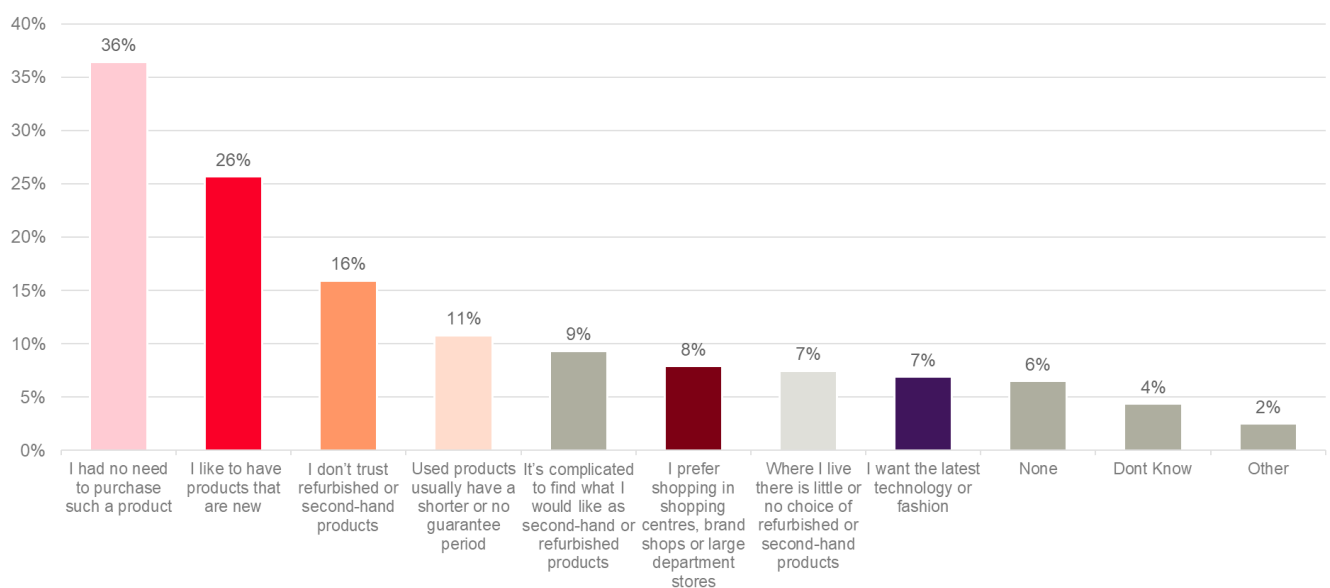
In accordance with the results above, Hristova (2019) investigates current trends and underlying root causes in second-hand goods markets. She finds that young consumers are more flexible in their choice and less susceptible to risks related to using second-hand products. 33% of consumers buying second-hand clothes are within 20-30 years of age, who adapt to buying used products 2.5 times quicker than other age groups.

Consumption culture in the second-hand market for clothes will change due to growing environmental awareness especially of the younger generation. Although some second-hand consumers will continue to keep changing their wardrobes and make impulsive purchases, they (will) prefer, now and in the future, to buy from sellers that are eco-friendly and participate in the circular economy (ThredUP, 2021).

Marci (2021) points out that especially the younger generation sees a potential risk of greenwashing⁹⁵ and already requires full transparency and authenticity. Consumers usually identify second-hand clothes as responsible. This leads to the factor of perceived quality of second-hand products. In the future, sellers might be required to offer transparency, labels, or certificates in order for consumers to perceive their products as attractive.

Although the literature suggests that the younger generation is readier to buy second-hand goods, the results of the consumer survey carried out for the purpose of this study show that many consumers still want to have new products. Across all product groups, between 20% and 30% of respondents claimed that they like to have new products. Especially in the case of mobile phones, consumers seem to distrust used products (see figure below, where lack of consumer trust comes third in the ranking). Moreover, in the past 12 months, a maximum of 16% of the respondents (excluding clothing) had bought refurbished or other second-hand products. For refrigerators the rate of buying a used product was only about 9%. In this regard, clothing is an exception, with 25% of the respondents stating that they bought used clothing in the past 12 months.

Figure 44 - Consumer reasons for not buying a used product



Source: Authors based on Consumer Survey Exercise

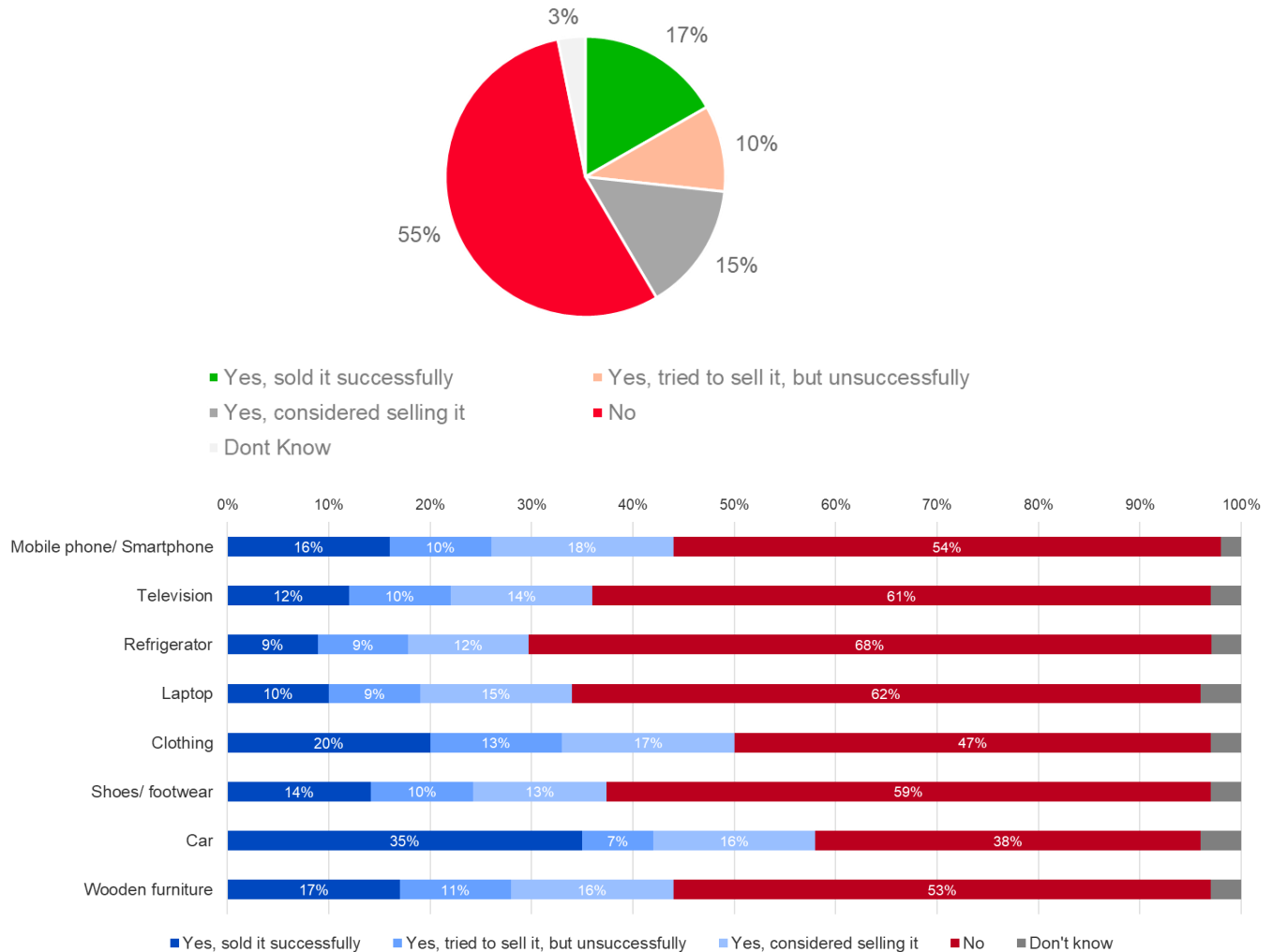
The vast majority of those consumers who bought used products said that the price was the decisive factor in their purchase decision. According to the consumer survey, the second

⁹⁵ The EC uses the term 'greenwashing' when referring to companies giving a false impression of their environmental impact. More information at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12511-Environmental-performance-of-products-businesses-substantiating-claims_en

most important factor to buy used products was the cost-benefit ratio. Especially when purchasing used cars, the price and the relative better price for the quality seem the most important aspects. For other product groups (e.g. TVs, mobile phones) 'a retro look', 'carbon footprint of the product' or 'concerns about waste' were also mentioned as reasons for buying a used product. But even for these products, price was still mentioned two times more often than the other deciding reasons. Consumers consider the price, the quality, and the offer of a commercial guarantee 'very important'. 'The availability of stores offering used products', 'the availability of online platforms offering used products', 'the range of products offered as used' and the 'consumer reviews on the seller' are not considered 'very important', but many respondents classified them as 'rather important' reasons. Hence, these aspects should not be neglected either.

Interestingly, the number of consumers who bought used products within the last 12 months is similar to the number of those who successfully sold used products at some point in their life (e.g. 15% of respondents bought a used mobile phone in the past 12 months and 16% of respondents successfully sold a mobile phone at some point in their life). While only 16% of respondents have bought a used car in the last 12 months (this low number could also be due to the fact that cars are generally only bought every few years), 35% have already successfully resold a used car in their life (see figure below). For all products there is a stable number of consumers who considers reselling second-hand products. These consumers – who, depending on the product, represent 12% - 18% of respondents – could contribute to the second-hand market in the future.

Figure 45 - Consumer responses on the question if they have ever sold or considered selling used products that they owned



Source: Authors based on Consumer Survey Exercise

According to the consumer survey, the major reasons for not having sold a used product are 'I did not have a used product of this kind to sell or give it away', 'I preferred to give the product away or donate it', 'the product was too damaged or run down to sell it', 'the price I would receive was not worth it'. For used shoes and clothing the possibility to donate was a major factor for consumers to decide against reselling the product.

4.5. Overall conclusions

It was found that for all eight products selected for the purpose of this study, repair and reuse structures exist. Refurbishment (i.e. resale after functional and aesthetical reconditioning) is common in the electronics sector (mobile phones, TVs, and laptops) and emerging in the clothing and furniture sector. Self-repair is partly performed for clothing, whereas for electronics professional repair services are typically used. Many repair activities are still very expensive, e.g. the replacement of a mobile phone screen. However, as the screen is one of the parts which is most likely to break down, it is also repaired relatively often. When a product shows a defect that was present since delivery within the legal guarantee, the claim

can be made towards the seller. However, in practice the legal guarantee often overlaps with the commercial guarantee offered by the manufacturer. In these cases, the seller directs the repair to the manufacturer or to contracted repairer networks. In-house repair from manufacturers is rare today; however, the manufacturer pays the repair under the guarantee and provides the spare parts. Due to expensive logistics and repair costs, manufacturers and sellers often prefer replacement over repair.

When the product breaks outside the legal guarantee, consumers must bear the costs of the repair. Therefore, consumers can either acquire a commercial guarantee which gives additional protection outside the legal guarantee or repair the product at their own cost. If the manufacturer offers repair beyond the guarantee, they might use the same infrastructure as under the guarantee to provide repair. Outside guarantees, consumers can perform self-repair, visit a repair café, or turn to an independent or an authorised repairer. Local repair shops seem to be the consumers' favourite option (between 25% and 53% of consumers prefer it, depending on the product). Smaller defective products repaired (e.g. phones, shoes etc.) are normally mailed in or carried to a repair shop. Larger products (e.g. refrigerators) are inspected and repaired by a technician coming to the consumer's premises.

For certain products (e.g. shoes, refrigerators) the amount of repair activities has decreased over the last few years, whereas repair activities for electronics increased. The analysis of general Eurostat market data according to categories defined in NACE Rev.2 (e.g. repair of consumer electronics) confirmed that in some repair sectors the number of repair companies decreased (e.g. in the case of repair of footwear and leather goods), whereas in other sectors an increase was observed (e.g. for 'other personal and household goods' such as bike repair). Although the repair market seems to have been quite stable over the last 10 years, before 2014 a decline, and after 2014 a slight recovery could be observed. The turnover of the repair sector (including automotive sector) reached a peak in 2017 and was slightly declining in 2018. Many barriers are still hindering the development of a fast-growing repair market. According to stakeholders, one of the most striking barriers is the non-availability of spare parts. As manufacturers are not obligated to make spare parts available for every product, especially independent and DIY repairers are suffering a lack of spare parts. Moreover, the price and the delivery time of spare parts are barriers to a convenient repair.

5. Assessing impacts of specific measures promoting longer useful life of product

This chapter evaluates various measures that could contribute to extending the useful life of products and as a result decrease the amount of waste generated by consumers. An exhaustive list of measures was considered with the aim of only retaining those that would prove to be the most effective in tackling the main problems that the study is trying to address (e.g. by increasing repair rates and contributing to efficient use of resources).

The effectiveness of each measure in addressing the core problem is assessed individually in order to only retain the ones that can increase take-up of repair among consumers and the use of repaired and second-hand goods. Furthermore, in this chapter we assess the impacts of the retained measures (on consumers, businesses, environment) and based on these impacts the preferred policy measures are retained.

5.1. Problem definition – summary of main findings

Based on the findings of chapter 3, premature disposal is to be considered a problem for several product categories leading to substantial economic and environmental consequences. Therefore, there is a need for EU action (see next section). The present section summarises the information of chapter 3 on problem drivers, scale of the problem, problem evolution and impacts.

The phenomenon of premature disposal of consumer goods is influenced by various factors and involves several stakeholders, which adds to the complexity of the problem. Stakeholders contribute to the phenomenon in different ways: producers and sellers benefit from linear production and consumption systems that promote producing and selling large number of products. On the other hand, consumer behaviour is not only affected by the consumers' attractions to novelties which lead to higher consumption. Aspects related to, amongst others, the cost of repair compared with purchasing new goods, the acceptance of second-hand goods and trust in repair also play a role. At the same time there are several economic, regulatory, and psychological factors that hinder the repair of products or make it less attractive for consumers than replacement. As premature disposal applies to different product groups to a different extent, the problem analysis is based on insights from product-specific assessments for eight selected product categories. We conclude that the problem of premature disposal applies to seven of the eight product categories analysed (see Table 5).

Table 29 - Overview on the conclusions concerning the problem of premature disposal in the product categories assessed

Product	Is there a potential problem of premature disposal?
Mobile phones/Smartphones	Yes.
Televisions	Yes.
Refrigerators	Yes.

Product	Is there a potential problem of premature disposal?
Laptops	Yes.
Clothing	Yes.
Shoes/Footwear	Yes.
Cars	No.
Wooden furniture	Yes; for products made of lower quality.
	No; for products of high quality

Based on our assessment, it can be concluded that premature disposal reduces the consumption lifetime of consumer goods, which entails significant environmental (see chapter -177732352) and economic impacts (see chapter -177732352). The lifetime of a product depends on the product's nature (absolute lifetime as designed by producers) and its maintenance by consumers (average consumption lifetime). In this context, our analysis revealed that a significant share of products might fail within the first service year and that consumers prefer replacement over repair (see chapter -177732352). This suggests that, if products are not repaired, defects can substantially reduce the lifetime of consumer goods.

Within this study, two problem aspects were identified which contribute substantially to a short consumption lifetime of products:

- **Firstly, goods are not used as long as they could be because they are not repaired.** It can be concluded that several factors hindering repair exist. This includes choices made in the product's design and production phase, which can contribute to a short absolute lifetime of products, the consumer preference for new goods, the effort associated with repair, as well as the lack of incentives and insufficient infrastructure to repair products. The latter does not only involve lack of incentives for producers to offer repair services, but also incentives for consumers to get their products repaired by a repair service provider or repair them themselves. The most relevant reason for not having a product repaired is the high repair costs. In this regard, our findings reveal that the consumers' willingness to pay for repair ranges between 17% and 27% of the original price of the product, depending on the product category.
- **Secondly, there is limited use of second-hand goods by consumers.** The replacement of broken products with used products (i.e. second-hand products) enables the extension of the product lifetime and takes away the need of providing new replacement products. However, the problem analysis indicates that there is lack of incentives to buy second-hand goods. In addition, the availability of second-hand goods seems limited. Important aspects for a potential consumer bias towards second-hand or refurbished goods are the consumers' expectations and perceptions on quality, durability, repairability or hygiene of a product. So, amongst others, a lack of trust in refurbished or second-hand goods and negative attitudes towards used and repaired products play an important role in the context of the potential consumer bias towards purchasing second-hand or refurbished goods.

5.1.1. Problem drivers

For a better understanding of the different drivers, the relevance of drivers has been assessed for each of the product categories assessed taking into consideration the findings from the literature review and expert inputs as well as the data from the consumer survey conducted as part of this study. Our findings suggest a differentiation between

- i) drivers that apply to all, or at least most of the product categories and/or are mentioned by a relatively high share of consumers as a reason for not having a product repaired (drivers with high relevance); and
- ii) drivers which apply only to several or a limited number of the product categories and are mentioned only by a rather small share of consumers as a reason for not having a product repaired (drivers with medium or limited relevance)⁹⁶.

Based on our assessment, drivers with **high relevance** include:

- repair is not economically attractive for consumers (i.e. buying new products is cheaper than repair) (economic driver);
- the consumer preference for new goods (psychological driver);
- the product design which makes the products difficult to repair (economic driver);
- the efforts required for repair (economic driver);
- the lack of a convenient repair infrastructure (economic driver);
- limited consumer acceptance of second-hand goods (psychological driver);
- lack of a regulatory framework outside the legal guarantee incentivising consumers to repair rather than replace.

Drivers with **medium or limited relevance** are:

- lack of trust in repair;
- insufficient knowledge to make an informed repair or purchasing decision;
- lack of incentives for producers to make spare parts, repair tools and provide information on available repair;
- repair is not economically attractive for producers as it limits their sales of new products⁹⁷.

⁹⁶ This also includes drivers where no quantitative information on the relevance of the driver was available.

⁹⁷ It can be assumed that this driver contributes to the high costs of repair and therefore its relevance might be higher than indicated in Table 15.

Overall, it can be concluded that high repair costs represent the most relevant driver contributing to the premature disposal of products.

5.1.2. Scale of the problem

In order to analyse the scale of the problem, both problem aspects identified within this study need to be considered:

- Goods are not used as long as they could because they are not repaired; and
- Limited use of second-hand goods by consumers.

Our analysis revealed that consumers tend to replace more than repair when a product is defective. 65% of consumers would always or probably have a product replaced compared with only 31% who would always or probably have it repaired during the legal guarantee period.⁹⁸ Consumers seem to prefer repair when products with higher prices (such as laptops or cars) break, while data suggests that especially low-priced products (e.g. hairdryers, toasters or mixers) are repaired less frequently (see Chapter 3). The results of the business survey showed that only some product types, such as cars, laptops and mobile phones, enjoy high repair rates when products are brought back by consumers to the seller, while other product types such as clothing, shoes and footwear are repaired only in 30-36%⁹⁹ of cases.

If consumers decide against repair, data suggests that the largest share of broken electronic and electrical devices (84% in Germany) are disposed of while only a relatively small share (16% in Germany) of products are passed on free of charge or sold by the consumers. If consumers make use of their rights under legal guarantee and in the event they choose to get the product replaced, it is up to the seller, the repairer, or the manufacturer to decide how to dispose of the defective device. Usually, it is decided to dispose of such devices.

Overall, the data on the scale of the problem of premature disposal of consumer goods is relatively scarce and varied¹⁰⁰. However, based on the available data¹⁰¹, the following conclusions can be drawn concerning the first problem aspects identified within this study:

Available data on mobile phones/smartphones, televisions and clothing indicates that 37-39% of consumers in the EU have never repaired these products. However, this indication should be considered with caution, as data is only available for three of the eight product categories assessed.

⁹⁸ As part of the consumer survey conducted for this study, consumers were asked about the propensity to have a product repaired or replaced assuming that a defect occurred within the legal guarantee period.

⁹⁹ The business survey did not distinguish between within and beyond guarantee for this question.

