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Lifespan label for electrical products

Study on the effect of lifespan information for electrical products on the purchasing decision

wirksam regieren project group in the Federal Chancellery on behalf of the Federal Ministry for Environment, Nature Conservation, Construction and Nuclear Safety



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Executive summary 5

I. Research question 7

II. Study 9

Simulation of a purchasing decision	9
Lifespan	11
Lifespan label	11
A. Current regulation	12
B. Regulatory alternatives	12
(1) Labelling with lifespan label	12
(2) Labelling with lifespan label and total cost	12
(3) Labelling with guarantee label	13
C. Representative survey for evaluation of the lifespan label	14

III. Findings 16

A. Current regulation	16
B. Regulatory alternatives	18
(1) Labelling with lifespan label	20
(2) Labelling with lifespan label and total cost	25
(3) Labelling with guarantee label	28
C. Representative survey for evaluation of the lifespan label	30
Limits of the study	34
Summary of the findings	34

Endnotes	35
List of figures and tables	37

With citizens for citizens – *wirksam regieren* project group 38

Executive summary

The federal government has committed to promoting sustainable consumption, environmentally-friendly production and waste prevention. Some political measures are targeted at various actors, for example producers or consumers, others are targeted at product groups such as construction waste, packaging or waste paper.

Electrical and electronic devices are a varied and dynamic group of products which is characterised by ever decreasing life cycles, increasing sales figures and high recyclable material content¹. The Electrical and Electronic Equipment Act, amended at the end of 2015, governs the placing of these devices on the market, their withdrawal and their environmentally friendly disposal, for example.

Other measures could take action on transparent and easily comparable information for consumers, which can be relevant for the purchasing decision. This includes the lifespan of electrical products, which is difficult for the consumer to estimate². The Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB) is therefore discussing the possible introduction of standardised product labelling with the lifespan of electrical products in the “Interministerial Committee for Sustainable Consumption”. This indication would be for information purposes only, direct legal rights such as warranty rights could not be derived from it. The focus is on the aim of creating transparency through explicit specification of the lifespan and thus promoting the demand for and production of more sustainable products.

In order to provide evidence for the political decision-making process, the current study is investigating the question of:

What effect does lifespan information on electrical devices have on consumers' purchasing decisions? What effect do possible alternative provisions have?

The effect of a label indicating the lifespan of electrical products is investigated using the purchasing decisions in a simulated online shop situation with a representative sample of 10,444 consumers. The following regulatory alternatives were tested:

- 1 Voluntary or mandatory labelling with a lifespan label
- 2 Mandatory labelling with a lifespan label and total costs per year
- 3 Mandatory labelling with a guarantee

The lifespan label was developed on the basis of insights from behavioural science such that the information about the estimated lifespan is presented clearly and in an easy-to-understand manner. An alternative label which creates greater transparency for the consumer with regard to the relationship between price and lifespan by providing additional information about the average total cost per year was also designed.

1. The findings of the study show that products at the same price were purchased more often if they have a longer lifespan. However, consumers were only willing to choose a more expensive product for the benefit of a longer lifespan to a limited extent. The purchase of products in a higher price-lifespan segment increased by three percent in comparison with a reference group with no lifespan information.
2. Combining the information on a product's lifespan with information about the average total cost per year for acquisition and operation had a more marked effect on purchasing behaviour. It increased the purchase of products in a higher price-lifespan segment by five percentage points.
3. In contrast, a guarantee obligation on the lifespan of the product did not increase the consumers' willingness to purchase a product in a higher price-lifespan segment.

The findings indicate that the lifespan is not able to prevail over the price in purchasing decision-making processes. The additional indication of the total cost, in which the lifespan information is included in the cost consideration, suggests itself as an alternative regulation. This cost transparency allows for a price-performance comparison beyond the lifespan and thus makes it easier to compare products.



I. Research question

The Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety commissioned the *wirksam regieren* project group to empirically test the effect of a lifespan label and possible alternatives in a variety of situations in order to gather evidence for the question of introduction of lifespan information. A *preliminary test* of a possible introduction made it possible to identify effective and ineffective regulatory alternatives and improve them where applicable.

This study builds on research findings which indicate that information on product lifespan is included in the purchasing decision and could lead to more sustainable consumption³. The study investigates the purchasing behaviour of consumers in a realistic purchasing decision situation, in which a multitude of product features are taken into consideration.

The following questions were investigated:

1 Labelling with lifespan label

What effect does labelling of the lifespan as estimated by the manufacturer have on consumers' purchasing decisions? Does labelling with a lifespan label result in increased demand for products with a long lifespan? Can the lifespan prevail over the price as a decision-making criterion? Do voluntary and mandatory labelling have different effects?

2 Labelling with lifespan label and total costs per year

What effect does the combination of information concerning the lifespan and the total costs per year (acquisition costs, energy and water consumption where applicable) have on purchasing behaviour? Does information concerning the total costs reinforce the effect of the lifespan information?

3 Labelling with guarantee label

What effect does a guarantee obligation associated with legal entitlements on the product lifespan have with regard to the purchasing decision? What effect would a guarantee have in comparison with non-binding specification of the lifespan?



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II. Study

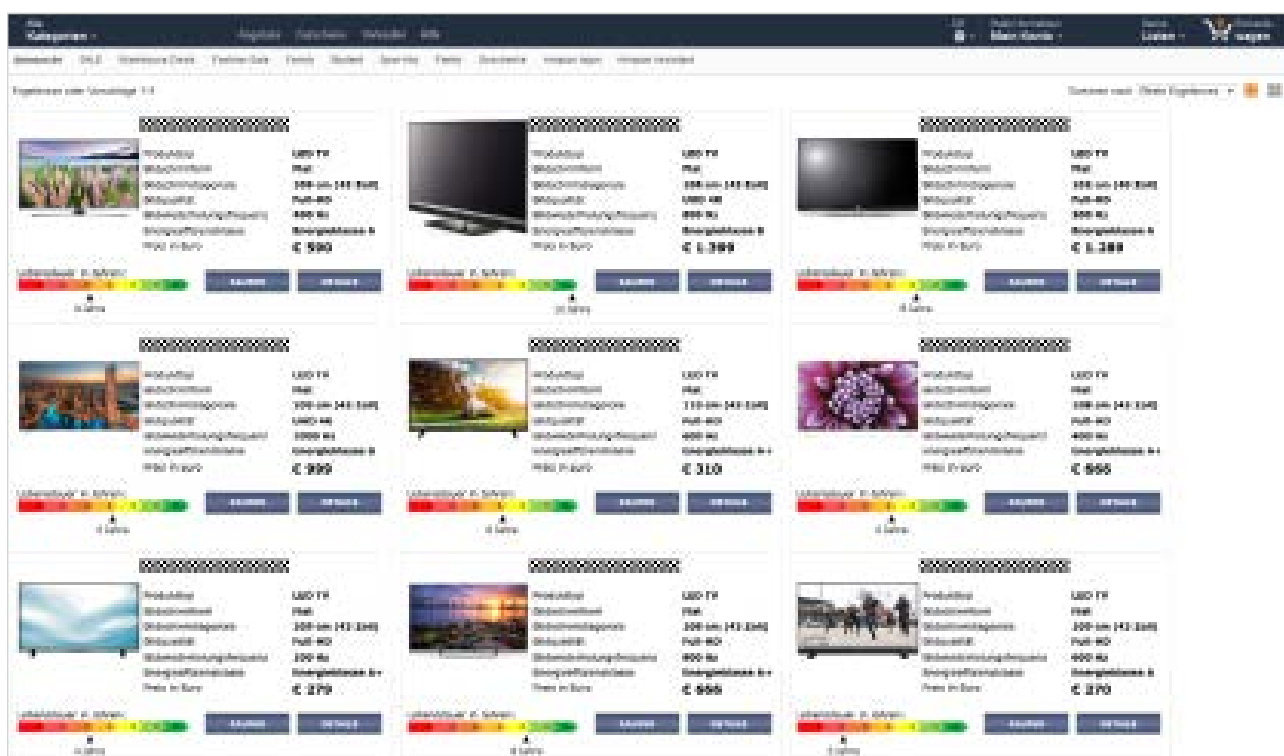
10,444 consumers took part in this study. The sample is representative of the total population with regard to the socio-economic characteristics of age, gender and region (for sample characteristics see *material volume A 1*).

Simulation of a purchasing decision

Behavioural science studies show⁴ that survey findings regarding ecological and energy efficiency labels are particularly significantly affected by the effects of socially desirable response behaviour. Here, the respondents tend towards responses which correspond to subjectively perceived social values – regardless of how they would behave in the actual decision-making

situation. In order to keep the problem of socially desirable responses to a minimum, a study design in which the participating consumers were put into a realistic purchasing situation was selected. To this end, an online portal was created according to the example of one of the most frequently used online shops in the German market (see *Figure 1*). The consumers were asked to choose the product from among the offerings on the online portal which they would buy if they needed a new device in each of the four categories of “washing machines”, “televisions”, “kettles” and “vacuum cleaners”. The consumers then indicated which criteria were most important for their product selection (see *material volume A 2*).

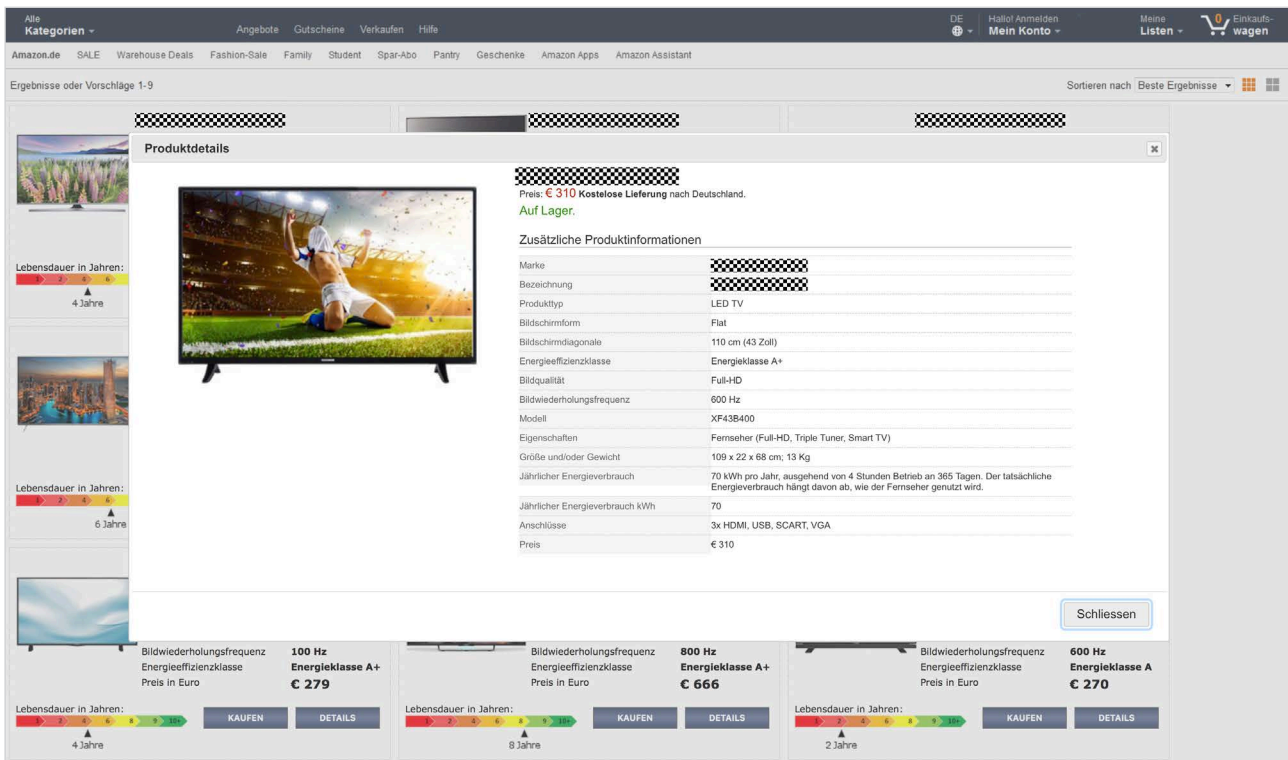
Figure 1: Screen showing the simulated online shop



When choosing a product, e.g. a television, the consumers always had nine different products to choose from. The most realistic conditions possible were generated with regard to the products on offer. Three products each in the bottom, middle and high price segments⁵, each with their real features and brand names, were offered. These products were particularly

frequently purchased from one of the biggest online retailers in the German market during the observation period. The participating consumers could find information about the items in the same manner as for a real online purchase. Additional information about each product could be obtained by clicking on the “Detail” button (see Figure 2).

