

Study on the impact of the energy label – and potential changes to it – on consumer understanding and on purchase decisions

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Contents

Page

1	Introduction	1
1.1	Objectives of the study	1
1.2	Methodology	1
2	Phase 1 Preparatory phase – targeted literature review	2
2.1	Numeric versus alphabetic scales	2
2.2	Benchmark markers	4
2.3	Continuous scales	4
2.4	Preparatory phase conclusions	5
3	Consumer understanding and decision making	6
3.1	Products	6
3.2	Label frames	6
3.3	Product energy ratings	8
3.4	Experiment design	8
4	Understanding of the different energy label framings	21
4.1	Ability to identify the most energy efficient product	22
4.2	Understanding of specific elements of different energy label framings	23
5	Impact of different energy label framings on consumer behaviour	25
5.1	Experiment analysis methodology	25
5.2	Impact of different energy label framings on consumer bidding behaviour	26
5.3	Impact of different energy label framings on consumer purchasing behaviour	29
6	Conclusions and recommendations	39
6.1	Recommendations for next testing phase	44
	References	45
Annex 1	Socio-demographics	46
Annex 2	Previous purchasing behaviour and experience of energy labels	48
Annex 3	Questionnaire and experiment code	53

Tables, Figures and Boxes

Page

Tables

Table 1:	Sample sizes	6
Table 3:	Energy efficiency label pair combinations	13
Table 4:	Price levels used in the choice experiment	14
Table 5:	Bidding experiment energy efficiency ratings	17
Table 6:	Redemption values used in the bidding exercise	17
Table 7:	Average bids in BDM bidding experiment under each energy label framings (€)	27
Table 8:	Difference in mean bids for 'good' and 'bad' products across each energy label framing (€)	27
Table 9:	Difference in the mean additional amount participants are willing to bid for 'good' rather than 'bad' products across energy label framings (€)	29
Table 10:	Differential between the average additional amount participants are willing to pay for a more energy efficient product depending on the energy efficiency rating difference	38

Figures

Figure 1:	Behavioural experiment label frames	7
Figure 2:	Behavioural experiment information screens	10
Figure 3:	Example of on-screen presentation for choice experiment	15
Figure 4:	Example screen from the bidding exercise	16
Figure 5:	Example understanding question	18
Figure 6:	Understanding test numeric open scale	19
Figure 7:	Please use sentence case	20
Figure 8:	Share of participants that could correctly identify the most energy efficient product when faced with different energy label framings	23
Figure 9:	Share of participants that could correctly identify the meaning of specific features of different energy label framings	24
Figure 10:	Share of participants willing to pay a premium for the more energy efficient product across the different energy label framings	31
Figure 11:	Share of participants willing to pay a higher price for more energy efficient products as the premium increased	34
Figure 12:	Average minimum premium participants are willing to pay for a more energy efficient product , by energy efficiency rating difference	37
Figure 13:	Label frames used in the experiment	40
Figure 13:	Age	46
Figure 14:	Gender	46
Figure 15:	Working status	47
Figure 16:	Q1A. Before this survey had you ever seen the following type of label [current EU energy label] on washing machines?	48
Figure 17:	Q1B. Before this survey had you ever seen the following type of label [current EU energy label] on televisions?	49
Figure 18:	Q1C. Before this survey had you ever seen the following type of label [current EU energy label] on light bulbs?	49

Tables, Figures and Boxes

Page

Figure 19: Q1ABC. Proportion fo respondents whi had seen the current Eu energy label label on any of the three products	50
Figure 20: Q2. Which of the following products have you bought in the last 24 months?	50
Figure 21: Q3. When buying the following product(s), which of the following did you take into consideration?	51
Figure 22: Q4. And which of the following was the most important when buying the following product(s)?	52
Figure 23: Q5. You said you took energy efficiency into account when buying your household appliance(s). What was the main reason you considered energy efficiency?	52

1 Introduction

1.1 Objectives of the study

This study provides an assessment of alternative energy label designs. The study explores consumers' understanding of the individual elements of the energy label and how the label design influences consumer purchase decisions. To this end, the study implemented **online behavioural experiments in seven Member States** to measure cognitive and behavioural responses to various label elements. In addition a **bricks-and mortar experiment in four Member States will be conducted in May 2014**.