¹⁰⁰ More product-specific and MS-specific data on the scale of the problem is presented in section 3.3 of this report.

¹⁰¹ The data included information on the propensity of consumers to repair rather than replace products, information on the frequency of repair and the experience of consumers with repair (for some of the product categories) (see Chapter -180122992).

Available data on the analysed product categories indicates that in the EU approximately 30% of products are repaired. This suggests that more than two thirds (70%) of products are not repaired. However, as indicated in Chapter -177732352, the identified repair versus non-repair ratios between product categories vary significantly. Therefore, it is important to note that the aforementioned overall shares of repair and non-repair represent an approximate estimation and need to be interpreted with due caution.

Regarding the second problem aspect referring to the limited use of second-hand goods by consumers, we conclude the following:

A lack of trust in second-hand and refurbished goods lower the willingness of consumers to purchase such products as indicated in the consumer survey (depending on the product category, 11-20% of surveyed consumers mentioned this as a reason why they did not buy a used good). This is a lost opportunity when it comes to reducing environmental impacts due to premature disposal.

The results from the consumer survey suggest that only a relatively small share of consumers purchase second-hand goods (9-25% depending on the product category; see Chapter -177732352). However, when interpreting these figures, it should be considered that consumers might not have had the need to purchase one of the related products within the time period reflected in the survey (last 12 months).

The extent of the negative environmental impacts stemming from the identified problems is estimated to be very high. As many product groups suffer from premature disposal, a huge number of new products are bought, the purchasing of which could be avoided if the products were used until their technical EoL. Buying new products that could be avoided leads to CO₂ emissions, resource consumption and waste that could be saved. For example, in 2019, around 150 million mobile phones were placed on the EU market. The purchase of 122 million of these mobile phones could have been avoided, if the entire absolute lifetime of mobile phones (7 years) was used, instead of their current average consumption lifetime (1.8 years).

5.1.3. Problem evolution

The type and relevance of the drivers depend on the respective product category, and the concrete conclusions concerning the evolution of the problem must be based on the analysis of specific products or product categories, as well as on the impacts of the already adopted related Commission initiatives introducing changes to the regulatory framework¹⁰².

Overall, the available data suggests that some of the drivers identified in each of the product categories reinforce the problem of premature disposal while others are likely to decrease. Our analysis leads to the assumption that none of the developments identified will reduce the problem to an extent which would lead to the elimination of the problem within the next 15 years. Therefore, we conclude that the problem of premature disposal will still exist in 15 years. Based on our analysis, this particularly concerns those product categories where multiple drivers contribute to premature disposal, such as electronics and ICT (smartphones,

¹⁰² The problem evolution has been analysed against a dynamic baseline considering possible impacts of the ESPR and ECGT initiative.

televisions, and laptops) as well as clothing, shoes/footwear and wooden furniture made of lower quality, i.e. the product categories affected by fashion tastes.

However, general developments, such as the growing market for refurbished and used electrical and electronic products, as well as the increasing importance that manufacturers attach to aspects such as reparability and reusability in product design, need to be taken into account as they can alleviate the problem of premature disposal to a certain extent. Furthermore, data from the consumer survey indicated that this behaviour is likely to continue – at least for most of the product categories assessed – if there are no changes in the repair market.

5.1.4. Problem impacts

As outlined in chapter 3, a lifetime extension, i.e. a longer use of products, can reduce the number of purchased products. In consequence, resources, CO₂, and waste are saved. The headline economic indicators of the problem are summarised in the table below. These represent the difference between the baseline situation and a hypothetical 'optimal scenario' over the next 15 years. The latter is calculated under the assumption that the gap between current baseline average lifetimes and the theoretical maximum lifetime (derived from literature review) could be partially closed with the help of repair and reuse. The plausible maximum share of the gap that can be closed was assumed to be 25%. This value comes from a consensus assumption of the experts.

Table 30 - Summary of estimated economic impacts of the problem per stakeholder group (EU only) and per type of product, 2023-2037 (comparison to the 'optimal scenario')¹⁰³

	Average lifetime: from baseline to 'optimal scenario'	Manufacturing - Revenue from sales (producer prices)	Sellers (retail prices used as basis Additional retail margin, GVA and profit)	Repairers (revenue not realised and gross added value lost)	Users (reduced purchasing power)
Mobile phones	Avg. lifetime from 1.8 to 3.1 years	EUR 932 million of additional sales of new products Foregone sales of EUR 45 million of spare parts	Additional retail margin: EUR 135 billion EUR 36 billion of GVA	EUR 19 billion in terms of non-realised repair services GVA loss of about EUR 6 billion	EUR 271 billion additional purchase of new products EUR 12 billion savings on repair costs
Televisions	Avg. lifetime from 7 to 10.75 years	EUR 51 billion of additional sales of new products	Additional retail margin of EUR 58 billion	Loss of EUR 8 billion in revenue	EUR 117 billion additional purchase of new products

¹⁰³ This optimal scenario assumed that 25% of the gap between current baseline average lifetimes and the theoretical maximum lifetime (derived from literature search) is closed with the help of repair and reuse. The maximum realistic progress by 25% comes from a consensus assumption of the experts.

	Average lifetime: from baseline to 'optimal scenario'	Manufacturing - Revenue from sales (producer prices)	Sellers (retail prices used as basis Additional retail margin, GVA and profit)	Repairers (revenue not realised and gross added value lost)	Users (reduced purchasing power)
		Foregone sales of EUR 2.4 billion of spare parts	GVA of ca. EUR 16 billion	GVA loss of EUR 2 billion	EUR 4 billion savings on repair costs
Refrigerators	Avg. lifetime from 10 to 14 years	Approx. EUR 18 billion of additional sales of new products Foregone sales of EUR 0.8 billion of spare parts	Additional retail margin: EUR 28 billion Estimate of EUR 8 billion for additional GVA produced	EUR 4.3 billion in revenue not realised GVA loss of about EUR 1.7 billion	Approx. EUR 56.6 billion additional purchase of new products EUR 2.7 billion savings on repair costs
Laptops	Avg. lifetime from 4 to 4.75 years	About EUR 563 million in additional sales of new products Foregone sales of EUR 28 million of spare parts	Additional retail margin: EUR 41 billion Additional GVA of about EUR 11 billion	EUR 6.4 billion loss of revenue. This equates to ca. EUR 2.3 billion in GVA lost	EUR 82.3 billion additional purchase of new products EUR 4.7 billion savings on repair costs
Cars		Due to the high average age and the very significant secondary market, assessed as not significant for the problem of premature disposal and purchase of new products.			
Wooden furniture	Avg. lifetime from 9.7 to 14.8 years	About EUR 68 billion in additional sales Foregone sales of EUR 2.7 billion of spare parts	Additional retail margin: EUR 77 billion GVA approx. EUR 21 billion	EUR 11.2 billion in revenue foregone GVA loss of about EUR 5.0 billion	Approx. EUR 155 billion additional purchase of new products EUR 7 billion savings on repair costs
Shoes/ footwear	Avg. lifetime from 3 to 3.3 years	About EUR 14 billion in sales value revenue Foregone sales of EUR 0.7 billion of spare parts	Additional retail margin: EUR 34 billion Additional GVA EUR 9 billion	EUR 5.8 billion in foregone revenue GVA lost about EUR 2.8 billion	About EUR 67.7 billion additional purchase of new products EUR 3.4 billion savings on repair costs

	Average lifetime: from baseline to 'optimal scenario'	Manufacturing - Revenue from sales (producer prices)	Sellers (retail prices used as basis Additional retail margin, GVA and profit)	Repairers (revenue not realised and gross added value lost)	Users (reduced purchasing power)
Clothing (jackets and blazers only)	Avg. lifetime from 1 to 1.45 years	About EUR 1.7 billion in additional sales of new products Foregone sales of EUR 56 million of spare parts	Approx. EUR 5 billion in additional retail margin Additional GVA of EUR 1.3	EUR 636 million in foregone revenue GVA lost about EUR 302 million	About EUR 9.8 billion additional purchase of new products EUR 0.4 billion savings on repair costs
Total 7 products (not including cars)		About EUR 154 billion in additional sales Foregone sales of EUR 7 billion of spare parts	Approx. EUR 379 billion in additional retail margin GVA EUR 102 billion	EUR 55.3 billion in foregone revenue GVA lost about EUR 20.4 billion	About EUR 759 billion additional purchase of new products EUR 35 billion savings on repair costs
Extrapolation to whole economy (factor of 5.74)		About EUR 885 billion in additional sales Foregone sales of EUR 39 billion of spare parts	Approx. EUR 2,177 billion in additional retail margin GVA EUR 588 billion	A maximum of EUR 317 billion in foregone revenue GVA lost about EUR 117 billion	About EUR 4,354 billion additional purchase of new products EUR 200 billion savings on repair costs

5.1.5. Need for EU action

Analysed problems, their drivers and impacts show that there is a market failure related to repairing products. This market failure requires regulatory action. One of the identified drivers includes the lack of appropriate regulatory framework to allow consumers get defective products repaired at reasonable prices, mainly outside the legal guarantee. The lack of regulatory frameworks is linked to the lack of incentives to repair, compared with replacement, given the absence of hierarchy of remedies established in the SGD. The lack of information to consumers about the reparability and sustainability of products they purchase has recently been dealt with by EU legislation adopted in March 2022 on ECGT.¹⁰⁴ The initiative aims to ensure that consumers obtain reliable and useful information on

¹⁰⁴ Available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12467-Consumer-policy-strengthening-the-role-of-consumers-in-the-green-transition_en

products, such as lifespan and repair options, prevent greenwashing and set minimum requirements for sustainability logos and labels.

In order to provide a solution to the problem, legal and/or non-legal action is needed. This study shows that consumers, producers, and sellers will not change their behaviour if the regulatory framework does not provide for certain conditions.

Subsidiarity: Necessity and added value of EU action

The Treaty on the Functioning of the European Union (TFEU) recognises the EU shared competence to act through ordinary legislative procedure in the areas of internal market, environmental protection, and consumer protection (Article 4(2) TFEU).

Action is needed to ensure that all consumers have an equal right to repair, ensuring a prudent and rational utilisation of natural resources within the internal market. Options considered, which involve the adoption of legislative measures, including an amendment to the existing SGD, need to be analysed in order to determine if there is a justification for the EU to act (the EU added value) according to the principles of 'subsidiarity' and 'proportionality' established under Article 5 of the Treaty of the EU (TEU). These principles are not applicable to the adoption of measures defined as non-legislative acts as their justification and legal basis are established in the legal acts that require their adoption.

The principle of subsidiarity governs the choice of actor to legislate, either the EU or the MS. Under Article 5 of the TEU, the EU should act when the objectives of the proposed action cannot be sufficiently achieved by the MS at either their central or local level but can be better achieved at the Union level for reasons of scale or effects of the proposed action. This analysis is linked to the effectiveness of the action in relation to its objectives.

The justification for the EU to act based on the design of the options entails an analysis of the act's compliance also with the principle of proportionality. This principle requires that the content and form of any EU action does not exceed what is necessary to achieve the intended objective. This implies that the act will achieve its objectives in the most efficient way, which might not necessarily be at the lowest possible cost nor include governance procedures.

The implementation of these principles means that the EU action needs to be analysed in relation to its contribution to the EU's objectives to ensure the functioning of the internal market and environmental and consumer protection (Art. 114 TFEU).

The problems analysed in this study are of European and cross-border scale and have the same drivers and effects across the EU. The SGD has already harmonised certain rules on the sale of consumer goods in order to promote the cross-border trade and the functioning of the internal market, and it has a full harmonisation effect. Therefore, a new legislative action within the scope of the SGD would need to be adopted at the EU level and action at the national level would go against the shared powers recognised in the Treaty and the harmonised acquis based on existing secondary EU legislation. The SGD rules out the possibility for MS to act within the harmonised framework where only EU action is possible.

The SGD, as it currently stands, hardly takes into account the environmental impacts of the remedies system. The European Green Deal and its objectives of promoting the green

transition and more sustainable consumption are challenges and goals of the current decade. To deliver on these objectives, the assessment of reduction of harmful environmental impacts concerning consumer remedies cannot wait for the review of the SGD, foreseen only by 12 June 2024.

The EU action is therefore necessary in order to achieve the overall objective of more sustainable consumption of consumer goods within the EU in compliance with the subsidiarity principle. It is only through EU action that the desired effect of promoting repair and reuse in the context of cross-border sales can be achieved consistently across the internal market. By introducing harmonised rules related to the remedies system, the conditions for preventing fragmentation and increasing legal certainty are improved, compared with the baseline scenario involving adaptations only at national level.

The initiative will be targeted to achieving more sustainable consumption and it covers only aspects that can be better achieved by common measures (at the EU level) and where the administrative burden and costs are proportionate, given the benefits generated by the achievement of the specific and general objectives pursued. Proportionality will be ensured by carefully designing the scope and intensity of the proposed measure. Furthermore, qualitative and quantitative assessment criteria will be used to ensure that the options considered will cover all relevant stakeholders, addressing their needs.

Existing legislation at EU level

The problem definition discussed above illustrates the current situation of the premature disposal of goods by consumers and will be used as a benchmark against which the policy options are compared (the baseline scenario). Under the baseline scenario, changes to the current situation could only be brought by the recently adopted SPI and circular economy plans, meaning that consumers would rely solely on possible improvements brought to product design by manufacturers. In terms of impacts, the SPI is expected to facilitate a more harmonised single market with incentives for more sustainable and innovative products across the EU. It is also expected that the SPI will improve recyclability and increased recycled content, as well as durability and repairability of products, boosting at the same time jobs in the reuse and repair sectors. In terms of environmental impacts, the SPI is expected to significantly reduce environmental pressures (i.e. resource extraction, energy use, water use) and the associated environmental impacts (i.e. biodiversity loss, global warming).¹⁰⁵ Also impacting the design phase of a product, the ESPR¹⁰⁶ provides EU-wide rules for improving the environmental performance of products by setting out minimum mandatory requirements for the energy efficiency of some product categories.

Products that reach the end of their life (being defective or no longer desired by consumers) are subject to the Extended Producer Responsibility (EPR) minimum requirements which are established in the Waste Framework Directive (WFD)¹⁰⁷. The latter introduces minimum

¹⁰⁵ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12567-Sustainable-products-initiative_en

¹⁰⁶ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0125>

¹⁰⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02008L0098-20180705&from=EN>

requirements for MS to take legislative or non-legislative measures ensuring that manufacturers reuse or prevent, recycle and recover waste. These requirements are implemented differently across MS. For instance, Belgian law stipulates that every shop that takes electronic appliances onto the Belgian market must also ensure collection and processing of the discarded appliances. The law places responsibility of waste caused by replacement of goods on the producer or seller selling goods to consumers.¹⁰⁸ While the EPR does not directly lead to more repairs by consumers, it ensures that waste caused by replacement falls under the responsibility of the actors 'encouraging' replacement.

The recent proposal on ECGT amends the Consumer Rights Directive to ensure that consumers are provided with better information on the existence of commercial guarantees and their duration and coverage. The Directive is expected to increase consumer awareness about the guarantees at the point of sale.

The SGD applies when a defect is present at the time of delivery and becomes apparent within the legal guarantee period (in most MS this means 2 years) and consumers can choose between replacement and repair. Not all defects are covered by the legal guarantee. For example, if the product does not function as advertised on the product packaging, the consumer has a right to a free repair during the legal guarantee period according to the SGD. However, if the consumer due to his own negligence drops the product on the ground, the resulting defect will not be covered by the legal guarantee.

In the absence of EU-wide measures that would ensure take-up of repairs and provide additional protection to consumers beyond the legal guarantee, some MS implemented initiatives at a national level to address this. France introduced a reparability index which came into force in January 2021 with the aim of informing consumers at the point of purchase on the reparability of the product and ultimately make producers manufacture more durable goods.¹⁰⁹ The French model has also inspired the Belgian authorities who are planning to introduce a reparability index by 2024¹¹⁰. Germany has committed to implement the right to repair and overall to improve reparability of products or creating access to spare parts and other measures aiming at prolonging the useful life of consumer goods.¹¹¹

Throughout the product lifetime, the above-presented measures may help to extend the life of consumer goods. However, most measures are implemented at the design/manufacturing stage (e.g. ESPR, SPI) or at the pre-contractual stage, when a consumer decides to purchase a product (ECGT). In the after-sales phase, in the event of a product defect, the consumers can be protected by the legal guarantee and get their products repaired or replaced or rely on commercial guarantees (if these exist) or resolve the issue at their own cost in case the situation falls outside the legal (or if relevant, commercial) guarantee. Hence, none of the current measures in the manufacturing phase, pre-contractual phase or after-sales phase encourages consumers directly to repair their goods in the event of a defect.

¹⁰⁸ <https://www.recupel.be/en/blog/what-is-the-take-back-obligation/>

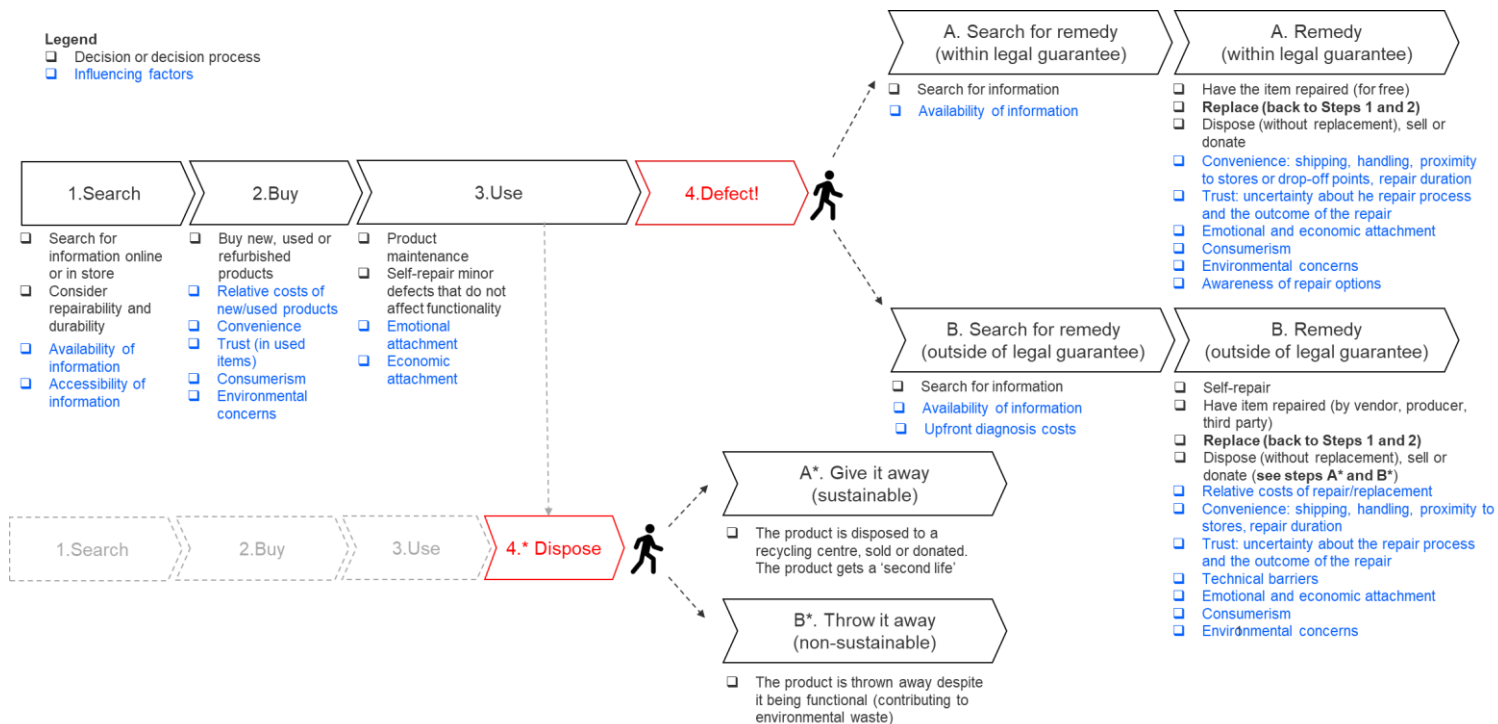
¹⁰⁹ <https://repair.eu/news/one-year-on-has-the-french-repair-index-kept-its-promises/>

¹¹⁰ <https://www.ecoconso.be/fr/content/bientot-un-indice-de-reparabilite-belge>

¹¹¹ <https://repair.eu/news/germany-commits-to-right-to-repair-civil-society-demands-more/>

The figure below illustrates the consumer journey, potential 'hot spots' when consumers could be convinced to repair their defective goods and factors that could influence this decision. While at the pre-contractual stage and within the legal guarantee, consumers could be nudged through additional information campaigns, reinforcing the existing legislation, outside the legal guarantee information campaigns (e.g. on benefits of repairing, facilities, etc.) should be coupled with a stronger legislative framework or other measures which foster such behaviour. This study tests a number of measures that could potentially improve the repair or use of second-hand goods both within and outside the legal guarantee.