Figure 2: Screen showing product details



Lifespan

In order to investigate the effect of the lifespan on the consumers' decision-making behaviour, the specified lifespan of the products was systematically varied. All other product features including the prices were kept the same. Differences in purchasing behaviour could therefore be attributed to the lifespan information.

Current data on the lifespan of electrical products shows that longer-lasting products tend to be more expensive; i.e. lifespan and price are positively but not perfectly correlated⁶. Accordingly, the following price-lifespan segments were established for this study:

- Bottom price-lifespan segment: products in the bottom price segment were allocated very short, short and average lifespans.
- Middle price-lifespan segment: products in the middle price segment were allocated short, average and long lifespans.
- Top price-lifespan segment: products in the top price segment were allocated average, long and very long lifespans.

It was therefore taken into account that products with longer lifespans are often more expensive than those with shorter lifespans. On the other hand, instances in which a cheap product can have a lifespan which is very long for the price segment and instances in which an expensive product has a lifespan which is relatively short for the price segment were also included.

The range of lifespans differs according to the product group. For example, the range of lifespans for a washing machine according to current data is between three and 20 years, the range of lifespans for a kettle is just two to 10 years⁷.

Lifespan label

The lifespan of electrical products is not immediately apparent and is therefore difficult to compare. In order to be able to make an informed purchasing decision, information regarding lifespan is currently lacking.

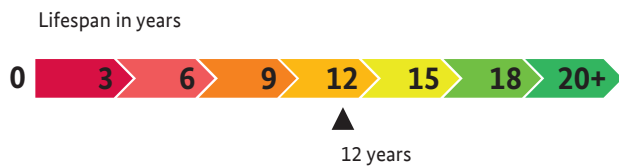
The explicit labelling of products with a lifespan label should therefore create transparency with regard to lifespan for consumers and make it easier to compare products. To this end, products would be labelled with a lifespan estimated by the manufacturer which is legally non-binding. For this, the manufacturer would have to monitor the lifespan of its products on the market or determine it during the course of product testing.

Building on the current state of research, the *wirksam regieren* project team developed a lifespan label in cooperation. The label should indicate the lifespan information as clearly and comprehensibly as possible in collaboration with the BMUB (Federal Ministry for the Environment, Nature Conservation, Construction and Nuclear Safety) and the Federal Environment Agency (UBA).

Research findings suggest that a lifespan label which is fundamentally based on the design of the European energy efficiency label can fulfil this requirement. In a comparison of four different lifespan indications, the test label which was based on the European energy efficiency label got the most attention⁸. However, owing to its almost identical design, some consumers confused the test label with exactly this energy efficiency label. In addition, one third of the respondents did not correctly understand the category information for the lifespan.

For this study, therefore, a label which provides the lifespan in years in an easy-to-understand manner was developed. At the same time, it takes up central aspects of the widely known and trusted energy efficiency image, in particular the colour gradient from red to green. The classification of the information provided is made easier through this optical alignment with the energy efficiency label. Studies show that familiar patterns, shapes and colours help people to process information. In this manner, clarity and effectiveness were combined. *Figure 3* shows the lifespan label for this study on the example of a washing machine. The lifespan labels for the three other product groups differ only with regard to the applicable range of lifespans (see *material volume A 3*).

Figure 3: Lifespan label



In the simulated purchasing situation, alternative regulations were tested. To this end, the consumers were divided into various test groups and each presented with a regulatory alternative. The consumers were randomly assigned to the test groups.

A. Current regulation

As a basis for comparison of the findings, consumers were allocated to a reference group which saw the normal market product information without a label showing the lifespan.

- *Reference group: none of the products were labelled with the lifespan label or the guarantee label.*

B. Regulatory alternatives

1 Labelling with lifespan label

In order to test the effect of the lifespan label under a variety of conditions, three scenarios were compared: For two test groups, it was assumed that the lifespan label is introduced and the labelling is voluntary for the manufacturer.

- *Test group 1: Voluntary labelling with a lifespan label – a minority of the products (3 out of 9 products) are labelled with the lifespan label. It was assumed that the manufacturers of those products with a high lifespan relative to their competition in this price segment would voluntarily label their products.*
- *Test group 2: Voluntary labelling with a lifespan label – a majority of the products (6 out of 9 products) are labelled with the lifespan label. The same assumption applies with regard to voluntary labelling by the manufacturer.*

In order to be able to estimate the effect of mandatory labelling with the lifespan label in comparison with voluntary labelling, the scenario for a third test group was based on a labelling requirement.

- *Test group 3: Labelling with lifespan label – all products are labelled with the lifespan label. In this scenario, all nine products have information about the lifespan as a result of the requirement.*

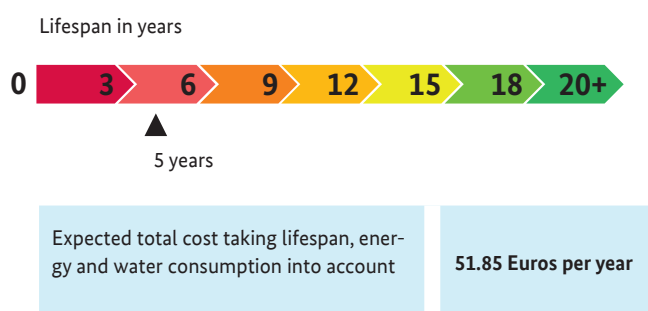
2 Labelling with lifespan label and total costs per year

When buying electrical products, the price plays a central role for many consumers. As a result, the acquisition costs spread over the useful life and the annual operating costs can also be particularly important information for consumers. In order to create transparency, a combined lifespan and total cost label was developed and tested. The additional information concerning the total costs – in a similar manner to the base price regulation – also offers a single user-friendly measure for comparing various products.

- *Test group 4: all products are labelled with the lifespan label and the total costs per year.*

Figure 4 shows this labelling variant on the example of a washing machine with a five-year lifespan and a total cost of 51.85 Euros per year. The average annual costs for acquisition and operation (electricity and water) of a device were calculated. The acquisition costs were spread across the lifespan in years and added to the annual operating costs. The operating costs were determined based on the standardised information from the European energy label regarding consumption figures for electricity and water⁹. The basis was an average electricity price of 0.275 Euros per kilowatt hour and an average water price of 1.75 Euros per cubic metre.

Figure 4: Lifespan label and total costs per year



3 Labelling with guarantee label

The lifespan information to be tested is non-binding. This non-binding nature and the fact that the lifespan would be estimated by the manufacturer itself rather than by an independent third party could result in a lack of trust in the lifespan information. Owing to this aspect, labelling with a guarantee was tested as another alternative¹⁰. In contrast to lifespan information, the guarantee is trusted by consumers and is also associated with concrete legal rights. At the same time, the guarantee period is generally less than the estimated lifespan. The comparative test made it possible to evaluate the effect of binding guarantee information in comparison to mandatory labelling with a lifespan label.






- *Test group 5: all products are labelled with a guarantee label.*

In accordance with the conditions in the market, the guarantee period for this study was specified by the UBA for each product such that it was systematically lower than the lifespan. In a previous study, the guarantee had far less of an effect on product selection than expected¹¹. The reason for this remained unclear. It is possible that the participants in the study reacted to the following information in the questionnaire: “Manufacturers determine which parts and services are covered by the guarantee and how long it applies for.” Although this information is factually correct, according to the authors the wording may have left the participants uncertain as to whether it was a standard guarantee. In this study, the guarantee was tested firstly in the most realistic purchasing decision-making situation possible and secondly using a guarantee label rather than a text. The design of the guarantee label was developed in collaboration with the BMUB and the UBA and was based on standard designs (see Figure 5 and material volume A 4).

Figure 5: Guarantee label



Table 1: Overview of reference group and test groups

no label	Reference group: current regulation		
	The consumers in the reference group received the product information in accordance with the current presentation on the market – without a lifespan or guarantee label.		
Lifespan in years	Test group 1: voluntary labelling – lifespan label on a minority of products		
	Only 3 of the 9 products were voluntarily labelled with a lifespan label by the manufacturer. These products had a long lifespan relative to competitors' products in the same price segment.		
Lifespan in years	Test group 2: voluntary labelling – lifespan label on a majority of products		
	The majority of the products (6 out of 9) were voluntarily labelled with a lifespan label by the manufacturer. These products had a long lifespan relative to competitors' products in the same price segment.		
Lifespan in years	Test group 3: mandatory labelling – lifespan label		
	All products were labelled with a lifespan label as a result of a requirement.		
Lifespan in years	Test group 4: mandatory labelling – lifespan label and total costs per year		
	All products were labelled with a lifespan label as well as with the total cost per year as a result of a requirement.		
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Expected total cost taking lifespan, energy and water consumption into account:	X Euro per year		
	Test group 5: mandatory labelling – guarantee label		
	All products were labelled with a guarantee.		

C. Representative survey for evaluation of the lifespan label

The consumers were then asked for their assessment and opinion with regard to an introduction of the lifespan labels.

The study was carried out on behalf of the Federal Environment Agency as part of the Federal Ministry for the Environment, Nature Conservation, Construction and Nuclear Safety's departmental research plan (research identification number 3716 37 311 2) and was financed using federal funds. Designing of the study and data analysis were done by the *wirksam regieren* project group. The data was collected by the service provider GfK. A material volume for this report, which allows for more in-depth insights into the study, is available¹².



III. Findings

In the analysis, the purchasing decisions made by the consumers in the test groups were compared with the reference group’s purchasing decisions.