Based on this, the study explores consumer understanding of the following aspects of energy labels:

- The use of letters versus numbers for the main element of the label;
- The use of an open-ended versus a closed-ended scale;
- Effectiveness of including an the indication of where the best available technology of a certain year is; and
- The use of an increasing or decreasing numeric scale.

The study will provide recommendations of the most effective label elements, as well as suggest possible improvements. This interim report provides recommendations from the online behavioural experiment for subsequent label testing in the bricks-and-mortar experiment.

1.2 Methodology

There are three phases to this study:

- Phase 1 is a targeted literature review. The objective was to review existing knowledge on consumer behaviour and understanding under alternative energy labelling frames. The review is limited to those frames under consideration for the behavioural experiment.
- Phase 2 is an online behavioural experiment in 7 Member States,
- Phase 3 is a bricks-and-mortar experiment to be carried out at retail stores in three Member States, Belgium, France and the United Kingdom; and, in the Czech Republic the experiment will be implemented in a retail lab located within a large retail supermarket in a shopping mall. Phase 3 is expected to be implemented in May 2014.

2 Phase 1 Preparatory phase – targeted literature review

The first task in the consumer research was to undertake a targeted review of the existing literature on consumer behaviour under alternative energy labelling frames.

The preparatory phase considered four alternative frames. These frames are:

- Alphabetical scale
- Numerical scale
- The use of a benchmark marker
- Continuous scale

2.1 Numeric versus alphabetic scales

This section reviews previous findings on how consumers' understanding of energy efficiency labels compares between labels using alphabetic ordinal scales and those using numeric ordinal scales, and what impact the two alternative scales have on behaviour.

Alphabetic Scales

Alphabetical scales are one of the most widely-used categorical scales to describe energy efficiency. Most countries where an alphabetical scale has been implemented adopted a design that is very similar to the EU energy label (Buy Smart +, 2012). There is strong evidence from multiple studies that alphabetical scales are widely understood and interpreted correctly by consumers and help them to effectively compare the energy efficiency of different products.

In China, for instance, a study conducted by the China National Institute for Standardisation found that labels which used a letter scale were the most comprehensive for consumers. 100% of the study respondents interpreted the scale correctly (Egan & Waide, 2005).

'A-G' Scale

The alphabetical scale adopted in the EU has evolved over time from an 'A-G' scale to an 'A+' scale to reflect the efficiency improvements of the market as a whole.

Studies in the UK and across the EU have found that the 'A-G' scale is correctly understood by between 70 and 80 per cent of consumers (Consumer Focus, 2012; Heinzle & Wuestenhagen, 2009). The grading information was easily found by the majority of consumers who reported that their behaviour was influenced by the label (Consumer Focus, 2012).

The effectiveness of the 'A-G' label scale on consumers' decision making when purchasing white goods was also high, with most people being influenced by the energy rating (Heinzle & Wuestenhagen, 2009), and the rating was almost as important in the decision making process as product price (Consumer Focus 2012). Only 11 per cent of respondents in the Consumer Focus study reported that they did not use the efficiency rating because they were not concerned about energy savings. Additionally, study participants were more often influenced by the A-G efficiency

rating than by operating costs (Consumer Focus, 2012). Hence, the 'A-G' energy labels performed highly both in terms of understanding and influence on purchasing behaviour.

'A+' Scale

Studies that have compared understanding and effectiveness of an 'A-G' scale and an 'A+++' provide mixed results. In the study by Consumer Focus (2012), consumers preferred the A-G scale over the 'A+' scale. Only 50% of consumers surveyed understood the 'A+' scale correctly compared to 70% that correctly understood the A-G scale. In contrast, Waide and Whatson (2013) did not find a statistically significant difference in consumer understanding between an 'A-G' and an 'A+++D' scale. Further, they found no evidence of confusion when using an 'A+-F' scale, either. However, the sample size was relatively small – 95 participants took part in the focus groups. Hence, a larger sample would be necessary to verify this result.

Waide and Watson (2013) also assessed consumers' willingness-to-pay for more energy efficient products using an 'A+++D' scale. They found that on average, survey respondents were willing to pay €40 more for every higher label class refrigerator-freezer. Further, respondents were willing to pay 44% more for an A+++ than for an A-grade product. In the case of televisions, participants were willing to pay €50 more on average for an additional label class, and 50% more for an A-grade TV-set compared to a G-grade one on the 'A-G' scale. In comparison, Heinze and Wuestenhagen (2010) find higher marginal increases in willingness to pay, but in a different set-up.