Figure 46 - Consumer journey – when can consumers be nudged to repair?



5.2. Policy measures promoting longer useful life of products

This chapter presents the measures considered in this study and that could potentially promote longer useful life of consumer goods through more repairs or use of second-hand / refurbished goods.

5.2.1. Baseline scenario

The baseline scenario to which the projected outcomes of the measures were compared is of a dynamic nature. A 15-year timeframe (2023-2037) was chosen for the impact assessment, as – in line with the practice followed in other impact assessments in the green

transition and sustainability policy domain – this was considered to be a realistic timespan with regard to the continued relevance of the measures. Key (economic, environmental, behavioural) variables and affected businesses' investment horizons are expected to remain more or less constant. 15 years is a time span that allows the various impacts to fully materialise.

The baseline departs from the current situation in the EU in terms of production, sales, and repairs in the 7 selected products groups (without cars) as well as the estimated sales of refurbished goods. This dynamic baseline uses current repair rates obtained from the consumer survey – both under and outside legal guarantee – but considers improvements over the next 15 years, which are driven by EU initiatives that have already been adopted. In addition, the dynamic baseline takes into account the projected market developments of the selected product categories over the next 15 years - it projects the future volume of durable consumer goods sold in the EU on the basis of historic data. This is important as the number of goods repaired (a key factor for the estimation of economic and environmental impacts) is directly related to the model of the quantity of products sold. The projected market developments on the years 2023-2037 were based on historical data on production, import and export of seven selected consumer group categories sourced from Eurostat. The observed change in volumes from 2009-2019 (which was negative for some product groups, i.e. it indicated decreasing sales volumes) was annualised and conservatively discounted by half before applying it to project (negative or positive) market growth between 2023 and 2037.

The number of repaired products was estimated on the basis of the number of products sold in the EU¹¹² multiplied with the applicable repair rate for the product group in question. The repair rate is derived from the consumer survey (2022) and projected to the next 15 years as well. A modestly increasing trend in repairs was assumed for the dynamic baseline, which is consistent with available historical data¹¹³. The annualised average observed increase of the last seven years (2014-2021) was used to project the evolution of repair rates for the next 15 years. This average annual growth rate applied was 0.28%.

Considering that the upcoming ESPR, the ECGT and other European Commission initiatives also aim to improve the repair situation and introduce circular economy measures in the EU, the baseline should reflect the impact of these initiatives. However, when screening the impact assessments of the ESPR and the ECGT initiatives, no specific data was found on the extent to which these two initiatives will quantitatively improve repair. Due to this lack of data on the future repair rate and other potentially relevant indicators for the purpose of this study, a general approach was chosen that reflects market growth and the projected increase in the repair rate based on available statistics presented above.

¹¹² Eurostat PRODCOM database

¹¹³ The preliminary dataset of repair café activities from the Interreg SHAREPAIR project (<https://www.nweurope.eu/projects/project-search/sharepair-digital-support-infrastructure-for-citizens-in-the-repair-economy/>), albeit not representative all types of repairers in Europe, is sufficiently robust to make the assumption of a future increase in repair. Also, market data (including Eurostat Structural Business Statistics) suggests the revenues of the repair sector is increasing. Finally, considering the projected impacts of related EU initiatives (ECGT and eco-design), repair should become easier from a technical perspective and relevant for more goods purchased by consumers.

To calculate the environmental savings from repairs, the approach was taken of identifying the products that do not need to be bought new due to repairs. The environmental savings are then equal to the amount of CO₂, waste and resources that would be generated in the production and disposal of a new product.

Since the number of repaired products does not necessarily correspond to the number of products that do not have to be bought new, the number of repairs was discounted by two factors:

The first factor in the baseline reflects the ratio between the absolute lifetime of a product and the average lifetime extension due to repair. An example explains why this ratio is relevant for environmental savings: A product has an absolute lifetime of 3 years. Repairing it extends the lifetime of this product by one year, but after this period a new product is purchased. Consequently, the environmental benefit is not that of a complete product, but that of a third of a product (1/3).

The second reduction factor reflects the rate of defects that reappear immediately after repair. It is assumed that products that break immediately after repair do not contribute to savings and are therefore not considered to be products that do not have to be bought new due to repair.

Finally, all results of the dynamic baseline were extrapolated to the whole economy with a factor of 5.74¹¹⁴.

The table below gives an overview on the environmental baseline. It shows that around 3 billion products within the selected 8 product groups will be put on the market in the next 15 years. Due to repair, an equivalent of 280 Mio products will be avoided. This equals to 26 Mio tonnes of CO₂-eq., 5.5 Mio tonnes of resources and 3 Mio tonnes of waste that are saved due to repair leading to reduced premature disposal. The subsequent impact assessment (see chapter 5.3) examines how much more savings can still be achieved if policy measures are introduced to promote repair and refurbishment.

The dynamic baseline is different to the 'scale of problem' displayed in chapter 3.3. The scale of the problem considers the total difference between the average consumption lifetime and the absolute lifetime of a product, i.e. it shows the whole problem of premature disposal. The baseline, on the other hand, focuses on the effect of repair activities in reducing premature disposal, considering the projected impact of already proposed EU legislative initiatives and projected future repair rates. Here, the extension of a product's lifetime due to repair activities plays a special role. However, an increased repair rate from a technical perspective alone will not solve the entire problem of premature disposal. For this reason, the "scale of the problem" is much larger than the baseline itself. However, the dynamic baseline is displayed on a 15-years horizon whereas the 'scale of the problem' is a 1-year snapshot.

The environmental baseline analysed is presented below. The last column of the table includes the values that are used as reference in the impact assessment. The colour codes reflect a ranking of the impacts among the product groups whereby red is the highest negative impact and green the lowest negative impact (example on how to read the table: a

¹¹⁴ The method for calculating the extrapolation factor is explained in Annex 3, Chapter 4

huge number of shoes purchases could be avoided due to repair (see red cell in first row), however cars have a greater CO2 saving potential (see red cell in second row)).

Table 31 - Baseline for environmental impacts: current savings (products, CO2, resources, waste savings) due to repair projected for the next 15 years (2023-2037).

		Mobile phones	TVs	Refrigerators	Laptops	Clothing	Shoes	Cars	Wooden furniture	Total of 8 selected products (incl. Cars)	Total of 7 selected products (excl. Cars)	Extrapolation to the whole economy (Factor 5.74)
Number of products whose purchase can currently be avoided due to repair	products	38,391,489	8,568,685	4,616,842	7,496,858	31,007,894	176,750,773	3,077,320	9,239,843	279,149,706	276,072,385	1,584,655,491
CO2 savings due to repair	tonnes CO2-eq	1,238,126	1,315,293	1,505,090	1,777,880	426,979	1,686,202	18,247,094	347,418	26,544,082	8,296,988	47,624,712
Monetisation of CO2 savings due to repair	€	222,862,596	236,752,756	270,916,279	320,018,393	76,856,167	303,516,428	3,284,476,895	62,535,261	4,777,934,774	1,493,457,879	8,572,448,226
Resource savings due to repair	tonnes	2,217	47,539	241,415	14,326	11,876	131,503	4,606,441	429,588	5,484,905	878,464	5,042,383
Monetisation of resource savings due to repair	€	21,185,625	53,884,054	238,376,094	24,552,028	18,003,522	143,160,842	10,747,264,510	5,816,745	11,252,243,421	504,978,911	2,898,578,948
Waste savings due to repair	tonnes	4,060	48,925	281,173	10,504	733,722	80,826	1,678,840	359,994	3,198,044	1,519,204	8,720,233
Monetization of waste due to repair	€	661,703	7,974,824	45,831,251	1,712,233	119,596,691	13,174,608	273,650,900	58,679,006	521,281,216	247,630,316	1,421,398,014

The economic model is calculated with a total production value of EUR 10.7 trillion at producer prices for the relevant (repairable) consumer durables sold in the EU between 2023 and 2037, taking anticipated market growth into account. This calculation is based on the quantities sold in Europe in 2019 for seven product groups, average unit prices and the observed trend between 2009 and 2019 (data obtained from Eurostat's PRODCOM). The observed average annual change in sales has been halved for more conservative future projections. The extrapolation factor of 5.74 has been then added to cover all repairable consumer durables. Of this amount about EUR 4.1 trillion worth of goods will be manufactured in the EU. This volume corresponds to over EUR 16 trillion of retail sales volume (calculated at retail prices).

Furthermore, the dynamic economic baseline calculates that the volume of defective products that are repaired under the legal guarantee is worth 189.9 billion euro and EUR 334.3 billion is repaired beyond legal guarantee.¹¹⁵ The value of defective products, covered by the legal guarantee, that are replaced instead of repaired is estimated to amount to about EUR 241.3 billion over the next 15 years.¹¹⁶ The value of repair as a remedy under the legal guarantee paid by the seller (or manufacturer based on agreements with the seller) is calculated to reach 42.7 billion euro, while the calculated expenditure of consumers on repair outside the legal guarantee is estimated to reach 75.2 billion euro. while the repair and refurbishment of returned products 19.8 billion euro.¹¹⁷ The overall sales value of the returned products that are refurbished and then re-sold (at consumer prices) was estimated to be about 66 billion euro.

5.2.2. Policy measures (exhaustive list)

In order to promote the circular economy, sustainable consumption and to avoid unnecessary waste streams, the period during which consumers use their products is a key. This period is influenced by the product design and its use. Products can be used for a long time only if they are designed by manufacturers in a durable way and if they are used by consumers for as long as possible. The first aspect is tackled by the SPI, which aims at setting binding requirements for producers to ensure that products are designed to be durable and repairable. The second aspect relies on a consumer's willingness to use a product for a long time and on avoiding early replacement or disposal. Our study shows that one of the main causes for premature disposal of goods lies in the difficulties faced by consumers to repair defective products (e.g. due to high cost of repair, repair duration, difficulty to estimate repair price or find repair information) or to purchase second-hand goods (e.g. due to lack of trust or limited protection though guarantees).

¹¹⁵ The calculations were made on the basis of the results of the consumer survey, notably by using the share of consumers who reported that they have repaired a defective product, broken down by the seven product categories, as well as repairs within and beyond the legal guarantee.

¹¹⁶ The proportion applied between repair and replacement in the estimation comes from results of the consumer survey.

¹¹⁷ The calculations are derived from the consumer-survey-based assumption that repairs, on average, are worth 15% of the price of a new product.

The European Commission is considering a number of measures focused on promoting sustainable use of goods, e.g. through incentivising repair within the legal guarantee period and promoting the use of second-hand goods, that could lead to a possible amendment of the SGD.

Furthermore, the Commission is considering establishing a new consumer right to demand repair for situations that are not covered by the current legal guarantee framework, for example when a defect became apparent after two years from purchase or did not exist at the time of delivery but was caused by normal 'wear and tear' or by a consumer's mishandling of the product.

Overall, eleven measures have been considered under this impact assessment of which some are discarded at an early stage. The figure below presents the intervention logic:

Figure 47 - Intervention logic

Drivers	Problems	Objectives	Measure
- Free choice within the legal guarantee favours replacement with new goods in case of defect - Lack of transparency on availability and conditions of repair - Inconvenience factors dissuade consumers from repair - Repair is not economically attractive for consumers outside the legal guarantee	Problem 1: Goods are not used as long as they could because they are not repaired	Sustainable consumption: promoting repair and reuse of viable consumer goods in the Single Market	M1: Repair as primary remedy M2: Preference for repair in a proportionality test M3: Interruption/Suspension of the legal guarantee period M4: Extending the legal guarantee period M9a: Right to repair (Ecodesign products only) M9b: Right to repair (all products) M11: Issuing a repair quote M12: Obligation to inform where to repair M13a: Platform with information on available repair services (national level) M13b: Platform with information on available repair services (EU level) M14: Voluntary commitments to an EU common "easy repair standard"
	Problem 2: Limited use of second-hand goods by consumers		M7: Aligning the legal guarantee period for refurbished second-hand goods with new goods M8a: Replacement with refurbished goods in the extended liability period M8b: Replacement with refurbished goods from the second year of the liability period

The table below provides an overview of these measures in terms of problem to be addressed, assumption of what it should achieve, addressees and the nature of the intervention.

Table 32 - Exhaustive list of policy measures considered

Description of the measure		Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
M1 <i>Repair as the primary remedy</i>	The remedies system of the SGD gives consumers a right to choose between repair or replacement if the product they bought turns out to be defective within the liability period (of at least two years). Under this option the consumer would be only able to ask to replace the product within the legal guarantee period, if repair is not possible or would impose disproportionate costs on the seller	P1	Limit product replacement in cases where repair can be carried out and would not impose disproportionate costs on the seller	Sellers	Horizontal	Within legal guarantee	Amending the SGD	Yes
M2 <i>Preference for repair in the proportionality test</i>	The measure limits the consumer choice to repair instead of replacement in all cases where repair is cheaper or as costly as replacement. The consumer will be able to request replacement only if repair is more expensive than replacement. For example, if a hinge on a fridge breaks down, the seller has a right to refuse to replace the whole fridge (if the consumers wish to do so) as repairing the hinge costs substantially less than the replacement of the entire fridge. Under M2, the current rule would be modified by specifying that the remedy of replacement would be disproportionate, if the costs of repair were lower or equal to those of replacement. As a result, if the costs of replacement were higher than the repair, the consumer could only opt for repair.	P1	Limit product replacement in cases where repair can be carried out and would not impose disproportionate costs on the seller	Sellers	Horizontal	Within legal guarantee	Amending the SGD	Yes
M3	During the legal guarantee period, consumers can choose whether they would like to have their defective product	P1	Make repair more attractive to consumers by extending the duration of	Consumers	Horizontal	Within legal guarantee	Amending the SGD	Yes

Description of the measure		Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
Interruption/Suspension of the legal guarantee period	replaced or repaired, but they could be provided incentives to choose repair by interrupting or suspending the legal guarantee period. ¹¹⁸ Interruption means that the legal guarantee period starts anew once the remedy is offered. For example, if the consumer asks to repair a product, a new legal guarantee period would start to apply after repair. Suspension means that if the consumer decides to repair a defective product instead of replacing it, the duration of the liability period could be extended for the time of the repair.		the legal guarantee when repair is chosen					
M4 Extending the legal guarantee period	The SGD provides for an obligatory minimum 2-year period during which the seller is liable for a lack of conformity which existed at the time of delivery. This measure would extend the duration of the legal guarantee period beyond the current minimum two years for new goods.	P1	Extend the timeframe within which consumers can choose remedies of repair or replacement	Sellers	Horizontal	Within legal guarantee	Amending the SGD	Yes
M5 Extending the burden of proof period	Under this measure, the period during which the product is presumed to be defective at delivery (current period is 1 year) would be extended for new goods.	P1	This measure aims at reducing the uncertainty consumers may have when deciding to get their product repaired/replaced and, in the long term, lead to production of more durable goods	Sellers	Horizontal	Within legal guarantee	Amending SGD	No (see reasoning in Chapter below)

¹¹⁸ Some MS have extended the legal guarantee period by interrupting or suspending it when a defective product is repaired.

Description of the measure		Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
M6 <i>Aligning the liability period of second-hand goods with that of new goods</i>	Current rules under the SGD provide a possibility for MS to allow consumers and sellers to agree on a shorter liability period for second-hand goods (however not less than 1 year). Under this measure, the exception would be removed. As a result, consumers would enjoy the same liability period for both new goods and second-hand goods.	P2	Increase the use of second-hand goods among consumers	Sellers of second-hand goods	Horizontal	Within legal guarantee	Amending SGD	No (see reasoning in Chapter below)
M7 <i>Aligning the liability period of refurbished second-hand goods with that of new goods</i>	As an alternative to M6, the current exception could be maintained partially. However, MS could not allow consumers and sellers to agree on a shorter liability period for refurbished goods. ¹¹⁹ On the basis of the existing laws, market practice and literature, the study also proposes a definition of refurbished goods.	P2	Increase the use of refurbished goods among consumers	Sellers of refurbished goods	Horizontal	Within the legal guarantee	Amending SGD	Yes
M8a <i>Replacement with refurbished goods in the extended liability period</i>	This measure envisages a combination with the measure on prolonging the liability period in context of repair (M3). The replacement with refurbished goods would be an alternative remedy to repair in cases where repair is impossible or causes excessive costs. This measure would only apply in the additional liability period going beyond the minimum liability period of two years (or more depending on MS regime). This measure would not apply in the first two years of the liability period as the consumer may expect as fair replacement only the replacement	P2	Reduce replacement rates of new goods and increase use of refurbished goods	Sellers	Horizontal	Within legal guarantee	Amending SGD	Yes

¹¹⁹ At the moment the concept of 'refurbished goods' is defined in France (at MS level) and the concept of 'refurbishment' in the ESPR (at EU level). The current EU legislation in force does not contain the definition of refurbished goods. For definition developed in this study, please see p. 44.