A. Current regulation

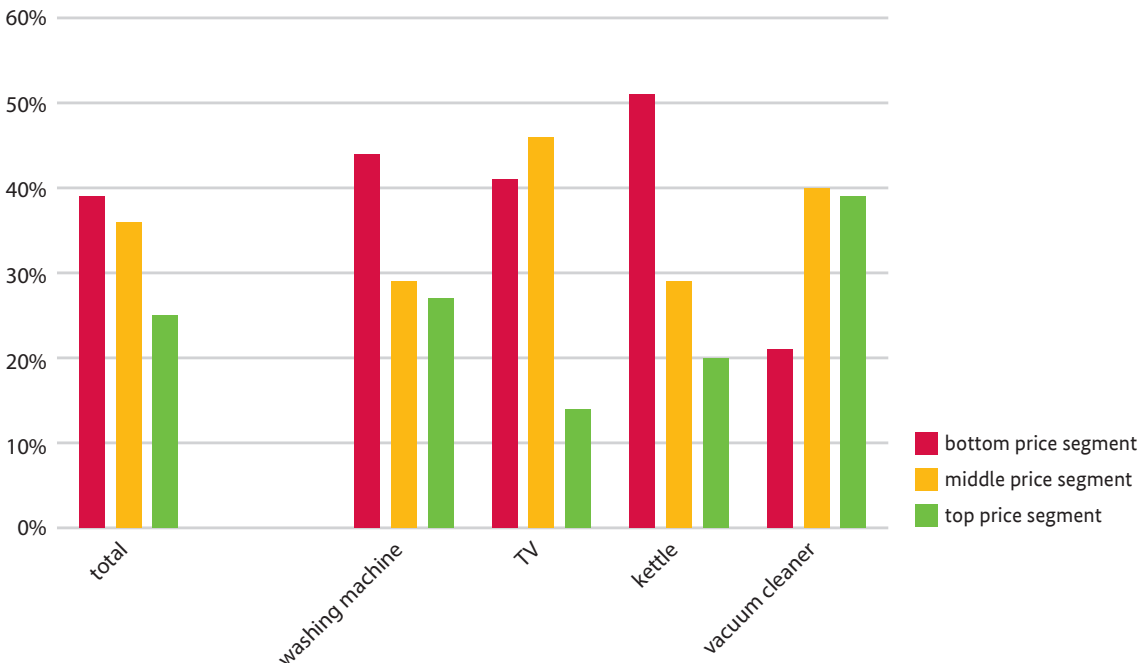
Reference group: purchasing decisions and decision-making criteria

The reference group reflects the current situation on the market, in which no information concerning the lifespan of electrical products is provided. In the reference group, an average of 39 percent of the consumers purchased

a product from the bottom price segment, 36 percent purchased a product from the middle price segment and 25 percent purchased a product from the top price segment across all four product categories.

Individuals with a higher income tended to opt for more expensive products more often. Gender, age and education had no significant impact on the purchasing behaviour in the reference group. The size of the household only had an impact on the purchasing of vacuum cleaners: individuals with larger households tended to purchase more expensive vacuum cleaners (see *material volume A 5* for sub-group analysis).

Figure 6: Purchasing decisions in the reference group by product group



The distribution of the purchasing decisions across the various price segments differed significantly according to the product category ($\chi^2 = 121.01$; $df = 6$; $p < 0.001$): In washing machines, for example, the majority of consumers (44 percent) opted for a cheap product, 29 percent opted for a product in the middle price segment and 27 percent opted for a product in the top price segment. In kettles, cheap devices were predominantly chosen, in televisions the majority of people chose products in the middle and bottom price segments. In contrast, products in the middle and top price segments were predominantly purchased for vacuum cleaners (see *Figure 6*).

In the reference group, the consumers stated the price, energy efficiency class and brand of the device as the main reasons for their choice. The lifespan, which was not provided to the consumers in the reference group as information and which they had to estimate themselves was named much less often as the most important decision-making criterion in the purchasing process. Four percent of consumers gave the lifespan as a deciding factor for or against a washing machine (see *Figure 7*).

Price, energy efficiency and brand were also named as the main decision-making criteria when purchasing a television. The lifespan was only named as a deciding factor by one percent of the consumers (see *Figure 8*).

Figure 7: Main decision-making criteria when purchasing a washing machine in the reference group

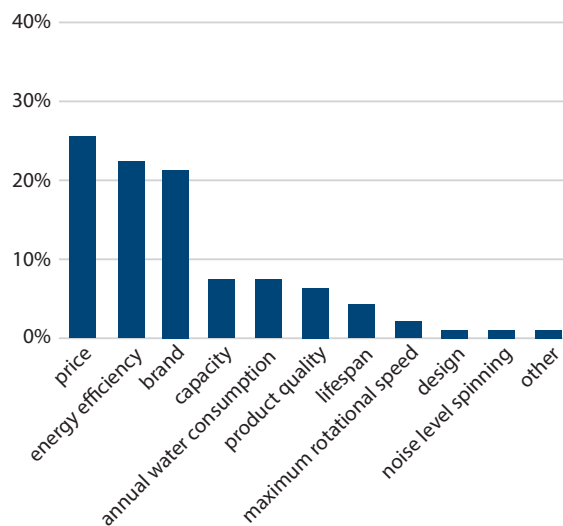
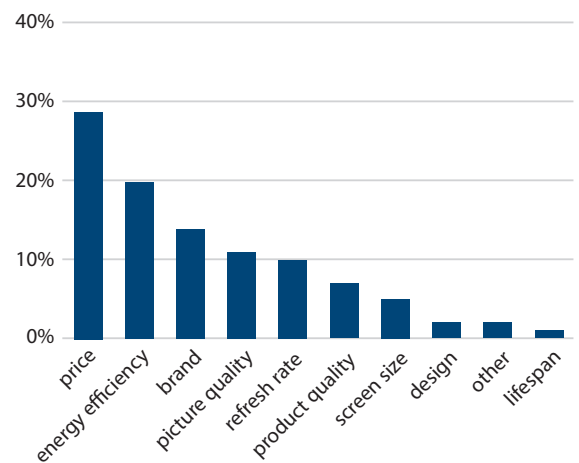


Figure 8: Main decision-making criteria when purchasing a television in the reference group



When purchasing kettles, the price was the most important factor by far, followed by quality and design. Here too, the lifespan played a minor role for most consumers (see *Figure 9*).

Unlike in the other product groups, energy efficiency played the most important role for a significantly larger proportion of the consumers when purchasing vacuum cleaners. The price and system (bagless/with bag) also mattered. The lifespan was counted among the most important decision-making criteria by 2 percent of the consumers (see *Figure 10*).

B. Regulatory alternatives

Is a product bought more often if it has a longer lifespan?

In order to investigate the effect of a longer lifespan on the attractiveness of a specific product, tests were first carried out to determine if the same product would be bought more often at the same price but with a longer lifespan. To this end, all products were given a mandatory lifespan label (test group 3). Previous studies with stylised, unbranded products already suggested this¹³.

Figure 9: Main decision-making criteria when purchasing a kettle in the reference group

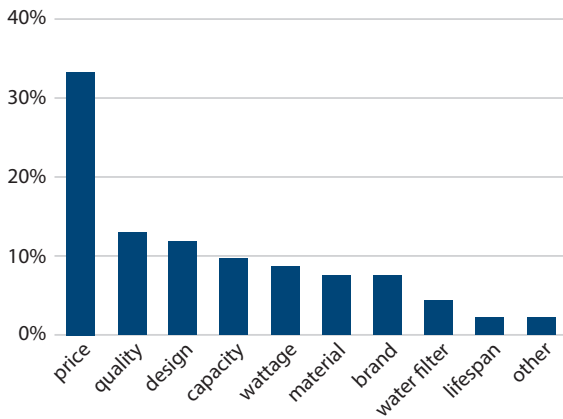
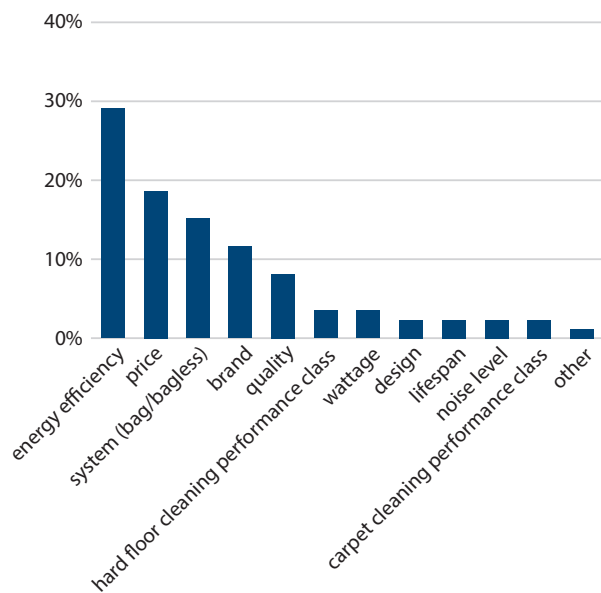


Figure 10: Main decision-making criteria when purchasing a vacuum cleaner in the reference group



Tables 2 to 4 show the distribution of the purchasing decisions per product for various lifespans in the example of the “washing machines” product group in test group 3. In the test, the consumers saw the real

available products with brand names, images and all of the product information provided as standard for online purchases; the brand names are deliberately not specified in this report.

Table 2: Distribution of purchasing decisions per product with various lifespans and the same price – bottom price segment

Lifespan				
	very short, 5 years	short, 7 years	medium, 10 years	Magnitude of effect
Washing machine 1 Price: 299 Euros	22%	30%	48%	$w^2 = 0.11$
Washing machine 2 Price: 309 Euros	16%	25%	58%	$w^2 = 0.30$
Washing machine 3 Price: 334 Euros	21%	30%	49%	$w^2 = 0.09$

Table 3: Distribution of purchasing decisions per product with various lifespans and the same price – middle price segment

Lifespan				
	short, 7 years	medium, 10 years	long, 15 years	Magnitude of effect
Washing machine 4 Price: 459 Euros	21%	29%	50%	$w^2 = 0.13$
Washing machine 5 Price: 529 Euros	15%	28%	57%	$w^2 = 0.28$
Washing machine 6 Price: 649 Euros	21%	28%	51%	$w^2 = 0.15$

Table 4: Distribution of purchasing decisions per product with various lifespans and the same price – top price segment

Lifespan				
	medium, 10 years	long, 15 years	very long, 20 years	Magnitude of effect
Washing machine 7 Price: 729 Euros	20%	25%	55%	$w^2 = 0.22$
Washing machine 8 Price: 759 Euros	19%	23%	59%	$w^2 = 0.29$
Washing machine 9 Price: 855 Euros	25%	34%	41%	$w^2 = 0.04$

The findings confirm that a product was purchased significantly more often if it had a longer lifespan. E.g. washing machine 1 was purchased much more often when it was labelled with a medium lifespan and therefore had the longest lifespan in its price-lifespan range (48 percent of the purchases of washing machine 1) than when it was labelled with a very short (22 percent) or short lifespan (30 percent). The findings in the “television”, “kettle” and “vacuum cleaner” product groups are equivalent. Here, the magnitude of effect varies depending on the product between a small ($w^2 = 0.04$) and a big effect ($w^2 = 0.30$) (see *material volume A 6* for an overview of the distribution and magnitude of effect broken down by product and regulatory alternatives).

These findings confirm that a longer lifespan at the same price has a positive effect on the sale of a product and can increase the competitiveness of the product.

Would the consumers be willing to consider a higher price in the interests of a longer lifespan?

As the findings of studies show¹⁴, however, a longer lifespan for products on the market is often associated with a higher price. For the possible introduction of a lifespan label, this leads to the question of whether the consumers would opt for a product with a higher price in the interest of a longer lifespan. A second stage therefore tested whether the consumers would also be willing to choose a product from a higher price-lifespan segment in the interest of a longer lifespan.

In order to answer this question, the purchasing decisions and decision-making criteria for the consumers in the test groups 1 to 5 were compared with those of the reference group.

1 Labelling with lifespan label

Test group 1: purchasing decisions and decision-making criteria

In test group 1, in which a minority of the products were voluntarily labelled with a lifespan label, 42 percent of the consumers opted for a product in the bottom price-lifespan segment, 34 percent for a product in the middle price-lifespan segment and 24 percent for a product in the top price-lifespan segment. Here, there was no statistically significant difference in comparison with the purchasing behaviour in the reference group ($\chi^2 = 2.79$; $df = 2$; $p > 0.05$). The same applies when you look at the product groups individually (washing machines: $\chi^2 = 2.45$; $df = 2$; $p > 0.05$; televisions: ($\chi^2 = 0.13$; $df = 2$; $p > 0.05$; kettles: $\chi^2 = 1.14$; $df = 2$; $p > 0.05$; vacuum cleaners: $\chi^2 = 6.02$; $df = 2$; $p = 0.05$).