The importance of the energy rating for consumers' purchasing decisions has been found to be lower when an 'A+' scale was used as opposed to an 'A-G' scale. Heinze & Wuestenhagen (2009) found that the importance given to the energy rating decreased by 10% when the A+ scale was used. Under the 'A+' framing, consumers attached higher importance to price. As Heinze and Wuestenhagen (2011) show in their conjoint analysis, the 'A-G' scale has a greater impact on purchasing behaviour and more consumers were willing to pay a larger premium for the highest classes on the 'A-G' scale than on the 'A+' scale.

Numeric Scale

Numeric closed scales are also widely used on energy labels. Countries including China, Tunisia and Korea use numeric ordinal scales. In China and Korea the scale is between 1 and 5, and in Tunisia it is between 1 and 8. Research from China and Tunisia shows that consumers generally understand these scales (Egan & Waide, 2005). However, the numeric scale was less understandable than the alphabetic one in the studies conducted in China. This issue was addressed by the designers adding a character for "class" next to the number.

In conclusion, identified studies drawing on experience from different countries suggest that both alphabetic and numeric closed ordinal scales are well understood by consumers and effectively influence their purchasing decisions. The evidence in favour of the alphabetical scale is slightly stronger (Egan & Waide, 2005). In addition an A-G scale is both less confusing and more effective than an 'A+' scale.

2.2 Benchmark markers

The only countries, to our knowledge, that have so far adopted a form of benchmarking in their energy label are the USA and Canada. They use a closed scale that indicates the cost or energy units of both the lowest and highest energy spending relevant products on the market. A marker positions the labelled appliance in the range with its cost or energy consumption units.

When evaluating the US labelling program, Egan (2000a) used a combination of focus groups, interviews and surveys. The study assessed, amongst others, how consumers used the comparative feature of the label. It was found that participants could rarely understand and use the benchmarks of best and worst-performing comparable devices. Instead, they mostly used the individual model information depicted on the label. As a result, interviewees often did not realise that the model was inefficient relative to other models. In other cases, participants requested external comparison, i.e. to physically check the labels of other models and compare the individual characteristics. The problem was more pronounced with the continuous scale than any other scales evaluated, such as stars, thermometer and speedometer.

The US Environmental Protection Agency (2010) conducted a study to inform the design of a fuel economy label on vehicles. Participants in the focus group phases responded well to labels with a comparative element, and recommended the use of clear words for benchmark markers such as “best” and “worst”.

Currently existing literature does not provide much information on the impact of a benchmark marker on EU consumers’ understanding and purchasing behaviour.

2.3 Continuous scales

While the experimental phase of this study does not specifically include a continuous scale frame, the preparatory phase did include these labels. In this sub-section we therefore discuss consumer understanding and behaviour under these labelling types.

Continuous scales are currently used in the USA and Canada in contrast to the EU, Australia, and Brazil where various categorical scales are used (as discussed above).

In the US Labelling Program Evaluation, Egan (2000a, 2000b) concluded that the categorical scales that were tested were better understood by participants than the continuous scale. This evidence is supported by market research in India conducted by the Bureau of Energy Efficiency (Dethman et al 2000). Study respondents perceived both horizontal continuous and categorical scales well. However, categorical scales performed better than the continuous scales when testing consumers’ comprehension in a side-by-side comparison of labels.

The Fuel Economy Label Study (2010) provides contrasting evidence. The most favoured label design by the focus groups used a horizontal continuous scale, bound by markers for best and worst-performing vehicles. Some study participants noted that a categorical scale, such as a 5-star scale, does not provide sufficient information about fuel efficiency positioning to inform vehicle choice.

To the best of our knowledge, vertical continuous colour-coded scales have not yet been tested for consumer understanding and response.

2.4 Preparatory phase conclusions

The existing literature on alternative energy labelling frames and their impact on consumer decision making and understanding appears limited. However, there are some findings that emerge. Namely, alphabetical scales are generally well understood by consumers and lead to a higher willingness to pay for more energy efficient products. Numerical scales are also understood by consumers, but there is some evidence that consumers do not understand numerical scales as well as alphabetical scales. Benchmarking best available technology does not appear to be widespread, and where it does exist, some confusion can arise as to its meaning. Where benchmarks are used clear explanation of their meaning on the label is recommended. Continuous scales are generally not as well understood by consumers compared to categorical scales.