Description of the measure		Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
	with new goods during that period. After two years, replacement with refurbished goods – where available – could be justified as the goods have already been in use for a considerable time.							
M8b <i>Replacement with refurbished goods from the second year of the liability period</i>	To boost the use of refurbished goods even more, this measure would allow sellers to offer refurbished goods as replacements from the second year of the liability period. When one year has passed, many products are likely to show signs of wear and tear. It could thus be considered as fair to grant the seller the additional possibility of replacing the defective product with a refurbished good, if available.	P2	Reduce replacement rates of new goods and increase use of refurbished goods	Sellers	Horizontal	Within legal guarantee	Amending SGD	Yes
M9a <i>Right to repair (Ecodesign only)</i>	The measure would consist of the introduction of a right to repair for consumers for ecodesign products. Under such a right to repair, the consumer would be able to ask the producer to have the defective product repaired for a reasonable price for a determined period of time beyond the legal guarantee period. As opposed to previous measures, this right would apply to cases when the repair under the SGD is not available. This means that it would cover defects that appear after the legal guarantee period has expired but also those that appear during the legal guarantee period but are not covered by the SGD. The measure would apply to repairable ecodesign	P1	Increase repair of consumer goods outside the legal guarantee, but also defects that occur during the legal guarantee that are not covered by the SGD	Producers of Ecodesign products (manufacturers, importers)	Products for which reparability requirements exist in EU law	Outside legal guarantee	New instrument / new provisions in SGD or in another instrument	Yes

Description of the measure		Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
products (in the scope of the Ecodesign Directive and subsequently, ESPR). ¹²⁰								
M9b Right to repair (all products)	Same as M9a but applicable to all products.	P1	Increase repair of consumer goods outside the legal guarantee, but also defects that occur during the legal guarantee that are not covered by the SGD	Producers of any products (manufacturers, importers)	Horizontal	Outside legal guarantee	New instrument / new provisions in SGD or in another instrument	Yes
M10 Right to claim compensation	Introduction of consumer right to claim compensation from the manufacturer whose products do not comply with the reparability requirements (availability of spare parts and repair manuals, disassembly possibility etc.) for the given product category.	P1	Increase repair of consumer goods outside the legal guarantee and increase accountability of manufacturers for not complying with the reparability requirements	Sellers	Horizontal	Outside legal guarantee	New instrument / new provisions in SGD or in another instrument	No (see reasoning in Chapter below)
M11 Issuing a repair quote	The entity providing repair services (e.g. producer/seller/repairer) would be required to issue a repair quote upon consumer's request. The repair quote should be provided in a standardised form and should comprise certain information such as the duration of repair, any commitment on quality of repair and cost of repair.	P1	Increase repair of consumer goods outside the legal guarantee by providing more information to consumers about the repair conditions (e.g. where to	Repair services and manufacturers/sellers offering repair	Horizontal	Outside legal guarantee	New instrument / new provisions in SGD or in another instrument	Yes

¹²⁰ The obligation to repair could apply to products for which reparability requirements in Eco-design implementing regulations exist or will be adopted

Description of the measure		Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
			repair and the costs of repair)					
M12 <i>Obligation to inform where to repair</i>	Building on a precedent in sectorial EU legislation, this sub-option envisages a horizontal information obligation on producers to inform on available professional repair services. The objective is to facilitate consumer access to information and help identify a suitable repairer for a given product. Such information can be provided at a limited cost by means of references to internet webpages, addresses and contact details of repairers, placed on a free access website, which should be up-dated regularly. This obligation can apply to the manufacturer as provided for in the existing example of a sectorial EU ecodesign rules. The obligation could apply either at the moment As to the area covered, it seems appropriate to limit it to the repair network (in the area where they operate or their own repair network) in order to avoid extra burdens for those businesses targeting more than one MS.	P1	Increase consumers' awareness about the possibility to repair their goods	Producers of any product (manufacturers, importers)	Products covered by the Ecodesign Directive	Outside legal guarantee	New instrument / new provisions in a separate instrument	Yes
M13a <i>Platform with information on available repair services (national level)</i>	This sub-option entails the creation of an online platform with a search engine, matchmaking consumers with repairers for key consumer goods at national level. The purpose is to facilitate the search of suitable repair services and provide more transparency on conditions of repair in order to incentivise consumers to choose repair. This would be an independent comparison tool helping end-users to assess the merits of different repair	P1/ P2	Increase repair of consumer goods outside of the legal guarantee by providing more information to consumers about where to repair and how much it would cost	Repair services	Horizontal	Outside the legal guarantee	Soft measure/ New instrument or new provisions in a separate instrument	Yes

Description of the measure		Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
providers by means of standardised information facilitating comparison of prices and quality parameters.^{121 122} The platform may also include a functionality through which consumers can find refurbished goods in case repair cannot be conducted through the platform.								
M13b Platform with information on available repair services (EU level)	This sub-option entails the creation of a single online platform at EU level with a search engine matchmaking consumer with repairers for key consumer goods. As M13a, the purpose is to facilitate the search of suitable repair services and provide more transparency on conditions of repair in order to incentivise consumers to choose repair. The most efficient implementation would be adding new functionalities to the	P1	Increase repair of consumer goods outside the legal guarantee by providing more information to consumers about where to repair and how much it would cost	Repair services	Horizontal	Outside legal guarantee	New instrument / new provisions in a separate instrument	Yes

¹²¹ A national level platform could be modelled on the 'success story' of such a platform sponsored by the French authorities. It would include a full range of popular consumer goods (e.g., energy-related products, textiles, shoes, furniture, jewellery) and provide matchmaking for consumers and service providers operating in their area. In addition, it would include general information on repair conditions offered by the respective repairer (e.g., average duration of repair, cost range, availability of a replacement product, pick-up/transportation service) but not relating to a concrete problem. MS could decide whether to make the platform accessible only to professional repairers, where professional qualifications are required under national law or also to non-professional repairers (for those types of goods where there are no safety concerns). Professional repairers could be labelled. Where the market has created such platforms, which meet the quality criteria or a relevant national platform already exists, MS should not create new ones.

¹²² The national platforms could be interconnected at EU level with EPREL, which could sign-post to them under 'repair'. It could potentially be listed as 'assistance services' under the Single Digital Gateway, managed by the Commission, facilitate access to such services across the EU through the single-entry point of the Single Digital Gateway and information on Consumer Rights on Your Europe Portal. More synergies with the Your Europe Portal could be achieved by including there a reference to 'where to repair' and signposting to national matchmaking platforms

Description of the measure		Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
M14 Voluntary commitments to an EU common 'easy repair standard'	EPREL portal for energy labelled products. This could be done by adding a search engine, matching consumers with repair services for key consumer goods within the scope of EPREL. For efficiency reasons, the repair information would be limited to the product categories already included in EPREL or regulated under the Ecodesign Directive/ESPR.¹²³ This option involves a voluntary commitment to observe a European standard of quality in repair services. The rationale of a standard at EU level is to boost consumer trust in repair services across the EU on the one hand and avoid market barriers for business on the other hand. In terms of content, it will cover the key aspects of repair services, which evidence identifies as important 'convenience' factors for consumer decisions on repair. They include in particular: reasonable duration of the repair service, availability of a replacement product, availability of pick-up/transportation service and a commercial guarantee on the quality of repair. The measure would set a standardised minimum level of quality on	P1	Boost consumers' trust in repair services and avoid market barriers for businesses	Repair services and manufacturers/sellers offering repair	Horizontal	Outside the legal guarantee	Soft measure	Yes

¹²³ The EPREL portal requires producers to include product related information when placing a product on the market to facilitate market surveillance. Consumers could easily access the portal by scanning the energy label on their product (e.g., a refrigerator) and identify repairers nearby. The take-up is likely to increase as a result of this feature, even among consumers not yet aware of the EPREL portal. Repairers too could benefit by easy access to product information (including on specific models) when approached with a repair request. A platform at EU level could also enable more cross-border repair, especially in cross-border regions or for items that can be shipped at acceptable cost. This would broaden the choice of repair for consumers and promote competition in the Single Market.

Description of the measure	Problem addressed	Assumption on what it should achieve	Addressees	Scope	Within / outside legal guarantee	Nature of intervention	Retained for in-depth assessment of impacts
repair. It will be conducive to consumer confidence, as consumers across the EU could trust that providers with this label address the main consumer concerns about repair in an effective manner. As to the form, the standard could be negotiated as an industry code of conduct establishing minimum standards of repair, agreed by representative business associations at EU level. Consumer organisations and civil society representatives would be involved to ensure consumer concerns and other legitimate interests are considered. The Commission would facilitate negotiations and would help to provide publicity. The code would be open to all types of repair service providers across the EU (including independent repairers and manufacturers). To ensure visibility and consumer recognition, a standardised 'easy repair' label could be developed at EU level and made available to all subscribers to the code. Enforcement of the code would be monitored by the stakeholder group that negotiated the code. One year after enacting the code, the group would take stock and make a statement on its implementation, potentially to be repeated annually.							

5.2.3. Discarded measures

This section provides information on measures that were considered at an early stage of the study but discarded due to various reasons. The measures considered are twofold: 1) measures considered in the experimental design and that were discarded mainly due to lack of feasibility; 2) measures that were discarded from the in-depth impact assessment.

1) Measures considered in the experimental design

The behavioural experiments aimed at observing consumer choice behaviour. Therefore, all the measures not allowing the consumers to have a choice could not be tested in the experiment, but were assessed in the impact assessment through other means (M1, M2, M8).¹²⁴ Within the right to repair measures (M9a/M9b), several configurations were considered in the behavioural experiment, but they were discarded because they could not be experimentally tested (e.g. provide information on product durability, mandate producers to provide spare parts). Some of these measures have been assessed through other data collection tools (e.g. interviews, business survey) and were not disregarded from the assessment.

As consumers tend to have wrong perceptions of the durability of repaired items, awareness campaigns or other means to boost knowledge were considered for the experimental design, to better inform the consumers on these aspects. Such campaigns were also considered for raising environmental awareness and reminding consumers of the ecological consequences of their choices. Disclosure of repairability/repair price information during the purchase of the product was considered as a good incentive for consumers to get their products repaired, but it also had an influence on the consumers' purchasing decisions as they saw the cost to repair upfront. The possibility of providing repairability labels at the point of sale was also considered.

Another option considered in the experiment and in the initial list of options was the obligation for producers to provide spare parts, manuals, etc. to third-party repair service providers. As such obligation already exists under the SPI, this option was discarded from the experiment and the study in order to avoid overlaps.

Some of these configurations might still be relevant in ensuring the overall effectiveness of a right to repair for consumers, should this be implemented (i.e. increasing awareness).

A variation of the display of repair prices is represented in M11, which requires the entity willing to repair a product to issue a repair quote.

2) Measures that were discarded from the in-depth impact assessment

¹²⁴ For instance, M1 and M2 cover consumer remedies and do not provide a choice for the consumer. Therefore, an experimental set-up could not be designed for these measures.

Three measures considered in this study were not considered for the in-depth assessment of impacts due to their early signs of unfeasibility, because they imposed disproportionate costs on the stakeholders or because evidence showed that their benefits did not outweigh their costs. The reasoning for discarding these measures at an early stage is discussed below and it is based on the results of the stakeholder interviews, the survey with businesses and the behavioural experiment.

Measure 5 – Extending the burden of proof period

This measure was perceived as having a positive impact for consumers, as a longer burden of proof period could be a 'nudge' for a longer lifetime. However, burden of proof must rather be seen as a 'sludge' which acts as a barrier to consumers engaging with the return if they must prove something between year 1 and year 2.

This measure could foster unethical behaviours in consumers as these could 'take advantage' with a view to getting products replaced more easily. Under this scenario, this measure would not directly lead to more repairs but rather more waste as replacement rates would increase, hence it would not meet the core objective of increasing the lifetime of products through more repairs.

Businesses consulted through the online survey marked this measure as having the lowest potential in addressing the issue of premature disposal of goods and lead to more repairs under the legal guarantee (58% low-very low potential, 27% high-very high potential, 15% do not know). When looking how different types of businesses perceive the potential of this measure, only retailers of refurbished goods had a more positive perception (50% high-very high potential, 42% low-very low potential, 8% don't know). The other businesses consulted perceived it negatively (retailers of new and second-hand goods and manufacturers).

Furthermore, businesses saw this measure as having a negative impact when it comes to administrative costs – 46% of businesses saw an increase of administrative costs which could be on average 18%. 49% of businesses consulted thought that prices for consumers would increase should this measure be implemented, and the increase would be on average by 14%. Stakeholders interviewed considered that the price increase would be due to higher risks on manufacturers/sellers of receiving claims. Lastly, 43% of businesses saw this measure having a negative impact also on adjustment costs. 29-34% thought that the measure has no impacts on sale of new or second-hand goods.

The results of the stakeholder interviews showed that this measure would impose high costs on businesses while the impact on the environment through more repairs would not be that significant. Under the current formulation, the measure could nudge consumers to use their extended rights in order to get products replaced rather than repaired. This measure was discarded at an early stage due to its low perceived effectiveness in increasing number of repairs during the legal guarantee.

Measure 6 - Aligning the liability period of second-hand goods to newly produced goods

The results of the consumer survey showed that there is a lack of trust in second-hand goods which translates into lower purchasing rates compared with new goods (only 9-25% of

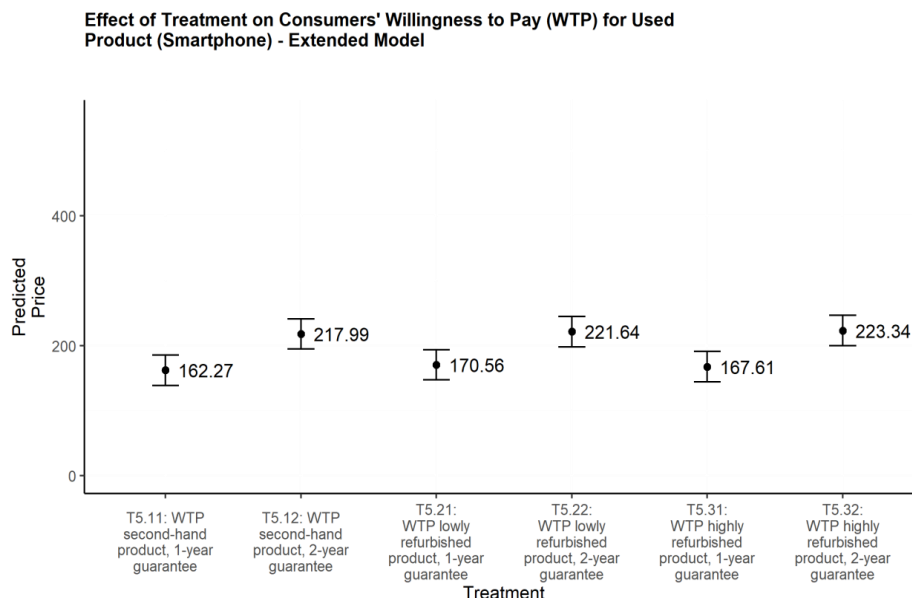
consumers purchased a used good in the last 12 months, depending on the product). Among respondents to the consumer survey, lack of trust in the quality of second-hand and refurbished products was a concern preventing consumers from purchasing such products (12%-20%).

Aligning the liability period of second-hand goods to that of new goods could increase consumer confidence towards second-hand goods (usually perceived as being of lower quality). From an environmental perspective, this would be a positive development as more second-hand goods could be purchased should the confidence increase. These positive impacts were acknowledged by the businesses surveyed, as 48% saw an increase in the sales of second-hand goods as a result of this measure.

The behavioural experiment revealed that consumers value an aligned guarantee period for used products. Of the three types of products tested, the effect of an aligned guarantee period on their willingness to purchase was highest for refrigerators and lowest for shoes. In the consumer survey, respondents estimated that this measure can have an average effect on their behaviour (5.5-6.2 out of 10), when asked to judge the potential impact of this measure on their behaviour on a scale of 0 to 10. However, the experiment revealed that they put in fact a high monetary value on the extended guarantee period. This value had a comparable magnitude for second-hand products, lowly refurbished products (products with some refurbishment carried out), and highly refurbished products (products with advanced refurbishment carried out which includes also preventive repairs and replacements of parts as well as aesthetical improvements to make the product look like new).

This implies that this measure has the potential to increase trust in the quality of second-hand products and increase their uptake on the market.

Figure 48 - Effect of the alignment of the liability period for used goods on consumers' willingness to pay for a used product



Source: Authors based on the results of the behavioural experiment

While the impact on consumer behaviour would be positive, the measure can be seen to have a rather negative impact on businesses. Stakeholders interviewed (e.g. business representatives) thought that second-hand goods cannot be subject to the same rules as

new goods as consumers have certain expectations when buying new goods (e.g. when it comes to durability). Furthermore, companies would not be incentivised to sell more second-hand goods, compared with selling new goods, if the period of liability were the same, as the risk for defects would be higher in the context of the second-hand goods.

Such measure could also create the perception of equal quality between new and second-hand goods and would discourage some actors selling low quality items from participating in the second-hand market. These goods would not cease to be sold but their sales could potentially be shifted to third-countries where the SGD does not apply.

According to businesses consulted through an online survey, the potential of this measure in addressing the issue of premature disposal of goods under the legal guarantee was seen to be low or very low by 52% of businesses, while 32% saw it as having high and/or very high potential and 17% did not know. The negative view is rather consistent across different types of businesses. Only retailers of second-hand goods saw the measure as having high potential but not with an overwhelming majority (50% high-very high, 50% low-very low). In terms of specific economic impacts of this measure, 41% of businesses thought that this measure would translate into an increase in administrative costs and 48% thought that it will lead to an increase in prices for consumers. For instance, administrative costs for businesses could increase by 17% and prices by 18%, according to the businesses surveyed.

This measure could potentially have a positive impact in changing consumer attitudes and trust towards second-hand goods. However, the costs on businesses are too high for the measure to be retained. The risks associated to the provision of protection equal to that of new goods are too high and this might ultimately deter some sellers from selling second-hand goods. Such risks might be translated into higher costs of second-hand goods.

Measure 10 – Right to claim compensation

This measure is generally seen as having a positive impact on empowering consumers to ask for compensation in case the product turns out to be non-compliant with repairability requirements in place. Furthermore, it would add 'additional pressure' on manufacturers to improve compliance with ESPR and deter the manufacturers from placing non-repairable goods in the market. From an environmental perspective, positive effects could be seen in the long-term as companies would be obliged to manufacture more repairable goods in order not to face sanctions linked to potential consumer claims of lack of compliance with repairability requirements.

Despite these perceived positive impacts on consumers and the environment, the measure is seen to be having negative impacts on businesses as well as some fundamental issues linked to its implementation.

Stakeholders interviewed thought that consumers might not be properly equipped to judge whether a product meets the repairability requirements or not. Businesses would see a high increase in costs linked to dealing with a high number of claims (administrative costs), and most of these claims could lack foundation in the absence of a proper mechanism to assess lack of conformity with repairability requirements.

Results of the business survey showed that this measure is perceived as having low or very low potential (47% of businesses share this opinion) in addressing the premature disposal of goods and lead to more repairs outside the legal guarantee (39% think it would have high or very high potential while 14% don't know). When breaking down these results by stakeholder type, we noticed that positive results are driven by answers provided by refurbishers, independent repairers and retailers of refurbished / second-hand goods. Authorised repairers, retailers of new goods and manufacturers saw this measure having low to very low potential.

Generally, businesses saw an increase in administrative costs (55% of businesses saw an increase which could go up to 16%) and prices for consumers, should this measure be implemented (52% of businesses saw an increase which could go up to 17%). Furthermore, a considerable adjustment costs on businesses may also incur. No considerable impact was seen on sale of new goods (only 19% see an increase) while sales of refurbished / second-hand goods and revenues of repair services may increase as a result of this measure.

Non-compliant manufacturers would incur high costs in re-adapting their processes in order to fulfil requirements and avoid sanctions. The measure could also disincentivise importers from importing products that do not fulfil these requirements.

Lastly, significant administrative costs could be placed on market surveillance authorities. Some of these costs were anticipated by the changes brought by the ESPR on repairability requirements, but this measure could place additional burden on market surveillance authorities if consumers were allowed to judge by themselves whether a manufacturer is compliant or not (potentially high number of unjustified claims).

Overall, this measure could have a long-term positive impact from an environmental perspective as it would 'force' manufacturers to comply with the requirements in place in order not to face penalties. The effectiveness of this measure is heavily hindered by the lack of a clear mechanism in place to claim compensation and assess repairability. On the latter, this should not be left to the consumers as they are not completely aware of the legislation around repair. The measure could also lead to 'unethical' behaviours from the part of consumers who could make unfounded claims in exchange for the compensation.

5.3. Assessing impacts of retained policy measures

In line with the EC's BRG's on how to carry out an Impact Assessment¹²⁵, this chapter assesses the impacts of the retained policy measures. As a first step, all the potential impacts associated to the measures are reviewed and only the ones which show high expected magnitude are retained for further assessment. Further, an in-depth assessment of these impacts per measure is carried out, building on the assessment of costs and benefits. The comparison of measures shows how these perform against each of the impacts retained.

¹²⁵ https://ec.europa.eu/info/sites/default/files/br_toolbox-nov_2021_en_0.pdf

5.3.1. Screening of impacts

In line with the European Commission's BRG on how to carry out an Impact Assessment¹²⁶, we identified all impacts that could potentially be associated with the measures that were retained for the in-depth assessment of impacts. These impacts were informed by the stakeholder consultation (interviews, business survey, consumer survey and experiment) combined with expert inputs and literature. This list was based on the BRG's long list of impacts as set out in Tool #19.

The table below presents the exhaustive list of impacts considered for the measures. The screening of economic, social, and environmental impacts that the proposed measures may produce for various types of stakeholders was assessed based on:

- Likelihood – the prospect of these impacts occurring, combined with availability of information to measure such likelihood.
- Relevance of these impacts to stakeholders as a result of implementation of these measures.

The link to the EC objectives or the extent to which the impacts are aligned with the EC objectives under this study (e.g. to increase the lifetime of consumer goods through more repairs and use of second-hand goods) is also assessed.

Most impacts screened are relevant across the measures retained for in-depth assessment of impacts and are assessed collectively in the table below... The retained sub-criteria for impact assessment are those producing most significant impacts, of relevance for most key stakeholder groups concerned by the measures. The retained sub-criteria for the cost-benefit and multi-criteria analysis (MCA) were also selected so as to avoid overlaps and duplication, while quantifying the significant impacts as far as possible.