The proportion of consumers for whom the lifespan was of high relevance for the purchasing decision, at 2 to 4 percentage points, was only slightly higher than in the reference group (see *material volume A 7*).

If only a minority of manufacturers were to use a lifespan label, it must be assumed that the purchasing behaviour of consumers would not change.

Test group 2: purchasing decisions and decision-making criteria

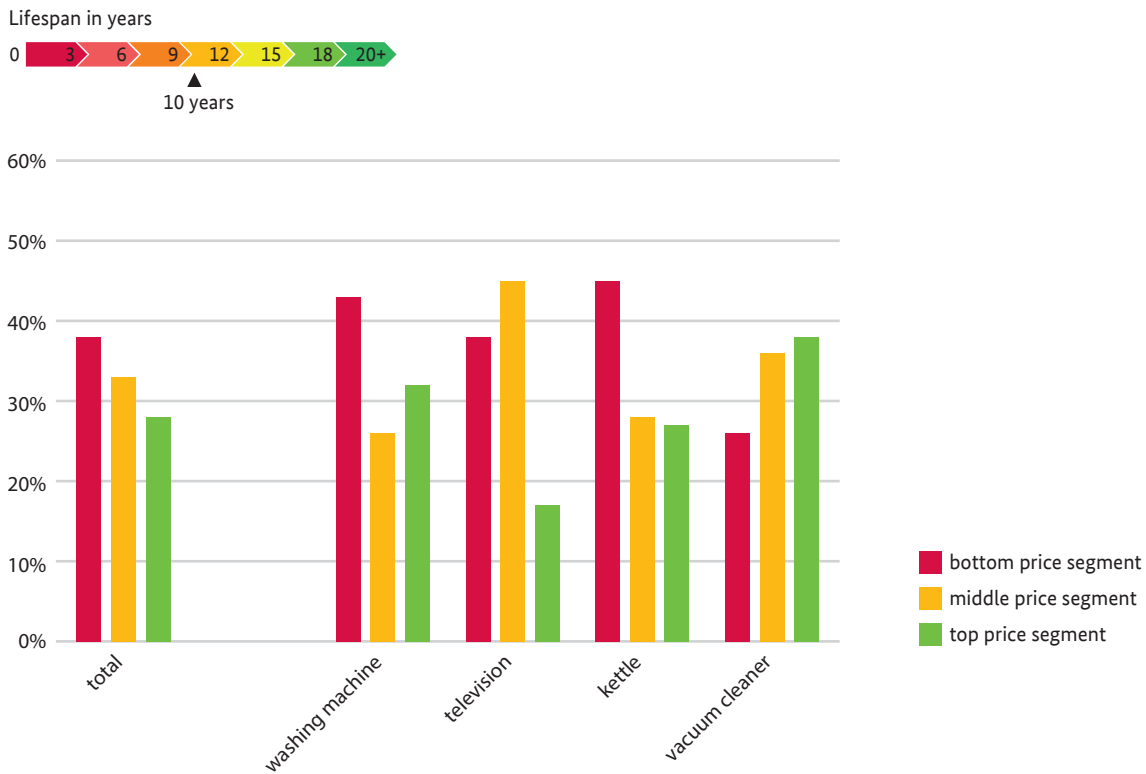
In test group 2, in which a majority of the products were voluntarily labelled with a lifespan label, 39 percent of the consumers opted for a product in the bottom price-lifespan segment, 34 percent for a product in the middle price-lifespan segment and 27 percent for a product in the top price-lifespan segment. When you look at the product groups individually, there is a slight, statistically significant positive effect in the kettle product group ($\chi^2 = 7.04$; $df = 2$; $p < 0.05$). At the same time, there is a slight, statistically significant negative effect for vacuum cleaners (vacuum cleaners: $\chi^2 = 7.19$; $df = 2$; $p < 0.05$). For washing machines and televisions, no statistically significant change in purchasing behaviour could be discerned (televisions: $\chi^2 = 2.79$; $df = 2$; $p > 0.05$; washing machines: $\chi^2 = 0.87$; $df = 2$; $p > 0.05$). Looking at all product groups as a whole, these effects cancel each other out ($\chi^2 = 4.87$; $df = 2$; $p > 0.05$).

Even if a majority of providers were to label their products with a lifespan label, no statistically significant difference would be expected

in comparison with the reference group, i.e. in comparison with the current regulation.

However, the proportion of consumers who said that the lifespan was the most important criterion to them was five to nine percentage points higher, depending on the product group, than in the reference group (see *material volume A 7*). This suggests that the importance of the lifespan in the decision-making process increases with the increasing proportion of labelled products on the market.

Figure 11: Purchasing decisions – mandatory lifespan label



Test group 3: purchasing decisions and decision-making criteria

What effect should be expected from mandatory labelling with the lifespan label, i.e. in a situation in which every product bears a lifespan label? In test group 3, 38 percent opted for a product in the bottom price-lifespan segment, 33 percent for a product in the middle price-lifespan segment and 29 percent for a product in the top price-lifespan segment (see Figure 11).

Individuals with a higher income, higher level of education, larger households and men tend to opt for products in the middle and top price-lifespan segment more often (see material volume A 5).

In comparison with the reference group, this is an increase of three percentage points in the top price-lifespan segment’s share. In the reference group, 25 in 100 consumers purchased a product from the top price-lifespan segment, in this test group it was 28 in 100 consumers. This equates to a 12 percent increase. Here, the shift from the middle to the top price-lifespan segment was most marked. This indicates that the effect to be expected from a lifespan label is greater for purchasing decisions between products in the middle and top price-lifespan segments and is lower for purchasing decisions between products in the bottom and middle price-lifespan segments.

Across all product groups, the increase in sales of products in a higher price-lifespan segment is statistically significant. However, the effect is small ($\chi^2 = 9.01$; $df = 2$; $p < 0.05$).

Figure 12: Difference in purchasing decisions in percentage points – lifespan label vs. reference group



Separate consideration of the individual product groups makes the reason for the small effect clear (see Figure 12): it is only the kettles product group in which an increase in the purchases of high-quality products by around seven percent is measurable in comparison with the reference group. This effect is statistically significant ($\chi^2 = 9.30$; $df = 2$; $p < 0.05$). For all other product groups, the changes are not statistically significant (washing machines: $\chi^2 = 3.85$; $df = 2$; $p > 0.05$; televisions: $\chi^2 = 2.97$; $df = 2$; $p > 0.05$; vacuum cleaners: $\chi^2 = 5.15$; $df = 2$; $p > 0.05$).

The consumers in test group 3 stated the price, energy efficiency class and lifespan as the most important reasons for purchasing a washing machine. The brand was named as the most important criterion fourth most frequently. In comparison with the reference group, therefore, the importance of lifespan in the purchasing decision increased significantly. Around 16 percent of consumers, compared with around four percent, stated the lifespan as the most important deciding factor when purchasing a washing machine. Lifespan also demonstrated significantly higher importance as a decision-making criterion in the purchasing of televisions, kettles and vacuum cleaners. The proportion of consumers who named the lifespan as the most important deciding factor increased by 12 to 15 percent, depending on the product group, in comparison with the reference group.

Figure 13: Main decision-making criteria when purchasing a washing machine in test group 3

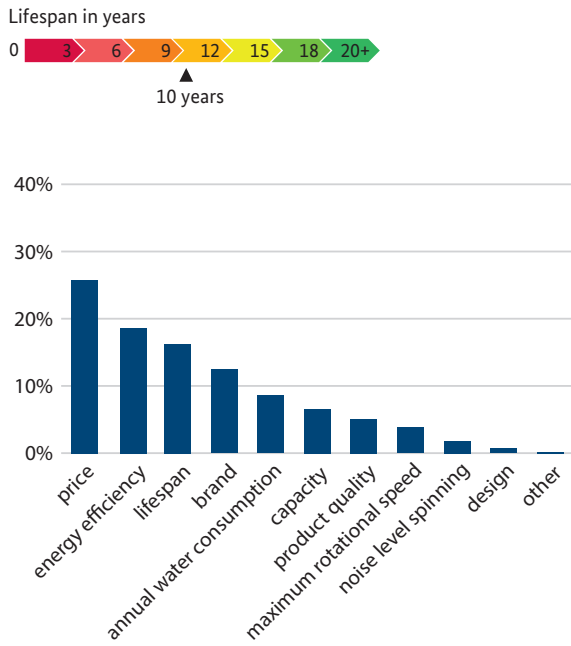


Figure 14: Main decision-making criteria when purchasing a television in test group 3

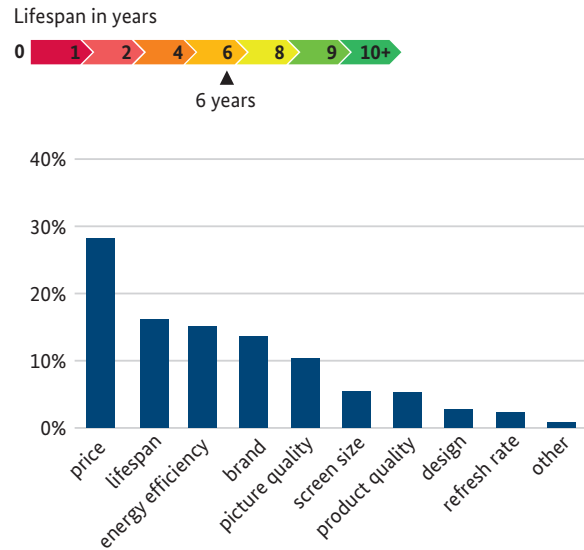


Figure 15: Main decision-making criteria when purchasing a kettle in test group 3

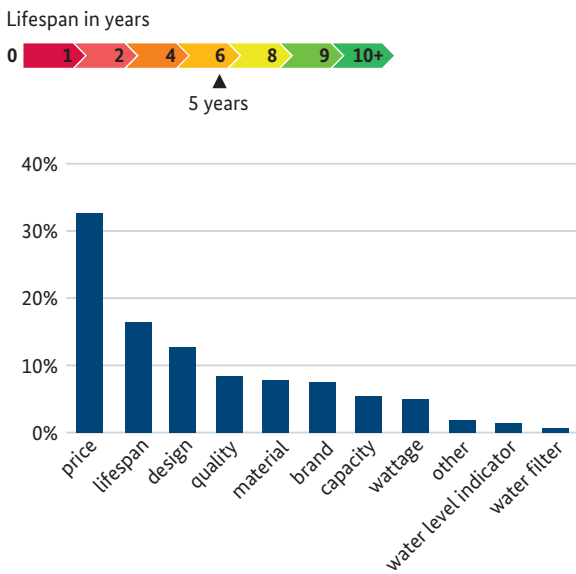
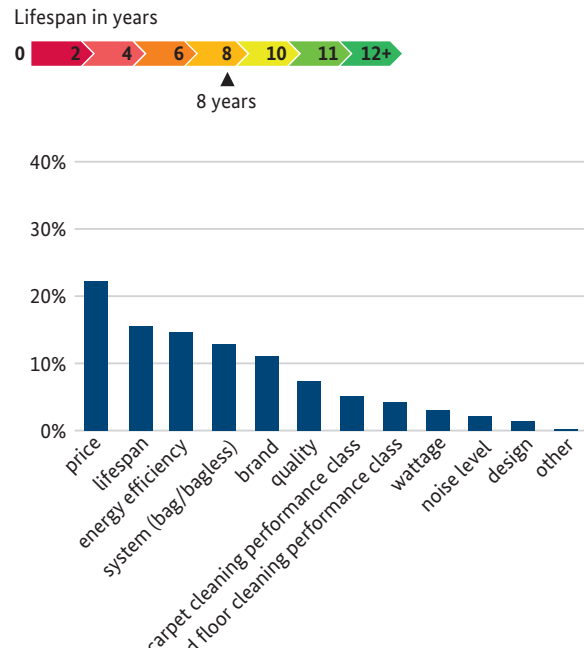


Figure 16: Main decision-making criteria when purchasing a vacuum cleaner in test group 3



Although the lifespan was named significantly more often as the most important decision-making criterion here than in the reference group and in the test groups in which only some of the products were labelled with the lifespan label, the lifespan label only affected the purchasing decision to a limited extent.