3 Consumer understanding and decision making

The online behavioural experiment was implemented in 7 Member States to assess how the alternative label frames impact upon consumer purchasing decisions and understanding. The Member States were the Czech Republic, France, Italy, Norway, Poland, Romania and the United Kingdom. In total 5012 consumers participated in the behavioural experiment. Table 1 presents the sample sizes for each country.

Country	Sample size
Czech Republic	500
France	1007
Italy	1000
Norway	503
Poland	500
Romania	501
United Kingdom	1001

3.1 Products

Three products were used in the experiment: Televisions, washing machines and light bulbs.

These products are present in the majority of households across the EU and vary in several characteristics including the frequency with which consumers purchase them, their price levels and whether the products are luxuries/necessities.

This enables us to identify whether different energy label designs have similar impacts across products that have varying characteristics, or whether different energy label designs appear to be more suitable for certain products.

Product specific characteristics of each product were displayed on the labels within the experiment. These characteristics remained constant for each product throughout the experiment to ensure that the focus of the study was on the impact of different designs of energy labels on consumer behaviour and understanding. This is to ensure that any observed differences in consumer behaviour across the different energy label frames can be attributed to changes in the label design and not other product specific characteristics.

The product specific characteristics were the following:

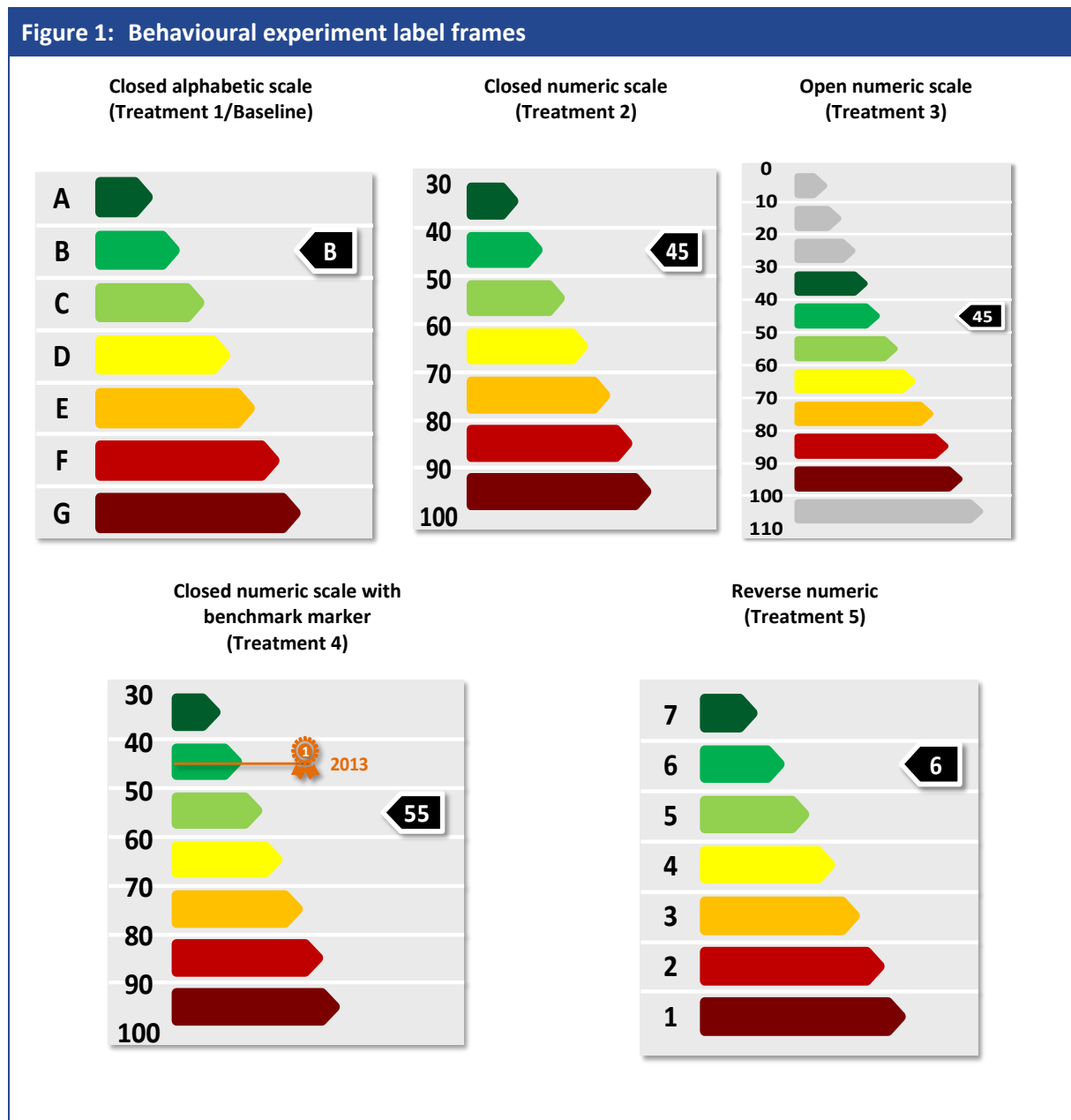
- Televisions: screen size 32 inches, full high definition LED.
- Washing machines: Spin speed 1400rpm, 7kg wash load.
- Light bulb: Energy saving halogen, lifetime 2000 hours.