¹²⁶ https://ec.europa.eu/info/sites/default/files/br_toolbox-nov_2021_en_0.pdf

Table 33 - Significance of impacts for all the policy measures considered for in-depth assessment

	Possible / significant impacts	Likelihood	Relevance for stakeholders	Link with the objectives	Comment	Retained (✓)
Economic	Growth and investment	**	**		Growth and investment are EU priorities and some of the measures may involve considerable investments in repair capabilities in-house sub-contracting, or investment in development of new repair services within the Single Market. The need for arranging repair services may incur administrative burden for some businesses, namely those concerned by the respective measures. The measures might lead to development of new business models or change in the current ones as businesses will have to rethink the way in which they carry out business (e.g. new opportunities to develop in-house repair services).	✓
	Trade and investment flows	*	*		Some measures might foster investment in repair services (i.e. staff, infrastructure) and trade flows might be impacted in terms of demands for spare parts, etc.	
	Facilitating SMEs growth	***	***		SMEs account for the vast majority of businesses in the EU; hence the options can potentially impose additional burden on companies especially where repair practices are not currently in place. SMEs (manufacturers and retailers) would need to compensate for this lack of services. On the other hand, SMEs operating in the repair sector are estimated to benefit from all measures as all are expected to increase repair rates among consumers.	
	Savings in production costs for manufacturers	**	***		Currently consumers have no protection outside the legal guarantee aside from the commercial guarantee which they would acquire at their own cost. Some MS started or planning to implement measures to encourage consumers to repair their defective goods (e.g. France, Belgium, Germany). The measures considered may lead to savings in production costs for manufacturers. Some of the measures examined promote repair over replacement as a remedy under the legal guarantee. If repair is chosen more frequently than replacement, business savings can be achieved based on avoided replacement with new goods, where repair is cheaper as a remedy. These savings are relevant for the seller as the party formally bearing the costs for the free remedies consumers receive under the legal guarantee. In practice though B2B agreements between sellers of consumer goods and manufacturers often shift these costs to the manufacturer. A simplified assumption is used for the purpose of the estimates of impacts, presenting the combined business savings (for sellers and manufacturers) as savings of production costs for manufacturers.	
	Increased innovation and research / technological development	*	**		Some measures could indirectly lead to companies designing more repairable goods in the long term (in addition to effect of other policy measures such as the SPI, ESPR, etc.). However, this might lead to additional costs for businesses to change their current processes / business models.	
	Increased international trade and investment	**	**		Measures could lead to an increase demand for spare parts from non-EU MS and export of second-hand goods in third countries.	
	Business adjustment costs	***	***		Businesses may need extensive efforts and time to understand the new rules and formulate appropriate responses, resulting in direct costs linked to adjustment to the new rules. This includes reorganising internally in order to	✓

Possible / significant impacts	Likelihood	Relevance for stakeholders	Link with the objectives	Comment	Retained (✓)
				respond to new demands and ensure compliance with new measures (e.g. organise in-house repair services or sub-contract repairs). These costs will vary per measure.	
Business administrative costs	***	***		Businesses may incur costs due to the need to comply with information requirements under some options (other than costs relating to adjustment).	✓
Enforcement costs for administration	**	***		The competent authorities for enforcement will have to familiarise themselves with the new measures and monitor application and compliance by the economic operators concerned by each measure. New measures could also lead to increased demand for public authorities to respond to consumer complaints linked to potential lack of compliance with the new rules. Furthermore, public authorities will play an important role in raising citizens' awareness about their rights which will entail costs for awareness raising campaigns.	✓
Consumer prices and choices	***	***		Business adjustment costs and administrative burdens can translate into higher prices for consumer goods (new or second-hand). Measures could have an impact also on the repair prices.	
Consumer decision making process	***	***	✓	Some measures have the potential of improving consumer decisions to repair their defective goods instead of replacing them, while others may limit it.	✓
Consumer savings	***	***	✓	Some measures could lead to consumers savings, as they would save money where they do not buy new goods but repair their defective products or alternatively buy cheaper second-hand/or refurbished goods.	✓
Social					
Employment	**	***		Measures could have a direct impact on creation of new jobs, in particular in the repair sector. Current jobs might also be impacted by changes in business costs and investments but that it would be difficult to quantify.	✓
Income distribution and social inclusion	*	*		The price of some goods might increase in order to accommodate the new requirements for businesses. Companies producing cheaper products (and of lower quality) could potentially increase their production costs (and prices) in order to make their goods more durable / repairable.	
Health & safety	*	*		Negative environmental impacts can impact health of citizens. All measures are expected to have a positive environmental impact which will benefit citizens' health. These aspects are covered in the assessment of environmental impacts.	
Governance & good administration	*	**		This aspect links to the enforcement costs for administration.	
Social protection, health, and educational systems	*	*		No aspects linked to social protection, health, and educational systems were identified.	
Cultural heritage	*	*		No aspects linked to cultural heritage were identified.	
Consumer trust and protection	***	***	✓	Measures are expected to boost consumer trust in second-hand and refurbished goods, as well as improving trust in repair services and repaired goods. Furthermore, measures will contribute to improving consumer protection, in particular outside the legal guarantee where currently protection is limited, should such measures be considered.	✓
Environmental					
Contribute to fighting climate change	***	***	✓	Some measures are expected to extend the useful life of consumer goods through increased repairs and less replacement of goods, increased use of second hand and refurbished goods. These behaviours may lead to a reduction in the CO2 equivalent emissions associated with production and consumption.	✓

	Possible / significant impacts	Likelihood	Relevance for stakeholders	Link with the objectives	Comment	Retained (✓)
	Fostering the efficient use of resources (renewable & non-renewable)	***	***	✓	All measures can potentially reduce replacement rates and hence reduce the use of resources for production of new goods.	✓
	Sustainable consumption & production	**	**	✓	The measures have a direct impact on sustainable consumption as it aims to increase repairs and use of second-hand / refurbished goods. As for production, measures could indirectly impact companies' manufacturing processes in order to produce more durable / repairable / recyclable goods. However, this impact on the production cannot be assured by these measures alone, so in addition more targeted actions, such as ESPR or the SPI, are needed.	
	Quality of natural resources/fighting pollution (water, sol, air, etc.)	**	**		No measurable impacts on the quality of natural resources have been identified at this point. Measures aim at indirectly fighting pollution by reducing premature disposal of goods (as discussed above when discussing climate change).	
	Protecting biodiversity, flora, fauna, and landscapes	**	**		No measurable impacts on the protection of biodiversity, flora, fauna, and landscapes.	
	Waste production, generation, and recycling	**	***	✓	Measures are designed and thought to have a direct impact on reducing waste production as consumers will generate less waste by using their goods for a longer period. Furthermore, some measures aim at fostering the repair of goods for further use by the same consumer or by giving it a second life and selling it on the second-hand market. As discussed above, some measures should indirectly impact manufacturing processes as companies will have to produce more repairable goods.	✓
Overarching impacts	Economic and social cohesion	*	*		Economic and social cohesion could potentially be impacted by the measures, but this impact is indirect and difficult to measure.	
	Impacts in third countries	*	*		The measures assessed also impact the EU sales of new goods produced in third countries as consumers would buy fewer new goods (produced in third countries) when repairing or buying second hand or refurbished goods. Some measures could have a direct impact on the sales of second-hand goods as more stringent rules envisaged by some measures could dissuade sellers from selling certain products on the EU market and hence sell them elsewhere where these new EU rules are not applicable. However, the impacts associated with the business decisions of third countries' traders are difficult to predict at this stage.	
	Sustainable development and circular economy	***	***	✓	Measures will have a direct impact on circular economy and sustainable development as it will increase the number of repairs and use of second-hand goods.	
	Fundamental rights	*	*		No significant impacts on fundamental rights were identified.	
	Application of the EU level consumer framework	***	***	✓	Some measures will improve consumer protection within the legal guarantee and others will extend consumer protection in areas where legislation provides with little or no protection to consumers (in particular outside the legal guarantee). Furthermore, some measures aim at ensuring that consumers have sufficient information that can help them take a better-informed repair decision (e.g. on measures clarifying price, duration, and other conditions of repair)	✓

5.3.2. Impacts of the policy measures and how they compare

This chapter assesses the impacts of the various policy measures as guided by the intervention logic. The assessment combines qualitative and quantitative data where quantitative data is available. Quantitative data stems from our own calculations based on literature review and data collected through the business survey, consumer survey and behavioural experiments. In particular, the assessment of environmental impacts and economic impacts (costs and benefits) is based on a model which connects a ranking of the analysed measures (mainly based on business and consumer survey outcomes) with the estimated lifetime extension potential of these same measures. A detailed explanation of the models and its underlying assumptions is provided in Annex 3 – chapter 2 to this report.

The monetised costs and benefits of each measure considered in the assessment are incremental to those of the baseline, which were assigned EUR 0 in the relevant cost categories. Where a quantitative assessment could not be carried out, each policy measure receives a mark on a scale from -5 to +5, with 0 being the baseline.¹²⁷ Whenever a measure leads to an improvement of the situation compared with the baseline, a grade above 0 is provided. On the contrary, if the measure leads to a deterioration of the situation compared with the baseline, it receives a grade below 0 (proportionate to the impact).

For easier understanding of the impacts, the table below recaps the 14 selected sub-criteria with most significant impacts against which all the measures were assessed. As some sub-criteria resulted in partial overlaps with others the more general sub-criterion, which reflected the costs and benefits of sub-criteria was selected to avoid duplication of costs and benefits in the economic model. For instance, 'growth and investment' was quantified and included as the more general criterion. While the sub-criteria of 'facilitating SME growth' and 'trade and investment flows' are also relevant, they were not included separately in the economic model to avoid duplication of estimates. These are all linked with the high-level assessment criteria of effectiveness, efficiency, and coherence.

Table 34 - How impacts help measure effectiveness, efficiency, and coherence

Effectiveness		Efficiency		Coherence	
Sub-criteria	Stakeholders affected	Sub-criteria	Stakeholders affected	Sub-criteria	Stakeholders affected
Consumer decision making process	Consumers	Growth and investment	Manufacturers Sellers Repairers	Coherence with the EU level consumer framework and other relevant EU law	Consumers Sellers and manufacturers
Fostering the efficient use of resources (renewable & non-renewable)	Consumers Manufacturers Environment	Savings in production costs for manufacturers	Manufacturers		
Contribute to fighting climate change	Environment	Business adjustment costs	Manufacturers Sellers Repairers		
Waste production,	Consumers Manufacturers Sellers	Business administrative burdens	Manufacturers Sellers Repairers		

¹²⁷ Only two criteria were assessed qualitatively: coherence with other EU legislation and consumer trust and protection.

generation, and recycling	Environment		
Consumer trust and protection	Consumers	Enforcement costs for administration	Public administration
		Change in employment	Consumers
		Consumer savings	Consumers

To assess the impacts of the policy measures, several assumptions have been used. These assumptions are based on various sources, ranging from existing literature and data, consumer survey, behavioural experiments or business survey carried out as part of this study.

The problem definition (see Chapter 3) provides a comprehensive analysis of the drivers of the premature disposal of consumer goods as well as the scale of this phenomenon. Some data collected for the study were used to make some assumptions, which were necessary for assessing the impacts of the policy measures. The main assumptions are:

- **Assumptions on incidence of repairs** among European consumers were made based on the results of the consumer survey. For instance, between 12% and 33% (depending on the product) of consumers reported that they experienced defects that resulted in the product not working properly. In the following question respondents were asked which actions they had taken in respect to their defective product. For some products, replacement remains the most recurrent remedy, but many consumers do repair their products. 63% of product owners that experienced a defect of their car had it repaired, which is understandable due to high replacement costs of cars. The least repaired products are clothes (19%), wooden furniture (23%) and shoes (24%), while electronics and home appliances are repaired in 28%-36% of cases. These survey findings also allow us to document the share of consumers who replaced their defective products. Of the consumers that experienced defects, the share of those who replaced their products ranges between 24% (laptops) and 39% (refrigerators).
- **Estimations about repair rates in society** were based on the actions consumers reported they had taken when they experienced a defect. The results of the consumer survey were used to estimate the repair rates among product owners, or, in other words, the share of products that on average get repaired among all defects that occur. Among all product owners across the range of tested products (not including cars), on average 4.9% experience a defect of their product per year and had the products repaired.
- **Estimations about the share of repairs that were carried out within the legal guarantee** were also based on the consumer survey. Of those consumers who experienced a product defect, 41% claimed that the defect occurred during the legal guarantee period. The share of defects outside the legal guarantee was estimated based on the reason for the defect that consumers reported in the survey. The reasons were classified into those which would indicate that the seller is liable under the legal guarantee and those for which with high likelihood the consumer is at fault (e.g. defects due to impact or shock). If the defect was associated with a reason that would qualify for the legal guarantee and if it occurred within the legal guarantee

period (2 years), it was considered as a defect within the legal guarantee. Conversely, defects for which other reasons were reported or that did not occur within the legal guarantee period were considered as defects outside the legal guarantee. Considering only defects that occur under the legal guarantee period and should be covered by the scope of the legal guarantee, 0.8% of product owners experiences such a defect and had their product repaired.

- **The assumptions about consumers' reasons for not having defective products repaired** are based on the consumer survey results. Reported reasons for not having products repaired are various, with most recurrent being the high cost of repair (34%), followed by consumers' willingness to buy a new product rather than repairing the defective products (21%), repair duration (14%), the effort needed by consumers to have the product shipped (14%), lack of repair services (12%), impossibility to estimate the repair price (11%), lack of a replacement product consumers could use during the repair period (10%) or lack of information on where to repair (9%). These reasons were reported by consumers in the survey in the section that asked about the actions they had taken when they experienced a defective product.
- **The experience of consumers with repairs** is also based on the consumer survey results. Of consumers that repaired their products, the biggest share of respondents was **satisfied with the quality** (between 43% and 53% satisfaction rate, depending on the product). The price of repair is clearly a barrier for consumers and results of the consumer survey show that consumers' **willingness to pay for repair** is between 21% and 32% of the initial price (depending on the product).
- **Results of the consumer survey show that some consumers are more open to repair than others.** Based in the answers to the consumer survey, we divided the respondents into different segments. This analysis gives an indication of how many respondents are open to repair and likely to repair goods. Based on their answers, respondents were classified into four groups:
 - Enthusiastic repairers: had defective products repaired and show high level of affinity to repair
 - Reluctant repairers: had defective products repaired and show low level of affinity to repair
 - Reluctant replacers: had replaced a defective product and show high level of affinity to repair
 - Enthusiastic replacers: had replaced a defective product and show low level of affinity to repair

The results show that overall, 42% of participants are in the category of 'enthusiastic replacers', while 12.8% are classified as 'enthusiastic repairers'. A share of 36.1% are classified as reluctant repairers, meaning they repaired although they have a low affinity to repair defective products. On the other hand, 9.3% fall into the category of reluctant replacers, meaning they have replaced a defective product, although they have a high affinity to repair.

When the segmentation is applied to the analysis of the experimental results, we observe that nearly all measures that had a significant effect on the population also had a significant effect on the individual segmented groups. This means, even 'enthusiastic replacers' can be nudged by some of the measures towards repair of defective product, although the effect is considerably smaller than for the other groups.

The take-up rates considered in the impact assessment are the average take-up rates across all consumer segments and thus should adequately reflect the behavioural change we can expect in the total of the adult population.

- **Consumers' purchase rates of second-hand goods are rather low** (14%) on average, with clothing seeing the highest rate (25%) and refrigerators the lowest (9%).
- **The main reason for not buying used products** is consumers' lack of need for such products (31%), followed by consumers' preference for new products (28%), lack of trust in refurbished or second-hand goods (20%) and the shorter or lack of guarantee period for these products (14%).
- **Several assumptions were made to estimate impacts on the environment**¹²⁸
These are presented in the table below while the data is available in Chapters 3 and 4 of this study. The results of the environmental impacts of the measures considered in the impact assessment have been the basis for the calculation of economic impacts (see Annex 3 – chapter 2 for more details).

For ease of reading, these assumptions are summarised in the table below per impact criterion, while in-depth explanations can be found in Annex 3 of this report.

¹²⁸ A detailed description of the environmental impact assessment model and the underlying assumptions can be found in Annex 3. The Annex also displays all numbers and values used in the model. The results of the model are on a yearly base.

Table 35 - Summary of assumptions made, and data used to assess impacts

	Type of assessment	Main assumptions made to assess impacts	Sources of information	For more information, see:
Consumer trust and protection	Qualitative	The assessment of consumer trust and protection was carried out in a qualitative manner (in the absence of quantitative information). This assessment is based on stakeholder views and the study team's views on the extent to which the measures lead to an increase/decrease of consumer trust and protection.	– Expert interviews – Literature	Annex 3 'Detailed assessment of impacts'
Consumer decision making process	Quantitative	As a first step, the assessment of measures on consumer decision-making process was based on the results of the behavioural experiment and results of the consumer survey on the potential of measures to increase consumers' take-up of repair (or other sustainable remedies). Secondly, the consumer decision-making process was quantified. For measures within the legal guarantee this was done by calculating the production of new products avoided (in units) This= represents the number of products whose purchase/production would be avoided, because they will be repaired instead of being replaced with new products (free of charge within the legal guarantee). For measures relating to refurbishment, the indicator reflects avoided purchases of new goods in cases where refurbished goods were used instead.). Then, the indicator is modified with a lifetime extension factor (this significantly reduces the number of product purchases that can actually be avoided) and then a 7-14% deduction (depending on the product group) for products that will need to be repaired instantly for recurring defects. For measures beyond the legal guarantee, the indicator used is number of additionally repaired products. It reflects consumer decisions to repair their own products at their own cost instead of purchasing new ones in the event of a defect.	– Behavioural experiment – Consumer survey – Eurostat	Annex 3 'Assumptions made for repair take-up rates'
Consumer savings	Quantitative	This is measured by the change in the net financial position of consumers in the form of potential consumer savings originating from changes in the amounts spent on the purchase of new or refurbished products and cost of repair. The retail prices are derived from producer prices and a 50% retail markup (this includes the markups of importers and distributors, and any further costs including logistics and insurance premia). Average producer prices are calculated using Eurostat PRODCOM data	– Eurostat data – Literature – Web search	Annex 3 'Additional data and explanation of estimates of economic impacts'

	Type of assessment	Main assumptions made to assess impacts	Sources of information	For more information, see:
Growth and investment	Quantitative	The measure is the sum of changes in the gross value added (GVA) generated by EU manufacturers, sellers, and repairers. This is estimated via a comprehensive model based on Eurostat PRODCOM data including, survey data on repair and replacement rates, and a series of (literature and web-search-based) assumptions on business behaviour with regard to repair and replacement, re-selling refurbished goods, as well as price discounts and retail markups.	– Eurostat data – Literature – Web search – Consumer survey – Consumer experiment	Annex 3 'Additional data and explanation of estimates of economic impacts'
Savings in production costs for manufacturers	Quantitative	The estimate refers to the value (measured at producer prices) of replacement goods that would have been offered under the baseline scenario as a remedy for defective products under the legal guarantee, but do not have to be offered anymore under the measure in question. It is calculated on the basis of the estimated volume of additional repair instead of uncompensated replacement. The volume of baseline and additional repair is estimated on the basis of the consumer survey and experiment. Average producer prices are calculated using Eurostat PRODCOM data	– Eurostat data – Consumer survey – Consumer experiment	Annex 3 'Additional data and explanation of estimates of economic impacts'
Business adjustment costs	Quantitative	Adjustment costs for compliance with new measures have been estimated on the basis of the type and number of business entities (manufacturers, sellers, repairers) affected by a given measure, which was sourced from Eurostat with additional assumptions on the share of entities relevant for the measures; as well as estimated cost per entity or time need to carry out certain activities for adjustment (based on business survey, other impact assessments and expert judgement) and average hourly labour cost for administrative work sourced from Eurostat.	– Eurostat data – Web search – Business survey	Annex 3 'Additional data and explanation of estimates of economic impacts'
Business administrative costs	Quantitative	The same approach as to 'Business adjustment costs' above has been applied, but only with reference to measures containing information obligations	– Eurostat data – Web search – Business survey – Consumer experiment	Annex 3 'Additional data and explanation of estimates of economic impacts'
Change in employment	Quantitative	Based on the estimated change in personnel cost, which comes from the projected change in sales volumes multiplied with Eurostat SBS data on personnel cost as percentage of sales for manufacturers, sellers and repairers in the sectors concerned. Annual personnel cost estimates were divided by 25,000 to estimate the change in jobs. The value is a rough average of personnel cost per employee figures from Eurostat for manufacturing for various product groups, for retail and individual repair sectors.	– Eurostat data – Web search	Annex 3 'Additional data and explanation of estimates of economic impacts'