For most consumers, the price was more important. This suggests that, in complex purchasing decision-making processes, the lifespan label can only prevail over other product features, in particular over the price to a limited extent.

2 Labelling with lifespan label and total costs per year

Test group 4: purchasing decisions and decision-making criteria

In test group 4, in which the products were labelled with a lifespan label and average total costs per year, 37 percent opted for a product in the bottom price-lifespan segment, 33 percent for a product in the middle price-lifespan segment and 30 percent for a product in the top price-lifespan segment.

Much like the findings in test group 3, individuals with a higher income, higher level of education, larger households and men tended to opt for products in the middle and top price-lifespan segment more often (see *material volume A 5*).

In comparison with the reference group, this equates to a drop of around two and three percentage points for products from segments with a low or middle price in favour of an increase of five percentage points for purchases in the top price segment. This increase

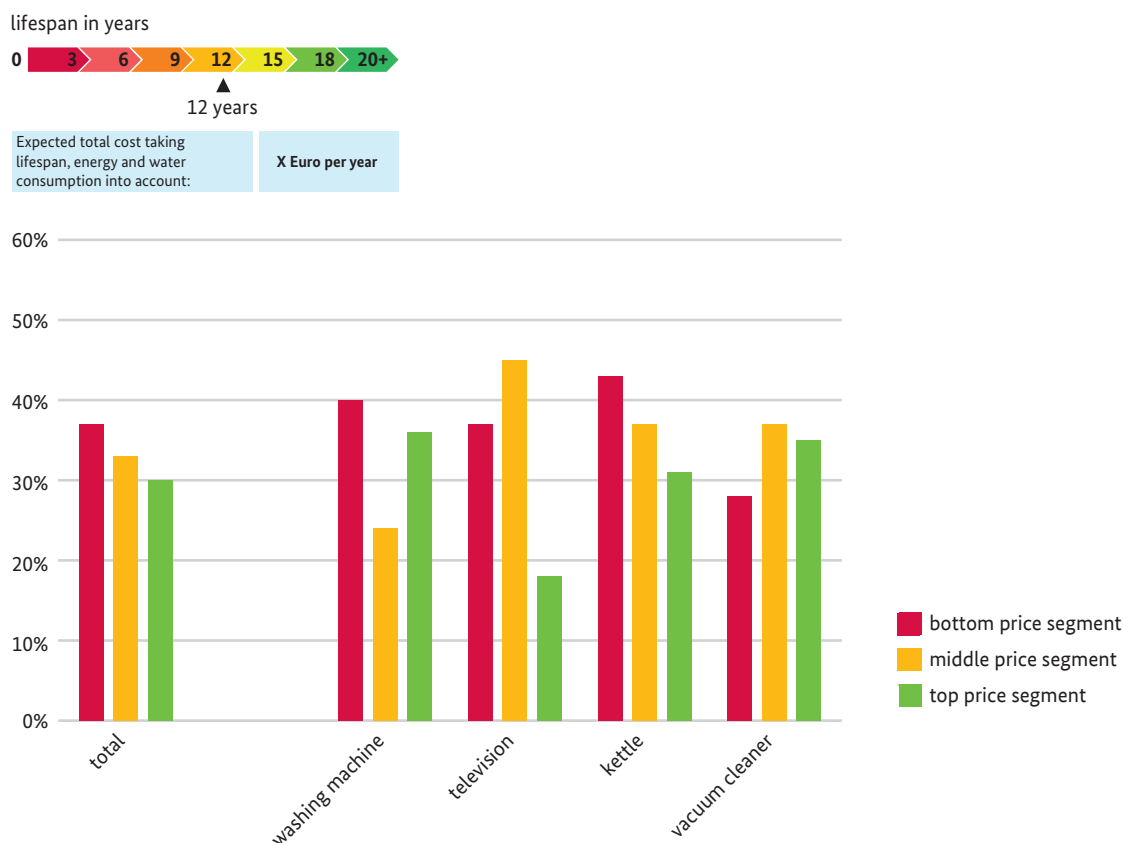
is statistically highly significant ($\chi^2 = 15.85$; $df = 2$; $p < 0.001$). In the reference group, 25 in 100 consumers purchased a product from the top price-lifespan segment, while this was 30 in 100 consumers with labelling with the lifespan label and total costs. This equates to a 20 percent increase. Here too, the shift from the middle to the top price-lifespan segment was most marked (see *Figure 18*).

The increase in high-quality product purchases was particularly significant for kettles ($\chi^2 = 18.88$; $df = 2$; $p < 0.001$). The sales in the top price-lifespan segment were 11 percentage points higher than in the reference group.

The sale of washing machines in the top price-lifespan segment was also significantly higher than in the reference group and rose by 9 percentage points ($\chi^2 = 12.84$; $df = 2$; $p < 0.005$).

The sale of longer-lasting televisions increased, but not statistically significantly ($\chi^2 = 4.44$; $df = 2$; $p > 0.05$).

Figure 17: Purchasing decisions – lifespan label and total costs per year



In contrast, for vacuum cleaners, more purchases were made in the bottom price-lifespan segment (7 percentage points) and fewer purchases were made in the middle and top price-lifespan segments in comparison with the reference group ($\chi^2 = 8.32$; $df = 2$; $p < 0.05$) (see Figure 18). This finding corresponds to the effect of the lifespan label on the purchase of vacuum cleaners in test group 3, where the sales of products in the bottom price-lifespan segment likewise increased.

In comparison with test group 3, in which the products were only labelled with the lifespan label, the importance of the lifespan in the purchasing decision increased by 1 percentage point across all four product groups. In contrast, the total costs increased significantly in importance, namely by 11 percentage points (see Figures 19–22).

Figure 18: Difference in purchasing decisions in percentage points lifespan label and total costs vs. reference group

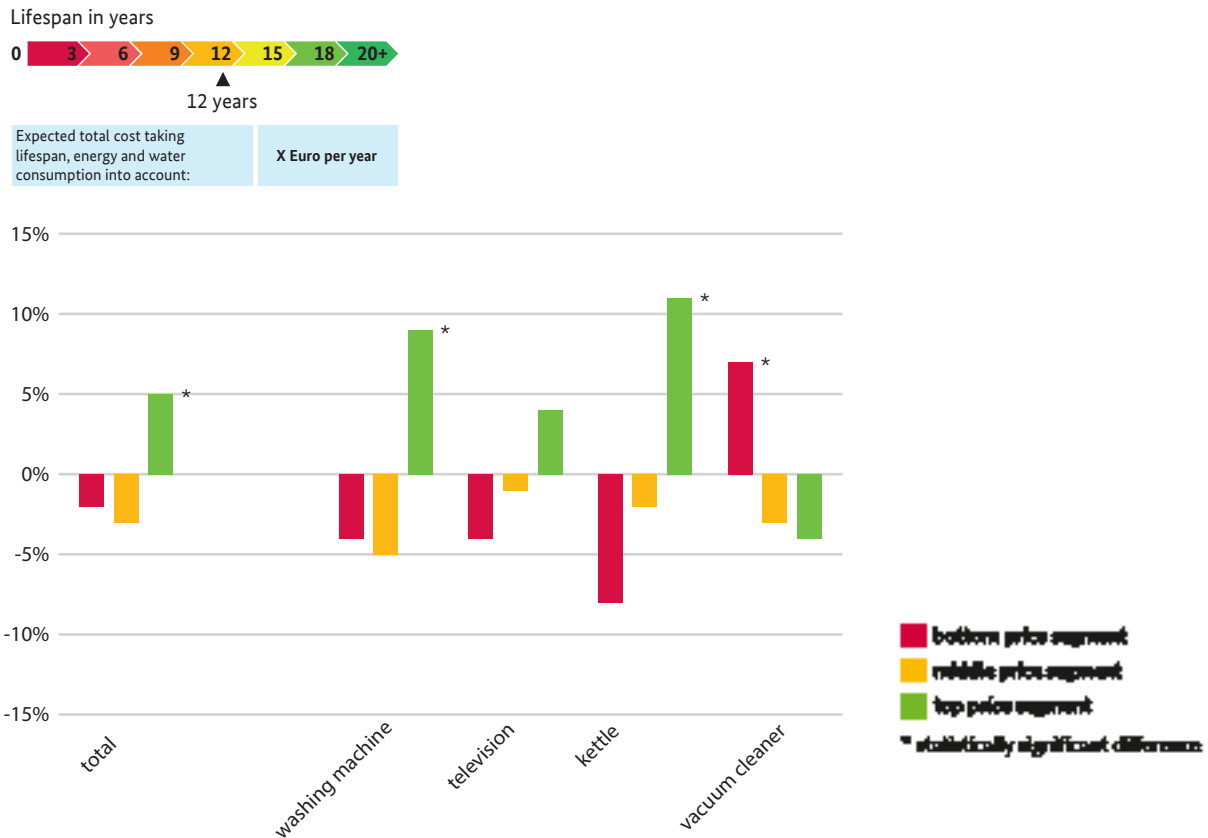


Figure 19: Main decision-making criteria when purchasing a washing machine in test group 4

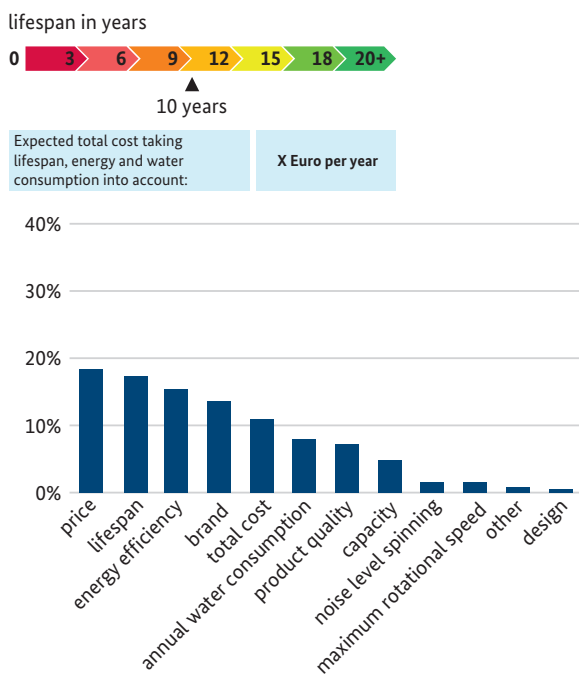


Figure 20: Main decision-making criteria when purchasing a television in test group 4

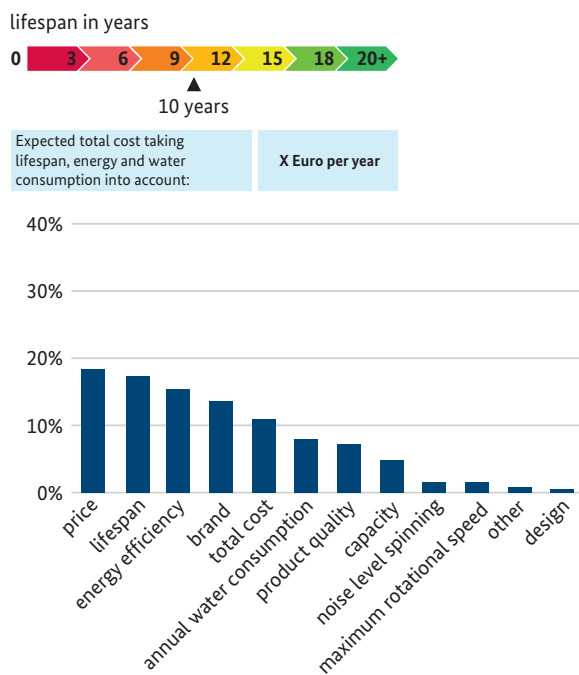


Figure 21: Main decision-making criteria when purchasing a kettle in test group 4