3.2 Label frames

Five label frames were tested in the experiment. These were:

- closed alphabetic scale (Treatment 1 and the baseline treatment);
- closed numeric scale (Treatment 2);
- open numeric scale (Treatment 3);
- closed numeric scale with a benchmark marker showing current best available technology (Treatment 4); and,
- closed ended reversed numeric scale (treatment 5).

Figure 1 presents these five frames/treatments.



Source: London Economics/Ipsos behavioural experiment

The closed alphabetic scale is used as the baseline treatment in the experiment. The arrow shown alongside the scale shows the energy rating of the product affixed with the label. Treatment 2 is the closed numeric scale. Comparing between the baseline and Treatment 2 allows us to investigate the impact of moving from alphabetical to numerical scaling on consumer behaviour and understating. Treatment 3 is the open numeric scale. Comparison between this treatment and Treatment 2 allows us to isolate the effect of moving from a closed ended to an opened scale. Treatment 4 is a closed numeric scale with a marker indicating the best available technology in the current year. Comparison between Treatment 2 and Treatment 4 allows us to assess the effect of introducing a best available technology comparison on the label. Treatment 5 is the reverse numeric scale. This treatment allows us to explore the impact of using higher numbers to represent more energy efficient products.

3.3 Product energy ratings

The product energy ratings were selected based on previous research for the European Commission¹, and in consultation with EC DG Energy.

In order to map ratings that currently exist on the market to the frames tested in the experiment we did the following:

- Washing machine took the ratings B to E in the experiment. This meant that rating A+++ became an A rating. Based on previous research for the EC, washing machines on the market currently have a maximum rating of A++ as such we set the highest rating for washing machines at B in the experiment.
- Televisions took the ratings A to D. A++ became an A rating in the experiment. Based on previous research for the EC, currently washing machines on the market have a highest rating of A++, therefore we set the highest rating in the experiment at A for washing machines.
- There was no information on the market ratings for light bulbs. Therefore, based on a targeted websweep for halogen light bulbs and in discussion with EC DG Energy, we elected to set light bulbs between B and E. We assumed the best available light bulb on the market is a B. This is based on a finding that C class halogen bulbs are easily available, and that B class will soon be available (or are currently available in limited cases).

For treatments 2 to 5, we transposed the alphabetic ratings to numeric ratings in consultation with EC DG Energy. Namely, a B (treatment 1) became 45 (treatment 2 and 3) or 6 (treatment 5).

3.4 Experiment design

The experiment was made up of five parts:

- A. Information stage

¹ ENER/C3/2101-523, September 2013.

- B. Choice experiment
- C. Bidding exercise
- D. An interpretation test
- E. Questionnaire

The order in which the respondents completed the choice experiment and bidding exercise was randomised such that half completed the BDM first and half completed the choice experiment first. All participants completed the questionnaire and the interpretation test last.

Participants were divided into five equal treatment groups, one for each of the different label frame treatments. The allocation to each group was random with 20% allocated to each. This corresponds to 100 and 200 respondents from small and large countries, respectively, in each group. Participants remained in the same treatment group throughout the whole behavioural experiment.

3.4.1 Information stage

Before starting the experiment tasks all participants received an information screen that explained the main features of the energy labels. Respondents were presented with the information screen for their specific treatment group, and were required to remain on this screen for at least 30 seconds before moving on. **Error! Reference source not found.** shows the information screens using washing machines as the example product.