	Type of assessment	Main assumptions made to assess impacts	Sources of information	For more information, see:
Impacts on public administration (enforcement costs)	Quantitative	The impact on public administration is reflected in the enforcement costs that the authorities must bear in order to implement and monitor the measures. The impacts are calculated based on an assumed number of FTE required to monitor and to carry out inspections, resources required for raising awareness of measures and the costs (where applicable) of software and maintenance. When it comes to inspections, the share of businesses that require inspections was weighted in the calculations (e.g. it is assumed that inspection costs for measures targeting sellers are higher).	– Eurostat data – Business survey – European Commission (previous studies)	Annex 3 'Additional data and explanation of estimates of economic impacts'
Contribute to fighting climate change Fostering the efficient use of resources (renewable & non-renewable) Waste production, generation, and recycling	Quantitative	The assessment of the three environmental impact categories was carried out in a quantitative manner. The baseline and the impact assessment are based on the same data basis (based on repair rates leading to the number of product purchases that could be avoided). The number of repaired products is different for every product category and every measure taking into consideration that some measures are dealing with defects within the legal guarantee and some - outside the legal guarantee. The factor 'increase in the use of repairs due to the measure' is the crucial factor to show how the impacts of the measure would compare to the baseline. This factor is different for every measure and is mainly derived from the business and the consumer survey. For M1 and M2 this factor was discounted by the number of 'end of life' products that cannot be repaired technically or where repair does not make sense economically. Moreover, the impact assessment has a built-in impact realisation profile estimating that the impacts will not materialise 100% in the first years. The environmental impacts are displayed in CO ₂ -equivalents, tonnes and EUR and represent a 15-year time span. The impacts were assessed for 8 selected product types and then extrapolated to the economy with respect to consumer goods.	– Literature – Consumer survey – Business survey – Data provided from Sharepair¹²⁹ – Educated guess	Annex 3 'Additional data and explanation of estimates of environmental impacts'
Coherence with other EU legislation	Qualitative	The assessment of coherence with other EU legislation was done qualitatively. It reflects the study's legal experts' views on the coherence of individual measures with existing legislation.	– Expert interviews – Educated guess	Annex 3 'Detailed assessment of impacts'

¹²⁹ The data is based on preliminary data from the Sharepair database. Website of the Sharepair project: <https://www.nweurope.eu/projects/project-search/sharepair-digital-support-infrastructure-for-citizens-in-the-repair-economy/>

5.3.2.1. Problem 1: Goods are not used as long as they could be because they are not repaired

This section assesses the impacts of all the measures aiming at addressing the issue of goods not being used as long as they can because they are not repaired. More information about the results of the experiment or consumer survey can be found in Annex 1, while Annex 3 provides more information on the methodology deployed to calculate impacts of the measures.

Impacts on consumers

All measures relating to problem 1 aim to increase the likelihood of consumers to have defective products repaired. Taking the consumer journey into account, there are several stages in the consumers' decision-making process where such measures would take effect. The main impacts of these measures on consumers highly depend on the measure in question. This can be better consumer protection from bearing the costs of replacement or repair due to a longer legal guarantee periods (M3 and M4), creating a new right to repair products beyond the legal guarantee (M9a and M9b) or making repair generally easier and more accessible (M11, M12, M13a and M13b, M14). On the negative side for some consumers some measures prioritise repair of a defective good as a remedy (under legal guarantee) instead of replacement that those consumers might have preferred (M1 and M2). Such measures limit the choice of remedies for consumers under the legal guarantee. The study has shown that some consumers express a strong preference for new goods, as they lack trust or are generally against the re-use of repaired products. Even measures which propose repair as an alternative to replacement (e.g. M1, M2, M9, M11), and that have an overall positive impact on consumers (in particular consumer savings, more choice and better access to repair possibilities) can be coupled with some negative effects linked to repair, as repair might require additional time, effort and money on consumer side, compared with the replacement of the defective product.

In terms of consumer rights, the comparison of measures highlights considerable differences between measures. Several measures would bolster or even increase consumer rights. This is most notably relevant for the 'Right to Repair' (M9), but also the interruption or suspension of the legal guarantee period (M3), the extension of the legal guarantee period (M4), the requirement of producer, sellers, or repairers to issue a repair quote (M11) and obligation to inform where to repair (M12). In turn, measures that propose repairs as primary remedy (M1) and a preference for repair in the proportionality test (M2) will de facto limit the choice of consumers and thus reduce their rights as consumers in the repair situation. The measures that increase the transparency in the market, such as the platform with information on available repair services (M13a and M13b) and the voluntary commitments to a common EU 'Easy Repair' standard (M14) could also potentially improve the position of consumer and thus indirectly support them in their rights.

In terms of behavioural impact, the measures can be expected to have a varied influence on the consumer decision-making process. Based on the expert interviews, there is a strong expectation that the measure that proposes repair as the primary remedy (M1) and preference for repair in the proportionality test (M2) will not significantly impact the behaviour of consumers. The reason is that under these two measures, the choice as to whether to repair or not is regulated by law. These measures would limit the choice for consumers, and

they would have little to say in the decision-making process on the remedy. The decision on the remedy would largely depend on the seller, who would be best placed to determine the proportionality of the repair costs vis-a-sis the costs for a replacement of the defective product.

The behavioural experiment provided strong evidence on the effectiveness of the measure that proposes an interruption or suspension of the legal guarantee period (M3). Consumers were considerably more likely to choose repair when the legal guarantee period was suspended and set to re-start after the repair has been carried out. This effect was significant for all three types of products tested (smartphones, refrigerators, and shoes). It should be noted that the behavioural effect only occurs when the suspension is offered for the repair only and not at the same time for the replacement. If the guarantee restarts equally after repair or replacement, there is no positive effect towards encouraging consumers to have their defective products repaired. While the experiment revealed a significant behavioural effect of the scenario in which the guarantee period is suspended, the interruption of the legal guarantee period had no significant effect on the behaviour of the parties in the experiment.

For the measure that offers an extension of the legal guarantee period (M4), the behavioural experiment also showed that extending the legal guarantee period only for repairs beyond the current two years had a strong effect on consumers' likelihood to have their product repaired. Conversely, this measure decreased consumers' likelihood to have the product replaced at their own cost, as consumers would like to benefit from free remedies under the legal guarantee. The unequal extension of the guarantee period provided a strong behavioural incentive that shifts consumer behaviour towards repair. When the guarantee period was extended for both repair and replacement, consumers were less likely to choose repair over replacement.

The impact of the 'Right to Repair' (M9 a and b) on consumer behaviour was tested in a separate experiment (see Annex 1). The experiment revealed that the right to repair would have a very strong effect on consumer choices compared with the current situation under which consumers cannot claim from sellers or producers to have defective products repaired outside the legal guarantee for a reasonable fee and within a determined period of time. Furthermore, the level of the fee for repair led to varied interest of consumers to repair. The level of 'reasonable fee' was the single most important factor that influenced the behaviour of consumers in the experiment. This confirmed the views expressed in the expert interviews that the magnitude of the impact of this measure depends very strongly on the definition of the 'reasonable fee'.

As part of the behavioural experiment, the study also gathered evidence on the extent to which the costs connected to the repair quote (M11), affect the level of repair. Furthermore, the experiment allowed to estimate the magnitude of the behavioural impact from such diagnosis. Under the assumptions of the experiment, we were able to estimate the optimal price for the repair quote and found that this should not exceed 5% of the product value. Such optimal price can be expected to have a significant behavioural impact that enables more consumers to choose to have their product repaired. Indeed, having to disburse money to get a quote for repair is a clear disincentive for seeking repair. After receiving the information on how much the repair would cost, an equal share of respondents would commission the repair, independent from the diagnosis costs. Among those who originally said they would not commission the diagnosis (not willing to pay for a quote), around half

would commission the repair after they received the information on how much the repair would cost. Subsequently we see that:

- The monetary cost of seeking a quote for repair is a significant barrier to the take up of repair;
- The convenient availability of a quote on the other hand is a boost for uptake of repair even for those who originally were not willing to pay for the costs of a quote.

Based on the second behavioural experiment, we assessed the potential impact on consumer behaviour of the measures that address mainly information gaps related to consumer choices. The highest impact on consumer behaviour can be expected to follow from the measure on the platform with information on available repair services (M13). Other measures, such as the voluntary commitment towards an 'Easy Repair' standard (M14) and the obligation to inform where to repair (M12), respectively, can be expected to have lower impact on consumer behaviour towards repair.

In addition to the results of the behavioural experiments, the consumer decision-making process was quantified in our study based on the production avoided (by not buying new products). Measures prioritising repair as a remedy under the legal guarantee result in a significant scale of production avoided (units) - 170 million units for M1 and M2, as defective goods are repaired instead of replaced with new ones. As most defects occur within the first year of the legal guarantee and remedies under the legal guarantee are free for consumers, the number of defects and respectively consumer goods concerned is significant in this scenario. Not surprisingly, measures that offer coverage outside the legal guarantee are expected to lead to high production avoided (in units), because the majority of defects consumers experience overall fall outside the scope or duration of the legal guarantee. For instance, M9b (Right to Repair for all products) is expected to lead to over 190 million products avoided while M11 (on issuing a quote) to over 160 million products (see Annex 3.3). As consumers need to pay for repair also under the measures beyond the legal guarantee, the scale of production avoided in the scenarios within and beyond the legal guarantee is comparable for some measures.

Most measures can be considered to potentially increase the trust in repair. This is especially the case for the interruption or suspension of the legal guarantee (M3), the extension of legal guarantee (M4) and the 'Right to Repair' (M9). They directly establish additional consumer protection in the context of the repaired goods. Expert interviews also suggest that this effect can be expected from the measure that proposes repair as primary remedy (M1) and the preference for repair under proportionality test (M2), as they increase the use of repaired products in society and thus contribute to an increased familiarity of consumers with repaired products. Furthermore, these measures would boost the repair market and make repair more accessible also beyond product defects that occur in a situation in which the legal guarantee is applicable. Moreover, some measures, such as issuing a repair quote (M11), the obligation to inform where to repair (M12), the platform with information on available repair services (M13) and voluntary commitments to an EU common 'easy repair standard' (M14) might improve consumers' trust in repairs and repaired products as these measures aim to empower consumers outside the legal guarantee by providing them information on where to repair, on the conditions and the quality of repair.

Lastly, some measures can have a direct impact on consumer savings which can be understood as individual benefits derived from the consumption of goods and services. This

is measured through consumer surplus (i.e. the difference between consumers' willingness to pay and what they actually have to pay). In this study consumer savings effects are characterised by the change in consumers' financial position. This value is zero for Measures 1 and 2, as repair as a remedy over replacement free-of-charge does not directly change the financial situation of the consumer, as long as the repaired product is equivalent with a replacement product (note that for most product categories, an overwhelming share of defects is discovered – and repaired – shortly after purchase). Although not receiving a new replacement product, but only repair can be considered to generate consumers detriment as they limit consumer choice of remedies, this assessment does not quantify this. It is assumed that the repair, as required, will be equivalent in quality to replacement (note that according to the consumer survey, most repairs occur relatively early in the lifetime of a consumer good). Measures 3, 4, 9a and 9b, 11, 12, 13 and 14 are considered to generate additional consumer surplus welfare, based on consumer savings as a result of repair instead of purchasing new replacement goods (see Annex 3.3).

For Measures 3 and 4 the consumer savings result from a longer legal guarantee period. For Measures 9a and 9b, 11, 12, 13 and 14 the consumers save as a result of additionally repaired products and thus using their own repaired products longer or alternatively, buying refurbished goods. The repair rates beyond the legal guarantee would depend on consumers' willingness to repair their products and not invest their money into new products. In the model's calculations, the savings under measures encouraging repair beyond the legal guarantee range between EUR 1.9 billion to EUR 79.9 billion depending on the measure (see Annex 3.3).

Measures 3 and 4 lead to more certainty regarding consumer surplus welfare benefits (consumer savings) as this does not depend on consumers' willingness to pay for repair and they would benefit from the longer legal guarantee periods in which the cost of the remedy would be covered by the seller. The savings for consumers under these measures have been estimated to amount to EUR 5.4 billion and 400 million, respectively. Based on the assumed take-up of repair under the measures beyond the legal guarantee, it is expected that measures 9a, 9b, 11, 12, 13a, 13b and 14 will contribute to consumer welfare (net savings of EUR 39.2 billion, EUR 79.0 billion, EUR 70.5 billion, EUR 10.5 billion, EUR 35.2 billion, EUR 1.9 billion, EUR 21.7 billion and EUR 21.0 billion, respectively).

Impacts on businesses

The economic impacts on EU manufacturers, sellers and repairers come either from changes in operational costs (savings or additional costs) or from a change in the volume of new or refurbished products as well as spare parts sold (an increase or a decrease). The change in sales and turnover are linked to corresponding changes in the GVA and gross operating profit generated.

The data collected in the stakeholder consultation suggests that the measures proposed under this problem are expected to somewhat extend the lifetime of goods via repairing rather than prematurely discarding and replacing them. This is chiefly achieved through making repair more often used as a the remedy for defective products – as for M1 (repair a primary remedy) and M2 (preference for repair under a proportionality test), or by improving the convenience and availability of repair for consumers outside the legal guarantee period, as for Measures 9a and 9b (right to repair), M11 (issuing a repair quote), M12 (information on where to repair), Measures 13a and 13b (platforms with information on available repair

services), and M14 ('Easy repair standard'). The impact is also achieved indirectly through the extended legal guarantee period, which may lead to manufacturing and selling more durable products to avoid defects within the longer legal guarantee period (M3 interruption or suspension of legal guarantee or M4 extension of legal guarantee). Longer average product lifetimes in turn lead to a decrease in the volume of new goods manufactured, as fewer of them would be needed to replace defective products, whether either as a remedy within the legal guarantee period or as new purchases by consumers. The latter constitutes a negative effect on manufacturers and sellers, as business profits cannot be generated on new products that are not sold to consumers.

On the other hand, the measures will also lead to an increase of repair activities and a higher production of spare parts and material needed for repairs, therefore generating profits for some manufacturers (at least partly offsetting the loss in revenue from the sales of new products) and repairers (for whom the effect is entirely positive). This positive effect will be the most pronounced for Measure 9a/9b (right to repair), followed by Measures 1 and 2. For Measures 3 and 4, the level of induced repair activities is estimated to remain low.

It is to be noted that the manufacturers affected are, to a considerable part, companies outside the EU (about 63% of the total value of the six product groups analysed is manufactured outside the EU). The significance of European manufacturing depends on the product group: an overwhelming majority of producers of mobile phones and laptops are located in third countries, and a majority of clothing and shoes are also being produced outside the EU, while the majority of wooden furniture production, as well as final assembly for TVs and refrigerators, often takes place within in the EU.

Depending on the measure, businesses may either benefit or face economic burdens from the policy changes. Specifically, under Measures 1 (repair as a primary remedy) and 2 (preference for repair under proportionality test), manufacturers would be able to reduce their operating costs by not being obliged to make as many replacement products available in the legal guarantee period at no cost to the consumer as today. Under these two measures, EU manufacturers would benefit from considerable savings from avoiding the cost of producing uncompensated replacement products – this has been estimated to amount to about EUR 20.1 billion over 15 years for each of the measures.

Concerning the measures falling within the legal guarantee period, we can expect manufacturers to take advantage of the new regime emphasising the role of repair, by making their products more repairable. This may somewhat increase prices – although the economic model results suggest that the average price increase across the products of interest would be insignificant. While producers and sellers would benefit from fewer costly obligations (i.e. repair over replacement), this benefit would be partly mitigated by the costs for the remedy of repair which remain relevant under the legal guarantee (including additional repair rather than replacement). This is calculated to be around EUR 4.5 billion for M1 and M2. Additional costs for repair are relevant under M3 as more additional repair costs would occur when repair is offered as a remedy for defective products under an extended liability period (under M3): namely around EUR 770 million for M3. Net cost savings from promoting repair as a remedy under the legal guarantee thus amount to EUR 15.6 billion for M1 and M2 respectively, and EUR 2.6 billion for M3. Costs savings from avoided new replacement products would also follow from the implementation of M3, as consumers would be more willing to accept repair in place of replacement albeit at a lower level.

Also, as replacement with a new product will be somewhat diminished, producers (or sellers) will lose some business from refurbishing and selling returned goods, as they will have fewer repairable products available (the estimate value is EUR 10 billion for M1 and M2 respectively, and EUR 615 million for M3).

Measures promoting repair outside the legal guarantee will lead to additional use of repair services as consumers will be better informed about the costs of repair and will be more likely to opt for it. Correspondingly, they will also result in some losses in the sales of new products, impacting producers and sellers negatively. For M11 the loss in turnover for EU manufacturers will be worth EUR 1.7 billion between 2023 and 2037, and EUR 7.1 billion for EU sellers. For M9a, the loss in turnover due to losses in sales of new products is estimated to be EUR 1 billion for manufacturers and EUR 5.1 billion for sellers. The corresponding figures for M9b are EUR 2.0 billion and EUR 8.1 billion, respectively. For measures 12 and 14, the losses amount to EUR 300 and EUR 500 million for manufacturers and EUR 1.1 and EUR 2.1 billion for sellers. The expected loss in turnover for EU manufacturers under M13a is approximately EUR 900 million, and EUR 500 million under M13b. For traders, the corresponding losses in retail margin have been estimated to be EUR 1.0 billion and EUR 800 million, respectively.

Measures 3 (interruption/suspension of guarantee) and 4 (extension of guarantee) both lengthen the legal guarantee period, whether by a variable (M3) or a fixed amount of time (M4). Sellers and respectively producers via their B2B agreements with sellers – would hence be required to offer remedies for more defective products, which would increase their costs by about EUR 766 million for 15 years (M3). The model used in this study projects slightly increased average product lifetimes here again as repair will be available free of charge for consumers for a longer period.

With increased demand for repair, the repair service sector – including in-house repair of producers and sellers as well as various authorised or independent repair businesses – will benefit under all measures from increased sales, leading to a higher GVA and profit generation. This will be the highest under M9b, M11 and M1-2 (EUR 14.1 and EUR 12.4 billion respectively as well as EUR 12.8 billion for both of the latter two). To prepare for increased business, there will be a need for investment into capacities covering their infrastructure, equipment and human resources – or in establishing new partnerships with subcontracted repairers.

The measures, especially M9b, M11 and M1-2, followed by M9a and M13a, will result in job generation in the repair sector (with new jobs up to ~9,000, for M9b), which in the context of M9b, M11, M9a and M13a is outweighing estimated job losses at European manufacturers, importers and the distribution network (wholesale and retail, including the selling of refurbished second-hand goods). In the context of M1 and M2 the job losses of manufacturers and sellers outweigh the increase in repair jobs. It is important to note however that the calculated loss of jobs in manufacturing and repair does not account for indirect job creation resulting from savings for consumers in their purchasing power, which they can deploy in buying other goods or services.

SMEs as a whole would benefit under most of the measures. They have a relatively large share in the repair sector which will gain substantial new business with the policy changes envisaged. According to Eurostat data, businesses with fewer than 250 employees accounted for 99.7% of all enterprises in the repair sector, 77% of aggregate turnover, 80% of value added, and 89% of employment in 2019. SMEs account for over 60% of the total

turnover in the manufacture sectors of footwear, clothing, and furniture, although only for about 20% in the manufacturing sector of mobile phones, laptops, and TVs. The business revenues gained, the additional GVA generated, will outweigh the costs, although SME producers and SME retailers will be disproportionately negatively affected under most measures, where the loss of business will be aggravated by high adjustment and administrative costs relative to their turnover (note however that Measures 1 and 2 reduce costs for producers). The magnitude of these costs is however moderate, outweighed by the economic benefits to the SME sector as a whole.