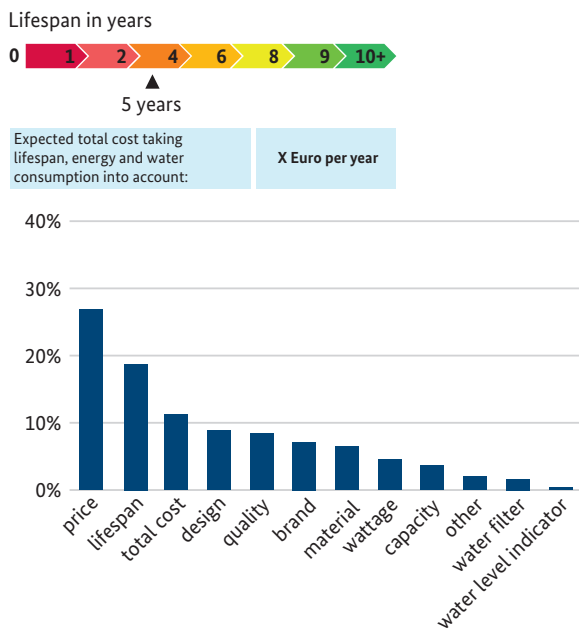
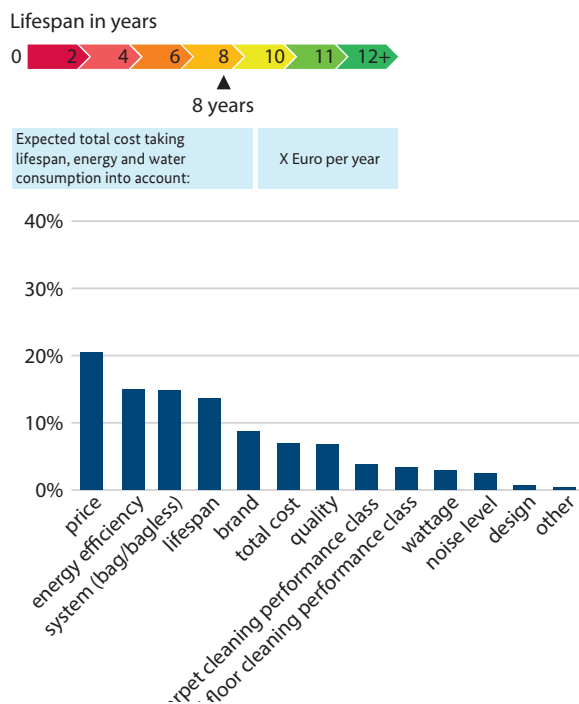


Figure 22: Main decision-making criteria when purchasing a vacuum cleaner in test group 4



The combined indication of the lifespan and average total cost per year for acquisition and operation had a more marked effect on purchasing behaviour than the lifespan alone. It increased the purchase of products in

a higher price-lifespan segment by five percentage points. As a result of combined labelling, the importance of the total costs as a decision-making criterion in the purchasing process increased significantly.

3 Labelling with guarantee label

Test group 5: purchasing decision and decision-making criteria

In test group 5, in which a legally binding guarantee was offered on the lifespan, products with a low price and shorter lifespan were bought more often than in the reference group. However, this effect was not statistically significant ($\chi^2 = 3.25$; $df = 2$; $p > 0.05$).

This finding corresponds to the low importance which the consumers attribute to the guarantee in the purchasing process according to their own account. Depending on the product group, just three to four percent of the consumers gave the guarantee as the most important decision-making criterion (see Figure 24–27).

If you compare the guarantee requirement (test group 5) with the lifespan label requirement (test group 3), the purchasing of products in the top price-lifespan segment is down by three

percentage points for the guarantee requirement. This effect is statistically highly significant ($\chi^2 = 39.77$; $df = 2$; $p < 0.001$). A possible explanation may lie in the fact that the guarantee period is shorter on average than the lifespan. If consumers have learned in the past that the guarantee period is exceeded in most cases by the actual lifespan, then the guarantee is not relevant to them. Another explanation would be that trust in guarantees could have been affected by negative experiences on the market. This potentially has implications for the medium to long-term development of the trustworthiness of a lifespan label. The finding supports the observations from previous research.

A requirement for labelling with a lifespan label has a small effect on the consumption of electrical devices in a higher price-lifespan segment. In comparison with this, a guarantee label was less suited to promoting sustainable consumption.

Figure 23: Difference in purchasing decisions in percentage points lifespan label vs. reference group

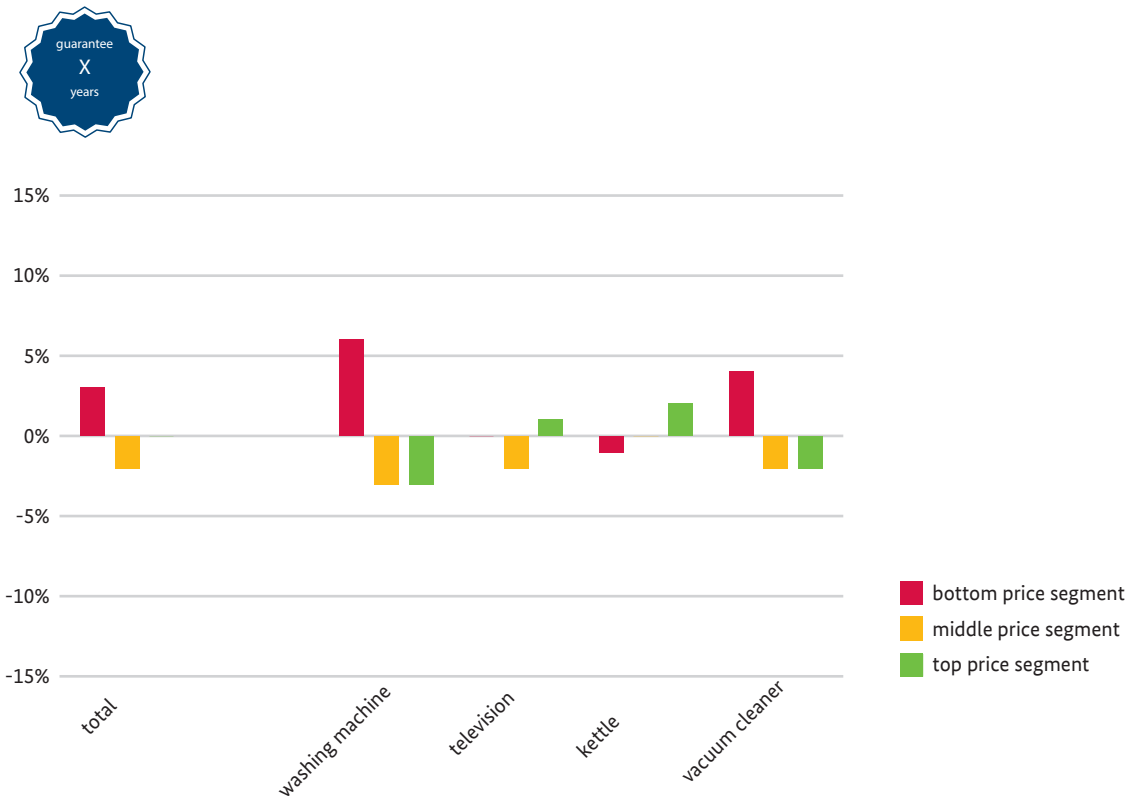


Figure 24: Main decision-making criteria when purchasing a washing machine in the guarantee group

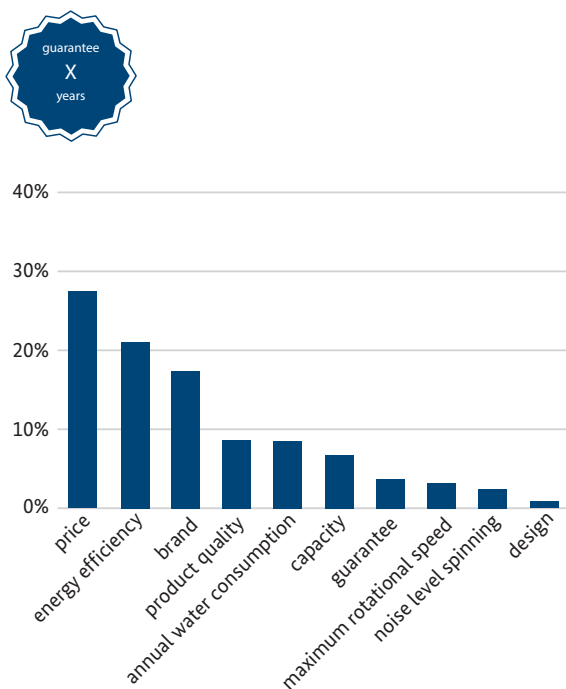


Figure 25: Main decision-making criteria when purchasing a television in the guarantee group

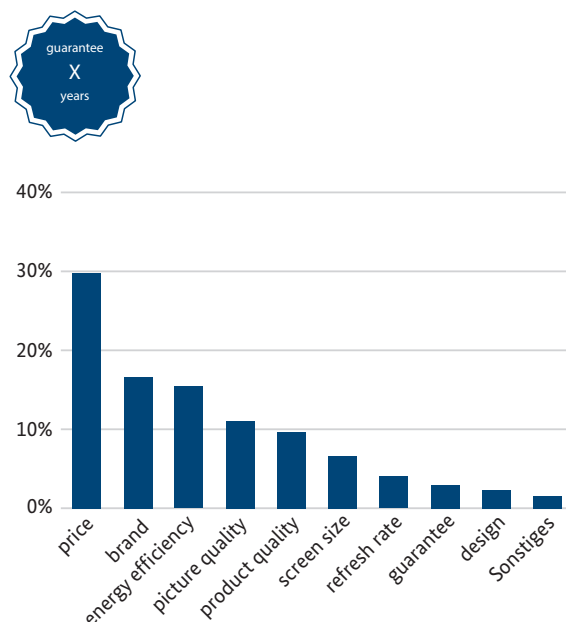


Figure 26: Main decision-making criteria when purchasing a kettle in the guarantee group