Figure 2: Behavioural experiment information screens

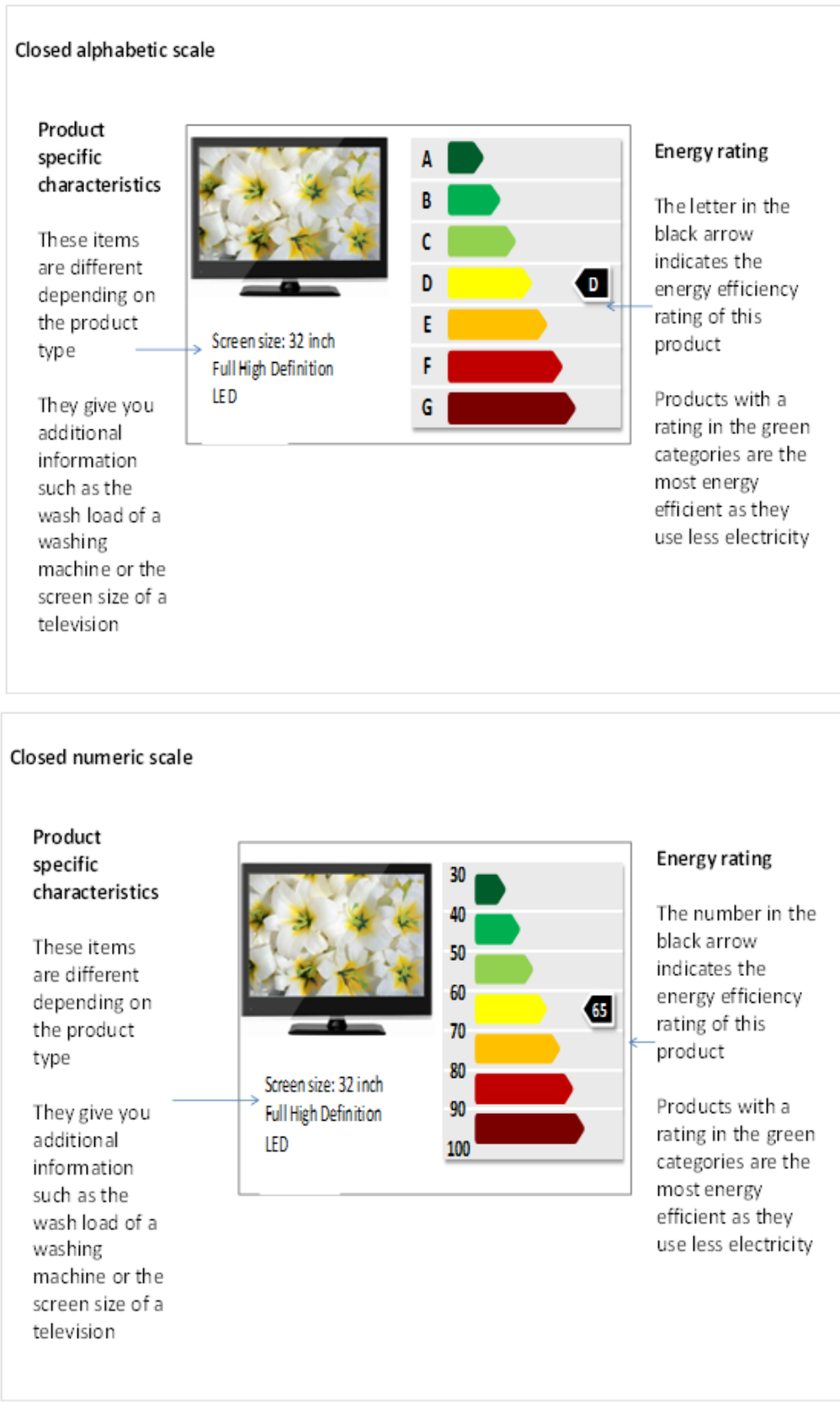


Figure 2: Behavioural experiment information screens

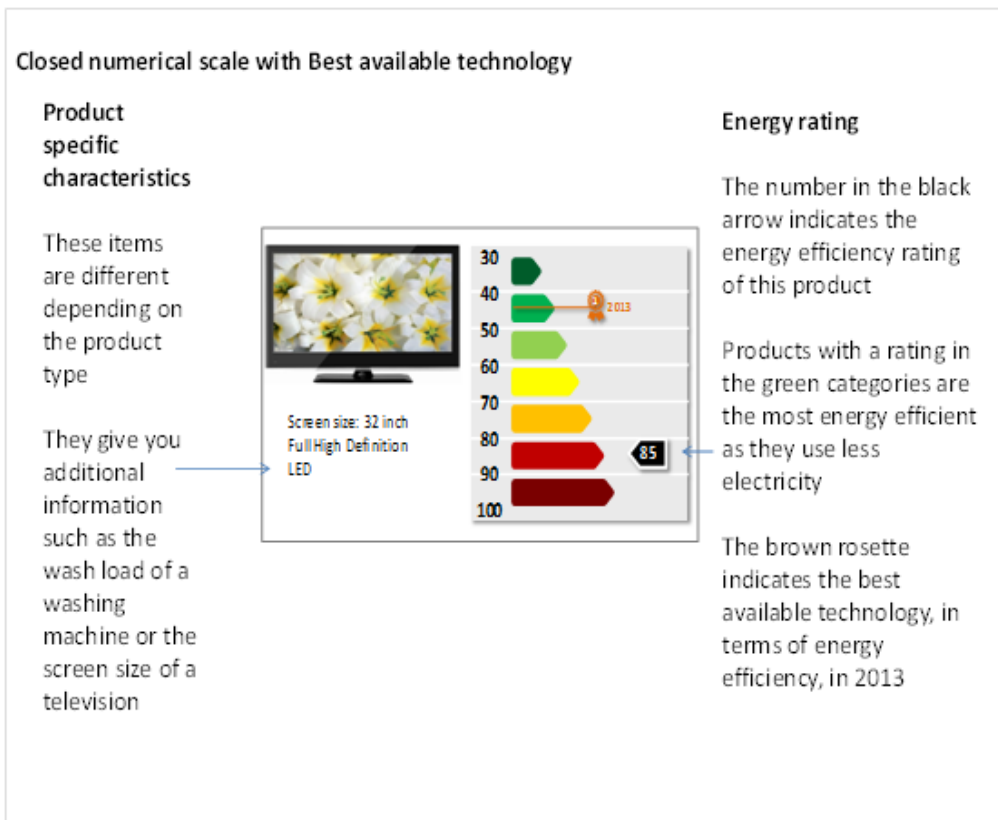