Impacts on public administration (enforcement and implementation costs)

Some measures require changes to the SGD, with which enforcement authorities are already familiar, keeping familiarisation costs rather low. However, there are costs associated with the inspections that market surveillance authorities need to conduct among sellers of goods, which also constitutes the largest stakeholder group among all the groups affected by the measures considered under this impact assessment. Together with IT and communication costs as part of the measures' implementation, the total costs for public administration are estimated to be EUR 28.2 million for measures 1-4, EUR 32.0 million for M13a, and below these figures for the rest of the measures. Measures 9a, 9b, 11, 12 and 13 introduce higher familiarisation costs due to these instruments being new and not an amendment to any existing legislation. M9b would induce the same familiarisation costs but higher inspection costs as it would apply to producers of all products (EUR 229,559 for M9a and EUR 747,793 for M9b as annual average).

Also, awareness raising costs are assumed to be 50% higher for measures outside the legal guarantee as more efforts will need to be put into making consumers aware of the new instruments. M11 on issuing a repair quote applies to repairers as well as manufacturers / sellers carrying out repairs, which increases the enforcement costs.

Voluntary measures (M13a, M13b, and 14) induce no cost for inspections but solely some monitoring costs. M13-14 have the lowest enforcement costs due to their voluntary nature, but measures 13a and 13b have relatively high implementation costs linked to the development of the platform and its maintenance. The costs are lower if the platform is adopted at EU level (EUR 500,000 development cost) compared with national level (EUR 7,500,000), because the national level platform requires enforcement efforts from the authorities of all 27 MS.

Annex 3 – chapter 3 provides more details on how enforcement costs were calculated.

Environmental impacts

The environmental impact assessment aims to show how the proposed policy measures would improve repairs compared with the baseline situation. The baseline reflects the current repair situation in the EU and the potential savings already achieved through repairs. Therefore, the savings achieved by the measures correspond to the savings achieved by repairs **in addition** to those already achieved. As with the baseline scenario, the impact assessment has been calculated for a period over 15 years. This is a realistic time for the estimated impacts of the policy measures to materialise.

All measures related to problem 1 contribute to climate change mitigation (displayed in CO₂-equivalents emitted in atmosphere), resource savings (in Mio. tonnes) and waste savings (in Mio. tonnes). As most measures aim to promote repair and to increase the number of repairs, all measures contribute to a certain extent to an extension of the average consumption lifetime of products. The lifetime extensions can be translated into a reduced number of products which need to be produced and purchased. The reduced number of products purchased and thus produced leads to CO₂ savings during the raw material extraction, the manufacturing and the end-of-life phase. Furthermore, less production means a decrease in resource use and waste generation. As the model is based on products sold and imported to the EU (exports are subtracted), the environmental savings relate to products used in the EU. Hence, if consumers in the EU decide to repair more and to buy fewer new products, producers in any country might be affected. The environmental savings must also be seen on a global scale, as the raw material extraction, the manufacturing and the final use likely take place in different countries.

The calculation model which was applied for the quantification of environmental impacts covered a selection of relevant consumer products and thus provides an indication of the extent of the environmental impacts associated with premature disposal of products (see Annex 3 – chapter 2 for further explanations on the model). However, since this selection only covers a part of all consumed products, the actual environmental impacts may be greater, depending on the chosen scope of the various measures, if they are implemented. For example, measures 9a and 13b, which only cover Ecodesign products, show lower environmental savings than measures 9b and 13a, which are designed to cover all products. To calculate with an adapted scope of the measures, M9a and M13a covering Ecodesign products, clothing, shoes, cars and wooden furniture were removed from the selection of products.

To estimate how the environmental impacts would affect the economy as a whole, all environmental effects were multiplied by an extrapolation factor of 5.7 (see Annex 3 – chapter 4). The following estimates are based on the extrapolated data:

M9b shows the greatest CO₂ savings. Since the measure is designed to cover products outside legal guarantee, a broader base of products can be reached by these measures and therefore the potential increase in repairs (and the related environmental savings) is higher. While M12, M13a, M13b and M14 cover products outside legal guarantee as well, they show a lower take up rate and thus the environmental savings are in the middle range. M11 (covering products outside legal guarantee as well) rank directly after M9b, M1 and M2.

M1 and M2 are designed to cover defects within legal guarantee but have a high expected take up rate since the measures will include a legal obligation. In consequence, they come in second place. M1 and M2 have the same environmental savings since they are based on the same underlying assumptions. Although M1 and M2 are expected to have a high repair uptake it will not be 100% as replacement is still an option. Due to lack of data, the same replacement factor was used for M1 and M2 although M2 would potentially avoid more replacement.

M4 has by far the lowest environmental impacts. This is due to the fact that M4 only covers defects in the third year of an extended legal guarantee. Hence, the basis of products/defects to which the measure applies is limited. M3, which refers to defects within the legal guarantee, is lower than most measures referring to defects outside the legal guarantee, but higher than M4, as it covers not only products that have a defect during an

additional year of the legal guarantee, but also defects that occur during the two years of the legal guarantee.

Coherence and applicability of the EU legal framework

Considerations concerning trade-offs in environmental impacts

When calculating the impacts per measure the use phase was not considered, as repair is assumed to reduce the number of products which need to be purchased as new (i.e. affects raw material, production and end-of-life phase) and does not affect the use phase as such. A decision for repair might influence the energy efficiency/use during the use phase, since newer products may be more energy efficient. However, such trade-offs between repair and a more energy efficient new product were not considered in the calculations. Nevertheless, it should be noted that energy efficiency improvements have slowed down in recent years (Glöser-Chahoud et al., 2021). Data also suggests that the energy efficiency gains will reach a limit at some point due to physical limits (Glöser-Chahoud et al., 2021). Furthermore, the environmental impacts of repair itself were not considered. In reality, however, a costly repair process could reduce or negate the potential environmental savings of lifetime extension. The aforementioned trade-offs should be kept in mind when considering the findings of environmental impacts in this section.

Finally, it should be noted that with regard to the whole lifecycle of products, repair can

Most of the measures under consideration are coherent with the existing EU legal framework and their implementation would require the revision of different articles of the SGD. The measures with applicability outside the legal guarantee or provisions of the SGD would require either a new legal instrument (M9) or the amendment of other legislative instruments (M11). M9 would provide additional protection to consumers in an area where they are currently protected only if they acquire commercial guarantees, while Measures 11, 12, 13 and 14 would complement the ECGT by ensuring that consumers receive all the necessary information when their product breaks outside the legal guarantee and that could help them make an informed decision on whether they should repair or not.

The other measures considered under the legal guarantee are all coherent with the existing legal framework (in particular the SGD) and their implementation would require an amendment of this Directive. There are measures that although would have a positive environmental impact, would limit consumer rights to a certain extent. This is the case of Measures 1 and 2 where consumers would need to accept the remedy if replacement is more costly. The current version of the SGD promotes a consumers' choice of the type of specific performance and M1 takes this choice away from consumers. As for M2, this would increase legal uncertainty of consumers as to which remedy they will be able to benefit from when they identify a defect.

5.3.2.2. Problem 2: Limited use of second-hand goods by consumers

This section assesses the impacts of the measures aiming at addressing the issue of limited use of second-hand goods by consumers. More information about the results of the

experiment or consumer survey can be found in Annex 1, while Annex 3 provides more information on the methodology deployed to calculate impacts of the measures.

Impacts on consumers

The three measures that relate to problem 2 can be expected to have several impacts on the situation of consumers. When it comes to consumer choices, aligning the legal guarantee periods (M7) is likely to effectively expand consumer rights. Consumers will have a longer guarantee period under which they can claim a remedy from the seller or manufacturer if the used product that they purchased turned out to be defective. On the other hand, it can be considered that replacing defective products with refurbished goods (measures M8a and M8b) will likely curtail consumer choices and thus would have a negative impact in terms of consumer rights.

The evidence collected for this study suggests that all three measures can be expected to have a behavioural impact on consumers that increases the uptake of second-hand or refurbished products. The behavioural experiment has shown that the consumers place a high value on an extended guarantee period. Therefore, aligning the guarantee period for used refurbished products with those for new goods (M7), will likely lead to an increased uptake of used refurbished products in the market. In particular, the experiment revealed that consumers put a high price premium on a used product that comes with a guarantee period that is valid for 2 years instead of 1 year. With regard to highly refurbished products, this premium ranged from 33% for smartphones to 20% for shoes, among the tested product types, in regard to highly refurbished goods. This indicates that an extended guarantee period for used products could indeed have a considerable impact on the perception of consumers of used products and their uptake in the marketplace. The behavioural impact of using refurbished goods as replacement (measures M8a and M8b), on the other hand, is less clear and can likely be expected as an indirect effect stemming from a possible higher acceptance of refurbished goods by consumers. Opinions expressed in the expert interviews support the assumption that a longer guarantee period for used products could improve the negative perception that consumers currently have of these products.

It can be expected that aligning the legal guarantee period for refurbished second-hand goods with new goods (M7) will have a strong impact and effectively increase consumer trust in refurbished products, as it provides additional protection to consumers, which is a major concern for buyers in the market of used goods. The measure that considers a replacement with refurbished goods in the extended liability period (M8a) can be considered likely to have some positive impact on consumer trust, because, although it provides less choice to consumers regarding the remedy for possible defects compared with the scope of the existent legal guarantee, the extension of the guarantee period means increased consumer protection. This element is missing from the measure that proposes a replacement with refurbished goods from the second year of the liability period (M8b), which would limit the remedies within the existent legal guarantee. In the latter case, no additional protection for consumers is provided.

The economic model yielded an estimated EUR 1.5 billion improvement in the financial position of consumers coming from M7, and about EUR 822 million for M8a (zero for M8b) for a period of 15 years (see estimates on consumer changes in purchases for respective options in Annex 3.3).

While aligning the legal guarantee period for refurbished second-hand goods with new goods (M7) generates significant savings for consumers and thus increase consumer welfare (EUR 1.5 billion), such increase in consumer welfare cannot be expected from the two measures that propose the replacement of defective products with refurbished goods (measures M8a and M8b). Under M8a the consumer gains are approximately half of those for M7 and in the case of M8b the limitation of the choices of consumers results in 0 gains in consumer welfare.

Impacts on businesses

The three measures assessed in this cluster appear to be effective – providing for a slightly longer average product lifetime, more repair and refurbishment and less manufacturing of new goods — through different mechanisms. M7 would make refurbished goods more attractive to consumers as the duration of the liability period would in effect increase – with restricting the possibility for agreeing on liability periods shorter than 2 years (but at least 1 year) between the seller and the consumer. Consumers would thus gain access to refurbished goods which are sold under very similar terms as new products but at discounted prices. The quality of the goods would be almost equivalent to new products, save for possible optical degradation. This measure is estimated to bring some operational savings from avoiding replacement product, as only repair would be provided (EUR 40 million). However, increased repair costs will be higher than that, amounting to about EUR 800 million, due to the longer liability period in which refurbished goods would have to be repaired for free by the seller.

Measures 8a and 8b would provide an important incentive to sellers to repair and/or refurbish used products as they will be able to save on the cost of the remedy in the case of defective products. Refurbishing a used product and offering it as replacement may in many cases be cheaper than supplying a new one when replacement is requested by the consumer as a remedy or only replacement is feasible. The goods to be refurbished might have been returned by the buyer in used condition without defects (e.g. during the cooling down period of an online purchase), or defective but subsequently repaired and refurbished by the seller.

The reduced demand for new products would have different impacts on producers: under M7 it would lead to loss of business in the sectors concerned worth EUR 400 million, as a number of consumers would be content with purchasing refurbished goods (this approach does not account for the positive economic knock-on effects coming from the consumer spending power retained) – but it would also yield an increase in the sales of refurbished goods worth 600 million euro. M8a will introduce an extended liability period, hence additional cost. M8b, on the other hand, will result primarily in cost savings for producers (it needs to be noted that many of them are located in third countries) in the magnitude of about EUR 2.5 billion. Both measures involve an increased demand for repair and refurbishment that will benefit – mostly – European businesses active in repair, whether in-house or authorised repair workshops. M7 will have far greater impacts on revenues of producers, sellers, and repairers than Measures 8a or 8b

Lastly, two measures addressing the issue of limited use of second-hand goods would translate into cost savings for consumers as consumers would invest more in refurbished goods (cheaper) than new ones. Under M7 consumers would save because they would gain an additional year of free remedies in the extended liability period for refurbished goods.

This measure will produce these impacts only in the Member States where consumers do not already benefit from a 2-year liability period for refurbished goods. Under M8a consumers would save in the additional year of an extended liability period in which they would receive refurbished goods as a free remedy instead of paying for repair themselves. On the other hand, M8b imposes the remedy of replacement with refurbished goods within the existing liability period to consumers, which translates into reduced consumer protection and no cost savings could be identified. The extent to which this measure would be detrimental to consumers depends on sellers' interpretation of refurbished goods (currently, no clear definition exists).

Impacts on public administration (enforcement costs)

Some measures require changes to the SGD, which enforcement authorities are already familiar with. This would keep familiarisation costs rather low. However, there are costs associated with the inspections that market surveillance authorities need to conduct among sellers of goods, which constitutes also the largest stakeholder group among all the groups affected by the measures considered under this impact assessment.

M7 induces rather limited enforcement costs as inspections would be carried out only among sellers of refurbished goods. Of the total number of businesses concerned by the measures considered by this study, M7 impacts only a small share (approx. 1%).

Overall, measures 7 and 8 (a and b) would generate the same one-off enforcement costs per measure (EUR 512,528, e.g. for one-off familiarisation costs with new rules). Even though M8 concerns more economic operators, costs are the same as it is assumed that these measures are applicable under the existing legal framework with which market surveillance authorities are already familiar (and inspections are already carried out under the current status quo). As regards ongoing costs for a period of 15 years, these are estimated to be lower for M7 (EUR 242,922), as it concerns a much smaller number of economic operators (sellers of refurbished goods), but higher for M8 a and b (EUR 27,693,138 per measure), as they concern all sellers.

More information about assumptions made for the enforcement costs can be found in Annex 3.3.

Environmental impacts

All measures related to problem 2 contribute to climate change mitigation (displayed in CO₂-equivalents), resource and waste savings. As the measures aim to promote the purchase of second-hand and refurbished goods, each of the measures contributes to a certain extent to an extension of the average consumption lifetime of a product. In contrast to the measures promoting repair, the measures under problem 2 might not contribute to an extension of the average consumption lifetime of the original (defective) product but to an extension of the average consumption lifetime of the refurbished product (assumed to be formerly used by another actor, not by the concerned consumer). However, in both cases, a product will experience a longer consumption life. Therefore, we applied the same calculation methods to all measures (under problem 1 and 2). As indicated under problem 1, the model is based on products sold and imported to the EU (exports are subtracted) and current repair rates. The environmental savings achieved by the measures correspond to the savings achieved

by repairs **in addition** to those already achieved (see baseline). The potential impacts have been calculated for a period over 15 years. If consumers in the EU decide to repair more and to buy fewer new products, producers in any country might be affected and environmental savings can be achieved on a global scale. The calculation model which was applied for the quantification of environmental impacts covered a selection of relevant consumer products and thus provides an indication of the extent of the environmental impacts associated with premature disposal of products. To estimate the impacts on the economy as a whole, all results were multiplied with an extrapolation factor of 5.7.

It should be noted that the presented measures are presented in a cross-product view. However, in current practice refurbishment is not common practice for all the selected products (e.g. not for shoes). Therefore, M7, M8a and M8b might be less successful for certain product groups and may thus lead to smaller environmental savings.

As described under problem 1, lifetime extensions can be translated into a reduced number of products that need to be purchased, which will then, through decreasing production, result in CO₂ savings during the raw material extraction, the manufacturing, and the end-of-life phase. The measures under problem 2 also lead to a decrease in resource use and waste generation. The results of the environmental impact assessment show that M7 has greater potential CO₂, waste, and resource savings than M8a and M8b. M7, M8a and M8b cover all products (not only ESPR products) but differ in expected take-up rate and the number of defective products concerned. As M8a would only apply in the additional liability period going beyond the minimum liability period of two years, only defects in the 3rd year would be covered and the number of such defects is minimal. M8b would allow sellers to offer refurbished goods as a replacement from the second year of the liability period, meaning that a higher number of defective products than that covered under M8a are affected, because more defects manifest themselves in the second year after delivery, compared with the third year after delivery. Since more defects occur in the second year than in the third year of a legal guarantee, the potential environmental savings of M8b are higher than for M8a.

Coherence and applicability of the EU legal framework

All measures considered under this problem are coherent with the existing EU legal framework and could be implemented through an amendment of the SGD. The measures require a legally binding definition of refurbished goods to ensure legal certainty before implementation, as currently consumers rely on the seller's description of the refurbished goods. ESPR provides a relevant definition of 'refurbishment' in Art 2(18).

5.3.2.3. How do measures compare?

The table below summarises the results on the environmental, business, consumer and other relevant impacts of each measure considered based on the MCA (see Annex 3.3).

Table 36 - Overview of measures' significant impacts based on an MCA analysis (Part 1): Measures within the legal guarantee (concerning new refurbished goods)

High-level criteria	Stakeholders affected	Sub-criteria / impacts	Unit	M1	M2	M3	M4	M7	M8a	M8b
Coherence		Coherence with other EU legislation	Qual score	5	5	5	5	5	4	4
Effectiveness	Consumers	Consumer decision-making process	Units	0	0	28,698,162	5,146,385	30,879,222	10,415,303	0
1 Effectiveness	Consumers	Consumer trust and protection	Qual score	-3	-1	1	2	1	1	-1
Effectiveness	Society	Fostering the efficient use of resources (renewable & non-renewable)	EUR	661,597	661,597	111,371	15,785	119,835	31,946	71,879
Effectiveness	Society	Waste production, generation, and recycling (waste savings)	EUR	1,046,344	1,046,344	176,138	26,772	189,524	54,182	121,910
Effectiveness	Society	Contribute to fighting climate change (CO2 emissions savings)	EUR	5,322,067	5,322,067	895,899	143,272	963,987	289,955	652,400
Efficiency	Businesses	Business adjustment costs	EUR	845,685,161	862,305,702	2,130,365,143	1,017,417,602	228,478,919	228,552,060	325,950,774
Efficiency	Businesses	Business administrative costs	EUR	0	0	0	0	0	0	0
Efficiency	Public administration	Implementation and enforcement costs	EUR	28,205,666	28,205,666	28,205,666	28,205,666	755,450	28,205,666	28,205,666
Efficiency	Businesses	Savings in production costs for manufacturers	EUR	15,558,115,736	15,558,115,736	2,606,621,739	0	-776,480,296	0	1,994,019,308
Efficiency	Consumers	Consumer savings	EUR	0	0	5,388,976,229	406,284,140	1,518,275,814	822,241,712	0
Efficiency	Society	Change in employment	jobs	-1,287	-1,287	24	112	1,004	226	1,040

Efficiency	Businesses	Growth and investment (in Europe - GVA traders, producers, repairers)	EUR	-827,938,061	- 827,938,061	12,726,876	68,672,140	596,320,073	138,980,913	623,861,785
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Table 37 - Overview of measures' significant impacts based on an MCA analysis (Part 2): Measures beyond the legal guarantee (concerning new and refurbished goods)

High-level criteria	Stakeholders affected	Sub-criteria / impacts	Unit	M9a	M9b	M11	M12	13a	13a+	M13b	M14	Combined (M2, M9a, M11, M12, M13a, M13a+, M14)
Coherence		Coherence with other EU legislation	Qual score	5	-3	5	4	3	3	2	3	5
Effectiveness	Consumers	Consumer decision-making process	Units	108,94 3,135	1,745,9 31,635	1,539,1 76,573	229,72 7,847	769,58 8,286	72,364 ,272	60,323, 885	459,45 5,693	4,594,760,145
1 Effectiveness	Consumers	Consumer trust and protection	Qual score	3	4	3	1	2	1	1	1	1
Effectiveness	Society	Fostering the efficient use of resources (renewable & non-renewable) (resource savings in tonnes)	EUR	161,85 9	579,91 9	511,24 4	76,305	255,62 2	24,036	89,625	152,61 0	1,843,274
Effectiveness	Society	Waste production, generation, and recycling (waste savings)	EUR	182,35 3	1,022,9 27	901,79 1	134,59 6	450,89 5	42,398	100,97 2	269,19 1	3,027,567
Effectiveness	Society	Contribute to fighting climate change (CO2 emissions savings)	EUR	3,165,0 41	5,666,9 47	4,995,8 61	745,65 1	2,497,9 30	234,88 0	1,752,5 43	1,491,3 02	18,452,732
Efficiency	Businesses	Business adjustment costs	EUR	627,11 5,575	3,936,2 79,758	6,368,2 14,524	266,55 8,429	0	0	0	0	8,124,194,230
Efficiency	Businesses	Business administrative costs	EUR	69,818, 210	161,79 0,438	0	0	0	0	0	0	69,818,210
Efficiency	Public administration	Implementation and enforcement costs	EUR	4,493,4 90	12,267, 003	26,422, 083	12,267, 003	31,953, 783	3,828, 783	4,501,8 56	2,501,8 56	105,518,993

High-level criteria	Stakeholders affected	Sub-criteria / impacts	Unit	M9a	M9b	M11	M12	13a	13a+	M13b	M14	Combined (M2, M9a, M11, M12, M13a, M13a+, M14)
Efficiency	Businesses	Savings in production costs for manufacturers	EUR	0	0	0	0	0	0	0	0	15,558,115,736
Efficiency	Consumers	Consumer savings	EUR	39,244,090,565	79,937,037,233	70,468,940,877	10,515,988,406	35,230,996,001	1,948,511,557	21,728,197,134	21,032,595,233	176,492,611,081
Efficiency	Society	Change in employment	jobs	1,928	4,795	4,227	631	2,113	199	1,067	1,261	8,872
Efficiency	Businesses	Growth and investment (in Europe - GVA traders, producers, repairers)	EUR	782,780,507	2,842,329,778	2,505,606,802	373,847,191	1,252,559,221	117,757,177	433,315,530	747,737,848	4,834,593,508

5.3.3. Combined package of measures

The study analysed the combined impacts of a package of options agreed with the Commission services.