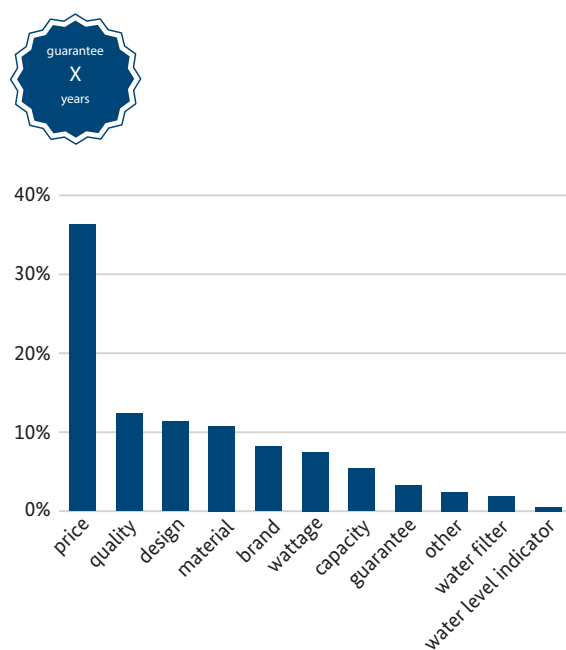
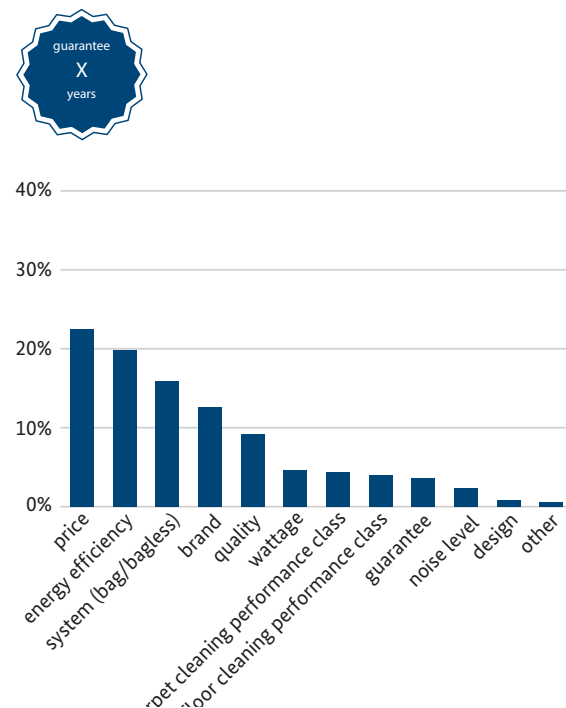


Figure 27: Main decision-making criteria when purchasing a vacuum cleaner in the guarantee group



C. Representative survey for evaluation of the lifespan label

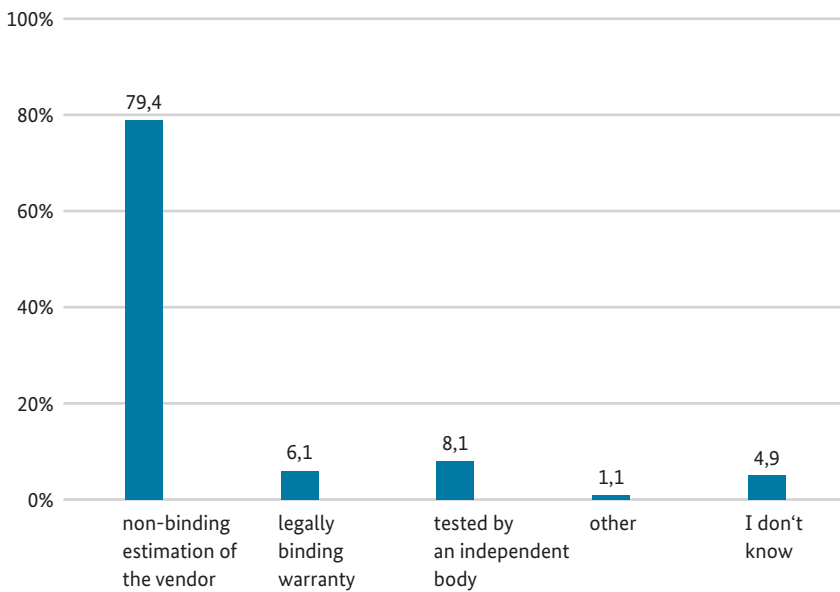
At the end of the purchasing decision simulation, the participating consumers were asked about their understanding, their evaluation and their perception of the lifespan label.

To the question: “While you were shopping, some/all products were furnished with a lifespan label. What exactly did this lifespan label mean for you?”, the consumers answered as follows:

79 percent of the participating consumers understood the information on the lifespan provided by the lifespan label correctly with no further explanation, namely as a non-binding estimation by the manufacturer of the average lifespan of the product. Eight percent assumed that the lifespan indicated would be tested by an independent body. Six percent saw the label as a guarantee (see Figure 28). The lifespan label tested was consequently easy to understand or self-explanatory for most consumers.

Figure 28: Results of the survey

While you were shopping, some/all products were furnished with a lifespan label. What exactly did this lifespan label mean for you?



To the question: “How would you react if you read in the newspaper that manufacturers would be legally required to indicate an estimated, non-binding lifespan for electrical products in the future?”, the consumers surveyed answered as follows: Approximately 43 percent of the respondents would trust the information, around 40 percent had no opinion; conversely 16 percent were somewhat sceptical (see *Figure 29*). Roughly 20 percent said that they would be irritated by the “unnecessary bureaucracy” (see *Figure 30*). 59 percent answered that this information is long overdue (see *Figure 31*). 52 percent would find a function for filtering by the length of the lifespan helpful or very helpful when shopping online (see *Figure 32*). For estimating the extent to which consumers would generally only pay attention to the price, there was no clear trend in the statements (see *Figure 33*).

Figure 29: Results of the survey

I would not trust the information

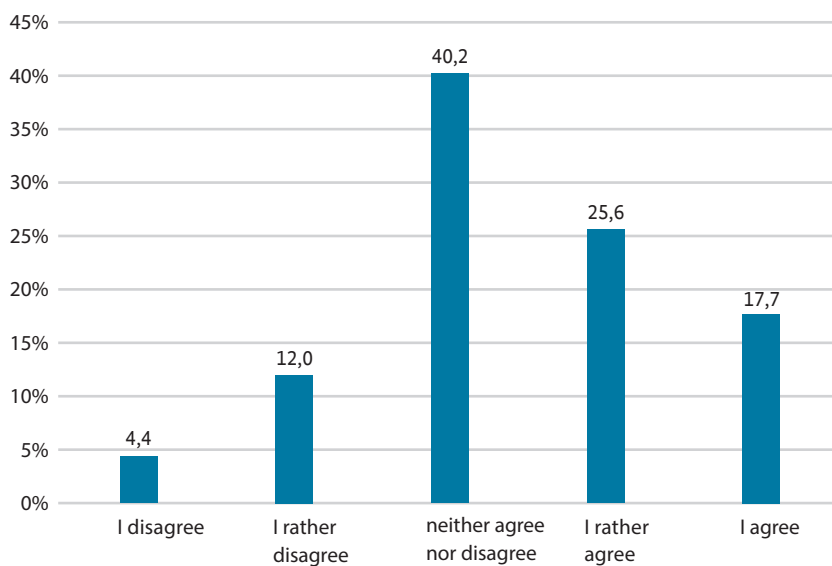


Figure 30: Results of the survey

I would be irritated by the unnecessary bureaucracy

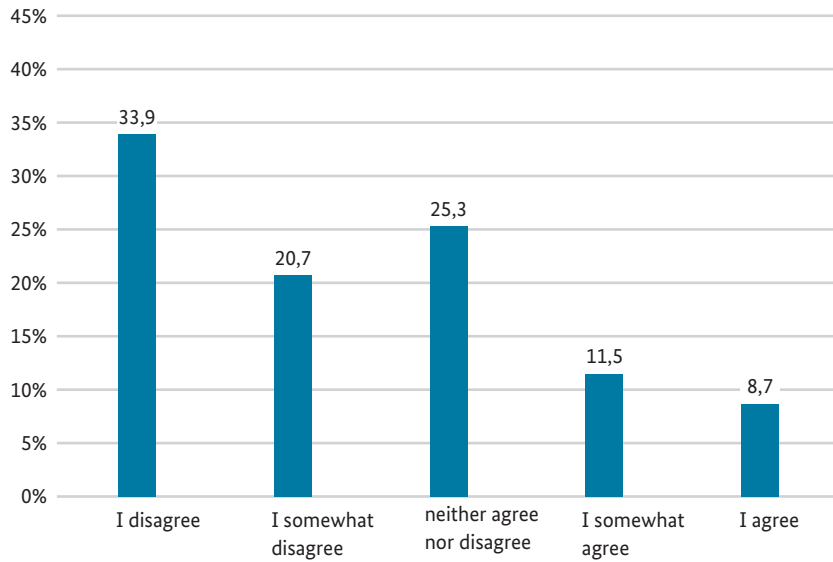


Figure 31: Results of the survey

I would appreciate this information as it is long overdue

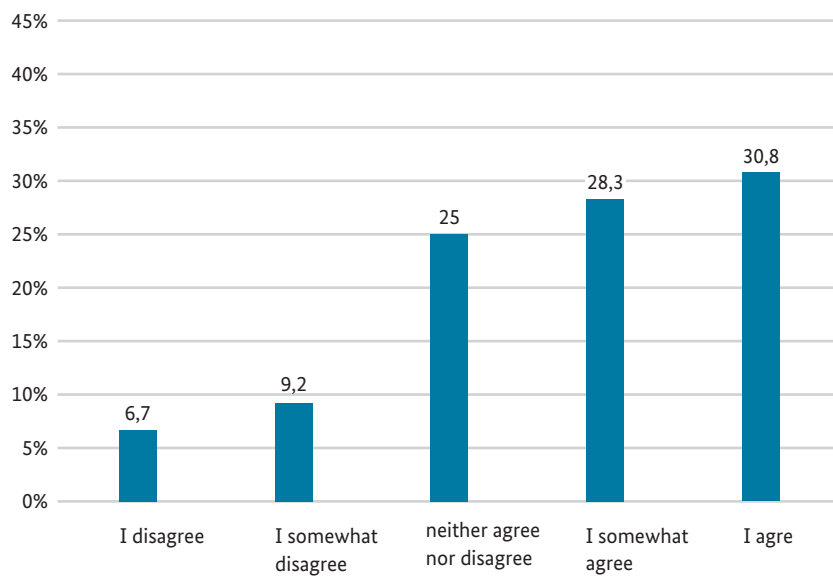


Figure 32: Results of the survey

Imagine that the onlineshop recently introduced the option to sort products not only by common criteria like price or popularity but also by estimated lifespan. How helpful would this option be for you?

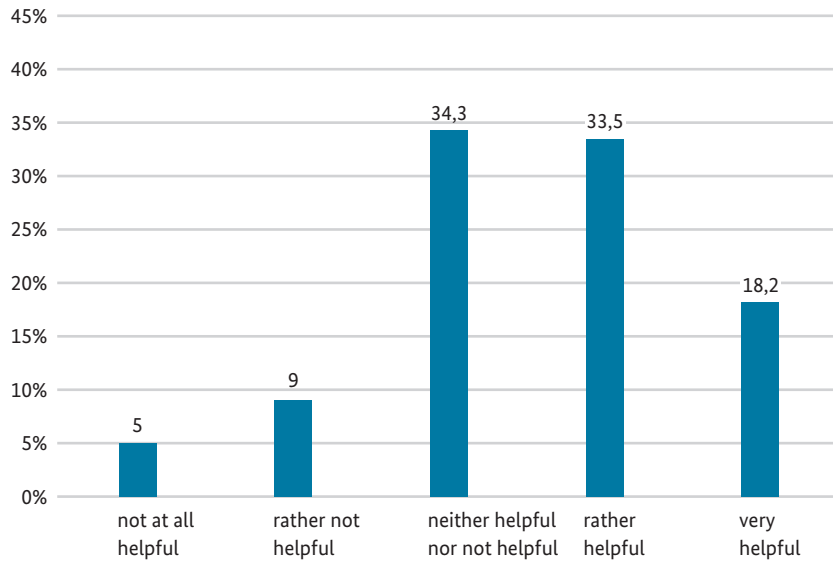
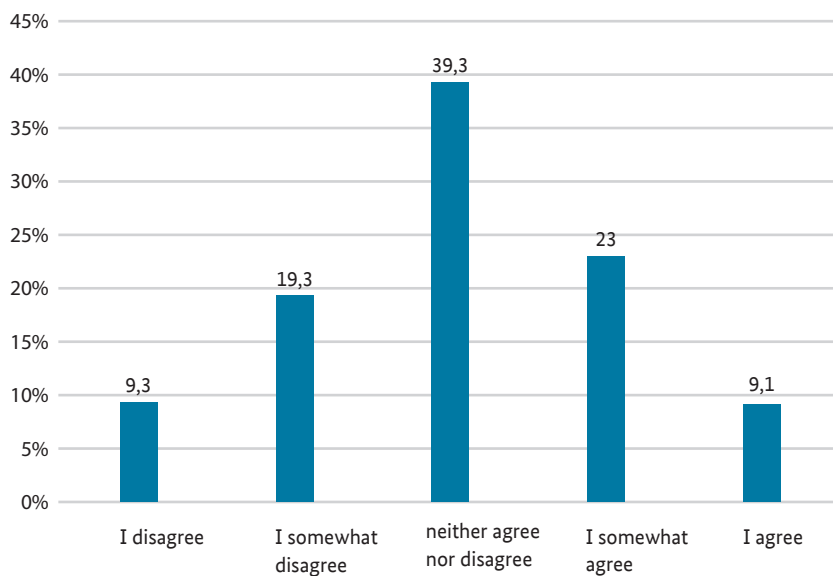


Figure 33: Results of the survey

I would think that consumers generally only pay attention to the price



Limits of the study

The aim of the study was to investigate the effect of a lifespan label and various regulatory alternatives in the most realistic purchasing decision-making situation possible, in which a variety of product features were taken into account. The greatest possible proximity to reality (external validity) in a simulation took priority over the opportunity to investigate some other interesting questions. For example, we refrained from varying the prices for specific products from certain brands in the interest of external validity, even though doing so could have provided additional information about the connection between price and lifespan.