The table below summarises the results of the MCA as regards performance of measures in terms of effectiveness, efficiency and coherence, and an explanation of results can be found in Annex 3.3.

Table 38 - Summary results of the MCA

	M1	M2	M3	M4	M7	M8a	M8b	M9a	M9b	M11	M12	M13a	M13a +	M13b	M14	Combined (M2, M9a, M11, M12, M13a, M13a+, M14)
Effectiveness	1.59	1.71	0.36	0.16	0.38	0.15	0.15	0.77	2.16	1.88	0.31	0.97	0.14	0.39	0.57	6.01
Efficiency	-0.26	-0.26	-0.39	-0.38	0.09	-0.31	-0.19	0.08	0.09	0.06	-0.05	0.00	-0.01	0.13	0.19	0.02
Coherence	0.50	0.50	0.50	0.50	0.50	0.40	0.40	0.50	-0.30	0.50	0.40	0.30	0.30	0.20	0.30	0.50
TOTAL	1.84	1.95	0.47	0.28	0.97	0.23	0.36	1.35	1.96	2.44	0.66	1.26	0.42	0.72	1.06	6.53

The table below illustrates the impacts of the combined package of measures (M2, M9a, M11, M12, M13a, M13+ and M14). If implemented together, these measures may induce fewer costs than estimated if these measures were to be implemented individually. However, as measures target different types of stakeholders, overlaps are rather minimal.

Table 39 - Impacts of combined package of options

High-level criteria	Sub-criteria / impacts	Combined (M2, M9a, M11, M12, M13a, M13a+, M14)
Coherence	Coherence with other EU legislation	5
Effectiveness	Consumer decision-making process	4,594,760,145 (units)
Effectiveness	Consumer trust and protection	1
Effectiveness	Fostering the efficient use of resources (renewable & non-renewable) (resource savings in tonnes)	1,843,274 tonnes
Effectiveness	Waste production, generation, and recycling (waste savings)	EUR 3,027,567
Effectiveness	Contribute to fighting climate change (CO2 emissions savings)	EUR 18,452,732
Efficiency	Business adjustment costs	EUR 8,124,194,230
Efficiency	Business administrative costs	EUR 69,818,210

High-level criteria	Sub-criteria / impacts	Combined (M2, M9a, M11, M12, M13a, M13a+, M14)
Efficiency	Implementation and enforcement costs	EUR 105,518,993
Efficiency	Savings in production costs for manufacturers	EUR 15,558,115,736
Efficiency	Consumer savings	EUR 176,492,611,081
Efficiency	Change in employment	8,872 jobs
Efficiency	Growth and investment (in Europe - GVA sellers (traders), producers, repairers)	EUR 4,834,593,508

1. Impacts on businesses

Consumer savings: The model used for the assessment of economic impacts looked at the change in the net financial position of consumers, taking into account consumer savings.

An extension of product lifetimes and better information on repair as well as access to, and attractiveness of, repair services will help consumers postpone purchases of new products, thus making them save money. The possibly of a (slightly) smaller utility derived from repaired or refurbished products as opposed to a new consumer durable goods, was not considered in this approach, although this effect may be noteworthy especially for fast-evolving electronics where a new product may offer significantly more functionality and other consumer value (e.g. a more appealing and trendier design, ease of use).

The model estimates a gain in the net financial position of consumers of EUR 176,5 billion over 15 years. This is composed of savings worth EUR 207.6 billion associated with not having to purchase replacement products, and additional expenditure worth EUR 31.1 billion on repair services (outside the legal guarantee).

Growth and investment (in Europe): The model for the assessment was built upon a value chain approach, the stakeholder consultations, Eurostat data and complementing assumptions. It has estimated production cost savings on one hand, and revenue and GVA gains or losses from selling new or refurbished goods on the other hand. This calculation was conducted separately for manufacturers, sellers (including importers who would be defined as 'producers' under the SGD) and repair services.

In this package of measures, the introduction of a preference for repair in the proportionality test (M2) will result in cost savings for manufacturers or sellers (depending on the party practically bearing the costs of remedies for replacement of defective goods under sales contracts). The model calculates with a reduction of production worth EUR 57.2 billion globally, which corresponds to goods that producers would have otherwise needed to manufacture and offer as replacement to consumers for free. Out of this amount, production costs savings for EU manufacturers would amount to EUR 20.0 billion (the share of EU producers varies significantly across product categories). However, European producers would also need to fund repair activities including the production or procurement of additional spare parts worth EUR 4.5 billion, resulting in a net cost reduction of EUR 15.6 billion. Manufacturers would also lose some revenue from the re-sale of previously returned and repaired/refurbished products (est. EUR 10.0 billion), as these would not be available anymore at the same volume if more defective goods will be repaired instead of replaced.

The shift towards repairing products (aided indirectly by several of the measures) will also result in fewer new products being sold. This loss in revenue from the selling of new products is estimated to be around EUR 4.3 billion for EU manufacturers, corresponding to a loss in GVA of EUR 1.0 billion.

Changes in sellers' margins and derived economic indicators would come from not being able to sell as many new or resale of defective products for refurbishment as without the implementation of the combined measure. The change in turnover (due to loss of sales) in the European distribution sector (importers, wholesale, and retail of new as well as refurbished products included) would amount to an estimated EUR 40.4 billion over 15 years. Using average Eurostat figures on the economic structure of the sector, we can calculate with a loss in GVA among sellers amounting to EUR 10.9 billion.

Repair activities (whether in-house or outsourced) would increase as a result of increased demand for them (whether financed by producers or consumers, when outside the legal guarantee). The model used for the assessment estimated that repair sector revenues will be expanding by EUR 44 billion, partly paid by third-country producers. According to the business survey and market research, a portion of repair is normally conducted in third countries, but this is a rather small fraction which we can disregard in our model and consider all of the increased repair activities to take place in the EU. This translates into an additional EUR 16.7 billion in GVA produced in the sector.

Facilitating SMEs growth: This criterion has been assessed qualitatively only, taking into account, on the one hand, the business structure (by size) in the production of the seven product groups selected for the product sample and the related repair services, as well as in retail; and, on the other hand, the general finding that adjustment and administrative costs are usually much more burdensome – in relative terms – for SMEs (especially for the smallest enterprises) than for large enterprises. SMEs may not always have available in-house capabilities and free capacities to deal with complex adjustments of their operations, terms and conditions, forms and processes and IT systems and need to procure these from external sources. Furthermore, the costs introduced by new legislation relative to the size of their (relevant) operations is usually much higher than what large enterprises face, as these costs often do not scale proportionately to turnover or GVA produced.

Overall, however, the impacts of the measures on SMEs are likely to be positive. The increased turnover and GVA generated in repair, which is the outcome of all the individual measures in the preferred option and the combined measure itself, will disproportionately benefit SMEs, which have a relatively large share in this sector in terms of company turnover. On the other hand, many of the measures bring costs for manufacturers and sellers, who may lose revenues from selling new products, selling refurbished goods, or being obliged to offer additional remedies. However, the share of SMEs in production and retail is lower than in repair. SMEs account for over 60% of the total turnover in the manufacture of footwear, clothing, and furniture sectors, but below 20% in the sectors manufacturing mobile phones, laptops and TVs. The weight of SMEs is also relatively low in retail with regard to the product groups covered.

In effect, although adjustment and administrative costs relative to business revenues are disproportionately higher for SMEs, the overall balance of costs and benefits under the preferred option is expected to be slightly beneficial for SMEs as a whole. This however masks a significant difference between SMEs in repair, which will clearly benefit, and SMEs in manufacturing and retail, which will be somewhat disadvantaged, also vis-à-vis their larger competitors.

Functioning of the internal market and competition: This criterion has also been assessed in a qualitative manner. The combined measures would contribute to the harmonisation of rules in the internal market and fair competition with regard to remedies offered in the case

of defective products within and beyond the legal guarantee period. Some of the measures in the combined package (e.g. M9a, M11, M12) would also pre-empt future divergence in national laws applicable to repair activities in particular on aspects beyond the legal guarantee which are unregulated in EU law.

Business adjustment costs: The combined measure will impose certain one-off compliance costs upon businesses (manufacturers, sellers and repairers) relating to the need for companies to familiarise themselves with the new rules, updating terms and conditions, product documents (e.g. information on available repair), company procedures and forms (e.g. for quotes), as well as management planning, negotiating and agreeing with (authorised) repair shops, setting out terms and conditions for repairs outside the current SGD remedies system, supplying repair shops with the necessary information and tools. The total one-off adjustment costs are estimated to reach EUR 731 million.

Recurring costs of about EUR 8.0 billion for the 15-year time period are also expected: a large part of this concerns M11 relating to the ongoing costs for the provision of quotes (which are assumed to be fully borne by the repairer for the purpose of the estimate).

Business administrative costs: Most measures combined in this combined policy measures do not impose significant administrative burdens upon businesses. The measures are typically not associated with information obligations, in total we calculate with a minor one-off administrative cost of about EUR 69 million, mainly linked to the introduction of right-to-repair (of Ecodesign products), which is likely to involve some mandatory obligations for producers to keep records and produce reports in relation to the compliance of their products with the new legislation. Participation of repair companies in the proposed EU platform (M13a) may also involve necessary administrative tasks: these would concern documentation requirements such as proof that they are authorised to carry out the relevant repair services etc. As participation is voluntary, however, meeting these information obligations of the platform would not fall under the scope of administrative burdens in the sense of the BRG's (and would be expected to be relatively minor in any case, as the documents that might be asked for would need to be basic and not difficult for repair services to furnish).

Change in employment: The implementation of the combined measures package will have a small effect on employment, according to our model. Notably, the latter estimates that employment among EU manufacturers of consumer durables affected will decrease by 1,828 jobs as a direct impact of the combined measure, and among European sellers by 18,301. On the other hand, European repair service providers (which may include in-house repair services of producers or sellers) are projected to create 29,002 jobs as a result of the demand induced by the measures. Overall, this results in a net benefit in employment estimated to be 8,872 jobs, due to an increase jobs in the repair sector. This calculation does not take into account any indirect job generation in various manufacturing, retail and consumer service sectors, as European consumers will be retaining more of their spending power. If average product lifetimes expand, they will be spending these savings to a large extent on the purchase other goods and services.

2. Impacts on consumers

Consumer decision-making process: M2 has no direct impact on consumers' decision-making process as consumers cannot opt for replacement and choose a remedy while M12 has only a limited impact on the decision-making process as it only informs consumers on

repair possibilities. However, the remaining measures, outside the legal guarantee, empower consumers and shall improve the consumer decision-making process. The combined impact of the combined measures is overall positive, mostly due to benefits to the consumer decision-making process created by measures 9a, 11, 13a and 14.

Consumer trust and protection: M2 might have a negative impact on consumer trust as it removes consumers' right to choose the remedy under the legal guarantee in the case where the proportionality test shows that repair is cheaper than replacement, even if consumers actually prefer to have their product replaced. However, the remaining measures, outside the legal guarantee, empower consumers and shall improve the consumer trust and protection as currently they benefit from limited protection and information. The combined impact of the combined measures is overall positive, mostly due to M9a's benefits from improving consumers' trust and protection by means of a new right.

It is calculated that the financial position of consumers will improve 176.5 billion between 2023 and 2037. The estimate factors in smaller spending on new replacement goods, savings from purchasing refurbished goods instead of new ones (due to their lower price), while considering the increased spending on repair services by consumers for options where they bear the costs of repair.

3. Impacts on the environment

There are no overlaps between environmental impacts generated by the combined measures, hence impacts are added up. To better understand the environmental impacts of the combined measures, a comparison with environmental impacts of complementary initiatives was necessary. The ECGT initiative indicates that if all combined options are combined, the total of saved CO₂ over a period of 15 years might amount to 5-7 Mt CO₂ equivalents.¹³⁰ For the combined option of the present initiative (M2, M9a, M11, M12, M13, M13a and M14), CO₂ savings over a 15-year period of 18.5 Mt CO₂ equivalents are expected. These numbers are approximately triple the savings from the ECGT initiative. Moreover, the combined measures (apart from M2) come to complement the ECGT, as they aim to extend the rights of consumers outside the legal guarantee and they improve the provision of information post-purchase. Therefore, the savings achieved under the present initiative can be considered as an additional effect on the savings accumulated by the ECGT initiative.

The preferred options under the ESPR initiative, the Ecodesign scope will be extended to cover 65% of total GHG emission from products consumption in the EU, 64% of particulate matter emissions and 70% of resource depletion. Assuming an improvement of 15% of environmental impacts over the entire scope from ESPR measures (looking at GHG emissions only), this would lead to globally reducing GHG emissions by around 471 Mt CO₂

¹³⁰ COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT Accompanying the document.

equivalents, which is the equivalent of the annual emissions of Italy and Belgium.¹³¹ Since the SPI is aiming for far-reaching changes in product manufacturing, it is only natural that the savings from this initiative are much higher than those of the present initiative.

4. Enforcement and implementation costs

The measures combined create fewer costs for enforcement authorities than their sum, because the package generates synergies in enforcement activities. While most costs are added up due to measures targeting different stakeholder groups (e.g. sellers, producers, repairers, etc.), the awareness raising costs can be reduced from EUR 5,750,000 to EUR 2,500,000 as communication campaigns can be more effectively designed to promote the set of measures instead of measures individually. The overall one-off enforcement costs of the combined measures would amount to EUR 10,639,944, including reduced costs for awareness raising, as well as cost for inspections. The ongoing enforcement costs over a period of 15 years would amount to EUR 94,879,049. It should be noted that M13a induces the highest costs for enforcement (30% of the total estimated for this package of measures EUR 105, 518 993) due to high one-off implementation costs associated to platform development.

5. The measures' coherence and other overarching impacts

The package of measures is fully coherent with the EU legal framework. M2 on preference for repair in the proportionality test is the only measure considered in the package that would be applicable for situations under the legal guarantee and would imply only an amendment of the SGD. The other measures come to complement existing initiatives, in particular the ECGT initiative, as consumers will benefit from more information on possibilities to repair.

¹³¹ https://eur-lex.europa.eu/resource.html?uri=cellar:ccd71fda-b1b5-11ec-9d96-01aa75ed71a1.0001.02/DOC_4&format=PDF (page 460).

5.3.4 Monitoring and evaluation plans

In accordance with the BRG's, the European Commission shall evaluate the effectiveness, efficiency, relevance, coherence and added value of the proposed interventions. This chapter proposes indicators aiming at monitoring the implementation of the package of measures. The market requires some time to adjust to the new requirements, thus it is recommended to gather the monitoring data not sooner than five years from the entry into force of the measures. Furthermore, the collection of data would enable data processing and preparation of the evaluation five years after entry into application.

The indicators are largely based on data relying on targeted consumer and business surveys. Mystery shopping (online and/or offline) would be required to collect data on sellers' practices. Consultations with other relevant stakeholders (i.e. market surveillance authorities, national authorities, industry organisations) should also be conducted.

Generally, the monitoring exercise should not be done in isolation for these interventions. In particular, links could be created between monitoring of this intervention and others that aim increasing sustainable consumption and manufacturing of more durable goods (e.g. ESPR, ECGT).

Table 40 - Monitoring indicators

Options:	Objective	Stakeholders concerned	Monitoring indicators	Data collection frequency	Actors responsible
All measures	Increase sustainable consumption	Consumers	– Share of consumers that repaired their goods in the last 24 months – Share of consumers that purchased second hand and refurbished goods – Number of repair services available in the MS over a given period – Average number of repairs conducted per year (within and beyond the legal guarantee)	Every two years	EC and MS
Horizontal	Make legislation futureproof	Policy makers	– Relevance of the intervention in the light of technological development	Every five years	EC
Horizontal	Ensure a coherent application of the EU legislation	Policy makers	– Number of consumer complaints linked to the initiative – Monitoring and compliance costs for national authorities	Yearly	EC and MS (policy makers and market surveillance authorities)
M2 – Preference for repair in the proportionality test	Increase repair rates (under the legal guarantee)	Producers and sellers - all products	– Share of sellers that provided repair as remedy under the legal guarantee as a result of the proportionality test – Share of sellers that provided repair outside this obligation – Regular consumer journey when the product is defective – Sellers' market practices when applying this rule	Every two years	EC and MS

Study to support the Commission's policy development on promoting repair of consumer goods and contracts in the data economy

Options:	Objective	Stakeholders concerned	Monitoring indicators	Data collection frequency	Actors responsible
M9a - Right to Repair (only Ecodesign products)	Increase repair rates (outside the legal guarantee)	Producers (manufacturers, importers) – Ecodesign	– Share of consumers that used their right in the last 24 months – Consumer awareness of their rights outside the legal guarantee – Consumer difficulties in using this right outside the legal guarantee	Every two years	EC and MS
M11 – Issuing a repair quote	Increase repair rates (outside the legal guarantee)	Repair services Manufacturers/sellers that offer repair services	– Average number of repair quotes requested by consumers on a yearly basis – Share of repair service providers offering quotes for free – Average quote price – Consumer awareness of the possibility to request a repair quote – Consumer experience with issuing a quote	Every two years	EC and MS
M12 – Obligation to inform where to repair	Increase repair rates (outside the legal guarantee)	Producers and sellers) – all products	– Consumer awareness of this obligation on producers and sellers – Producers and sellers' practices to inform where to repair (e.g. where information is displayed, accessibility)	Every two years	EC and MS
M13a – Platform with information on available repair services – national	Increase repair rates (outside the legal guarantee)	Repair services	– Average monthly visits from consumers – Share of repairs achieved through the platforms – Consumers' reasons for not using the platform – Consumers' use of cross-border repair services through the platform – Consumers' awareness of the platform	Yearly	MS
M14 – Voluntary commitments to an EU common 'easy repair standard'	Increase repair rates (outside the legal guarantee)	Repair services Manufacturers/sellers that offer repair services	– Number of businesses undertaking the voluntary commitments (yearly) – Impact of the standard on consumers' choice of repair services	Every two years	EU and MS

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