Furthermore, the purchasing decisions in a simulated purchasing situation were hypothetical decisions. Implementation in a real online shop was not possible for legal and practical reasons. The effects of socially desirable response behaviour could not therefore be entirely eliminated, but were kept to a minimum by the design of the study.

Summary of the findings

The findings of the study show: the lifespan label developed is easy to understand and works. However, the effect of the lifespan labels would be limited. The relevance of the lifespan as a decision-making criterion in the purchasing process is significantly increased by a lifespan label. But for most consumers, the price is so important that the lifespan cannot prevail over it. Since a longer lifespan is often accompanied by a higher price, the expected effect of introduction of the lifespan label is low.

The effect of the lifespan label could be increased through the additional provision of information regarding the average total costs per year. Labelling with lifespan label and total costs led to an increase in the purchasing of products in the top price-lifespan segment by five percentage points. It takes the consumers' high awareness of price into account by offering transparency regarding the total cost per year. The embedding of information about the lifespan into a cost consideration makes product comparison easier – similar to the base price regulation, according to which the final price is also indicated in price per unit.

A mandatory guarantee, on the other hand, had no statistically significant effect on consumers' willingness to consider a higher price in the interests of a longer lifespan.

Endnotes

- ¹ Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (2015). Used electrical and electronic devices. URL: <http://www.bmub.bund.de/themen/wasser-abfall-boden/abfallwirtschaft/abfallarten-abfallstrome/elektro-und-elektronik-altgeraete/> (last downloaded on 08/06/2017).
- ² Cooper, T. (2004). Inadequate life? Evidence of consumer attitudes to product obsolescence. *Journal of Consumer Policy*, 27, 421–449.
- ³ Findings of a European study with 2917 participants from France, Spain, Benelux and the Czech Republic suggest that a product with a longer lifespan at the same price would be purchased more often than products with a shorter lifespan (Université de Bretagne Sud, SIRCOME, Université de Bohème du Sud, 2016). In a study by the Öko-Institut with 2000 German consumers, the participants were willing to pay an additional cost for a longer lifespan. For example, the consumers declared their willingness to pay 97 Euros more on a notebook priced at 349 Euros if the lifespan was six years instead of three. This would be the equivalent of nine percent of the product price per additional year (Prakash et al., 2016, p. 351).
- ⁴ Banerjee, A., & Solomon, B. (2003) Eco-labeling for energy efficiency and sustainability: a meta-evaluation of US programs. *Energy Policy*, 31, 109–123.
- ⁵ The price segmentation selected by the Federal Ministry for the Environment, Nature Conservation, Construction and Nuclear Safety & Federal Environment Agency is based on guidelines from Stiftung Warentest.
- ⁶ Hennies, L., & Stamminger, R. (2016). An empirical survey on the obsolescence of appliances in German households. *Resources, Conservation and Recycling*, 112, 73–82.
- ⁷ Prakash, S., Stamminger, R., Dehoust, G., Gsell, M., Schleicher, T., Gensch, C.-O., Graulich, K., Antony, F., Köhler, A., & Hilbert, I. (2016). Einfluss der Nutzungsdauer von Produkten auf ihre Umweltwirkung: Schaffung einer Informationsgrundlage und Entwicklung von Strategien gegen „Obsoleszenz“. Research report on behalf of the Federal Environment Agency, research identification number (UFOPLAN) 3713 32 315, P. 103ff.
- ⁸ Université de Bretagne Sud, SIRCOME, & Université de Bohème du Sud (2016). The Influence of Lifespan Labelling on Consumers Study as part of the invitation to tender “Study on the possible effects of the provision of product lifespan information on consumer behaviour” by the European Economic and Social Committee (ref. CES/CSS/1/2015).
- ⁹ EU directive 2010/30/EU. Here, 220 standard wash cycles with a mix of 60 and 40 degree washes and full and partial loads is assumed. For an overview of the regulations for numerous other devices, see: http://ec.europa.eu/energy/sites/ener/files/documents/list_of_enegey_labelling_measures.pdf
- ¹⁰ Schlacke, S., Alt, M., Tonner, K., Gawel, E., & Bretschneider, W. (2015). Stärkung eines nachhaltigen Konsums im Bereich Produktnutzung durch Anpassungen im Zivil- und öffentlichen Recht. On behalf of the Federal Environment Agency. Text 72/2015. Dessau-Roßlau, <http://www.umweltbundesamt.de/publikationen/staerkung-eines-nachhaltigen-konsums-im-bereich>
- ¹¹ Prakash et al. (2016), P.312 ff..
- ¹² <http://www.bundesregierung.de/Content/DE/StatischeSeiten/Breg/wirksam-regieren/Anlagen/Download-Produktlabel-Lebensdauer.html>
- ¹³ Prakash et al. (2016), Université de Bretagne Sud, SIRCOME, & Université de Bohème du Sud (2016).
- ¹⁴ Hennies, L., & Stamminger, R. (2016).

List of figures

Fig. 1:	Screen showing the simulated online shop	9	Fig. 26:	Main decision-making criteria when purchasing a kettle in the guarantee group	29
Fig. 2:	Screen showing product details	10	Fig. 27:	Main decision-making criteria when purchasing a vacuum cleaner in the guarantee group	29
Fig. 3:	Lifespan label	12	Fig. 28:	Results of the survey	30
Fig. 4:	Lifespan label and total costs per year	13	Fig. 29:	Results of the survey	31
Fig. 5:	Guarantee label	13	Fig. 30:	Results of the survey	32
Fig. 6:	Purchasing decisions in the reference group by product group	16	Fig. 31:	Results of the survey	32
Fig. 7:	Main decision-making criteria when purchasing a washing machine in the reference group	17	Fig. 32:	Results of the survey	33
Fig. 8:	Main decision-making criteria when purchasing a television in the reference group	17	Fig. 33:	Results of the survey	33
Fig. 9:	Main decision-making criteria when purchasing a kettle in the reference group	18			
Fig. 10:	Main decision-making criteria when purchasing a vacuum cleaner in the reference group	18			
Fig. 11:	Purchasing decisions – mandatory lifespan label	22			
Fig. 12:	Difference in purchasing decisions in percentage points – lifespan label vs. reference group	23			
Fig. 13:	Main decision-making criteria when purchasing a washing machine in test group 3	24			
Fig. 14:	Main decision-making criteria when purchasing a television in test group 3	24			
Fig. 15:	Main decision-making criteria when purchasing a kettle in test group 3	24			
Fig. 16:	Main decision-making criteria when purchasing a vacuum cleaner in test group 3	24			
Fig. 17:	Purchasing decisions – lifespan label and total costs per year	25			
Fig. 18:	Difference in purchasing decisions in percentage points lifespan label and total costs vs. reference group	26			
Fig. 19:	Main decision-making criteria when purchasing a washing machine in test group 4	27			
Fig. 20:	Main decision-making criteria when purchasing a television in test group 4	27			
Fig. 21:	Main decision-making criteria when purchasing a kettle in test group 4	27			
Fig. 22:	Main decision-making criteria when purchasing a vacuum cleaner in test group 4	27			
Fig. 23:	Difference in purchasing decisions in percentage points guarantee label vs. reference group	28			
Fig. 24:	Main decision-making criteria when purchasing a washing machine in the guarantee group	29			
Fig. 25:	Main decision-making criteria when purchasing a television in the guarantee group	29			

List of tables

Tab. 1:	Overview of reference group and test groups	14
Tab. 2:	Distribution of purchasing decisions per product with various lifespans and the same price – bottom price segment	19
Tab. 3:	Distribution of purchasing decisions per product with various lifespans and the same price – middle price segment	19
Tab. 4:	Distribution of purchasing decisions per product with various lifespans and the same price – top price segment	19

With citizens for citizens – *wirksam regieren* government strategy and project group

“We want to increase the delivery and effectiveness of political projects by developing projects more strongly from the point of view of and with participation from citizens.”

Source: coalition agreement between CDU, CSU and SPD in December 2013

The Federal Government has followed through on this goal from the coalition agreement in December 2013. The project group “*wirksam regieren*” (citizen-centred government) in the Federal Chancellery has been supporting ministries and other government agencies since 2015 in getting citizens involved in the design and continuous improvement of specific projects.

Whether law or administrative rule, administrative process or a simple form – the state has a wide variety of options for organising society and pursuing political goals. For each of these cases, these questions need to be answered: what is the optimal design and how should the implementation look like for achieving the political goal in question?

For selected political projects, *wirksam regieren* tests alternative options for design and implementation. This is done very practically, under realistic conditions, and in dialogue with citizens.

Approach: understanding – designing – testing – evaluating

Understanding.

The first step of each project is to understand the situation and the viewpoint of all stakeholders.

To this end, and depending on the details of the project, input is collected from citizens, consumers or users on questions such as: do the affected parties benefit in the intended manner from a proposed policy? How do citizens experience public services and where do they see potential for improvement? Are forms, applications and legal language easy to understand and clear? Is the information provided to

consumers helpful? *Wirksam regieren* works interdisciplinarily and builds on the latest findings of the empirical social sciences. For example, behavioural and decision sciences provide insights into how people deal with information or perceive processes.

Designing.

In a second step, design alternatives for a proposed policy are developed from these results.

Wherever appropriate, citizens are involved in this process of developing design alternatives. Citizens’ experiences and viewpoints are thus taken into account.

Testing.

The various design options are empirically tested with a view to their actual effect, user-friendliness or clarity. Issues can be identified early on to optimize delivery and implementation.

Evaluating.

Ministries or authorities define the research question and the project scope. *Wirksam regieren* formulates and implements the research design, collects data and evaluates it.

The results become part of the political process and decision-making in the ministries and government agencies.

The benefits of this approach: the effectiveness of political projects can be optimised from the citizens’ point of view: laws and programmes become more targeted. Information is made clearer. Forms, processes and legal language become simpler. Unnecessary bureaucracy is avoided and taxpayers’ money is saved.

By incorporating scientific expertise along with citizens’ ideas and viewpoints better solutions for an effective policy making process can be achieved.

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www.bundesregierung.de/wirksam-regieren

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<http://www.bundesregierung.de/Content/DE/StatischeSeiten/Breg/wirksam-regieren/Anlagen/Download-Produktlabel-Lebensdauer.html>

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