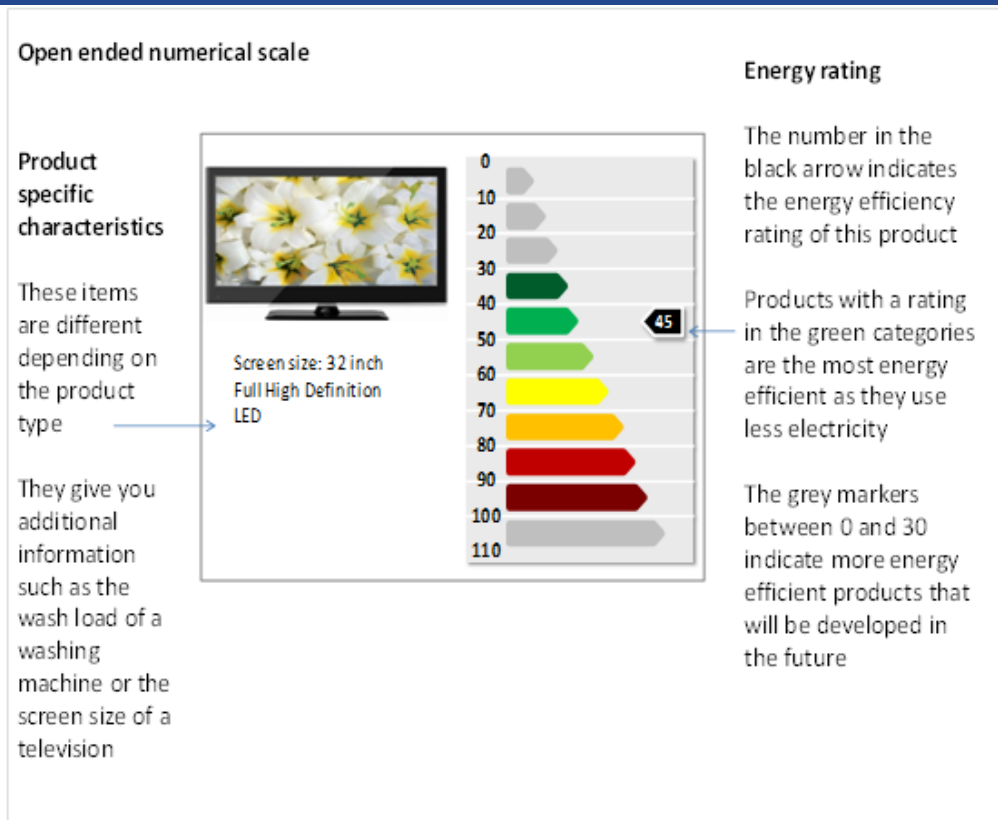
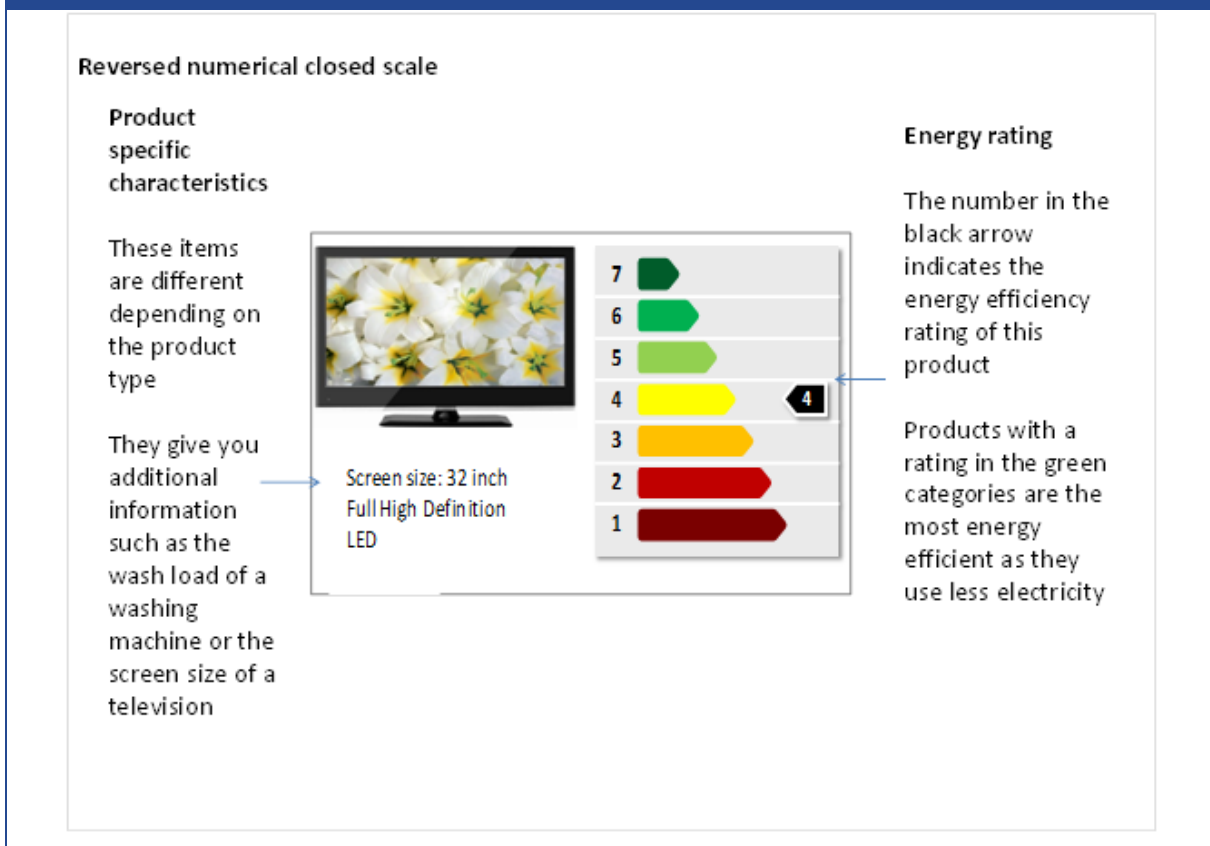


Figure 2: Behavioural experiment information screens



3.4.2 Choice experiment

The aim of the choice experiment was to isolate the impact of energy rating on consumers' product choices when these ratings are presented in the baseline frame (Treatment 1), and via specific possible variants of the current label (Treatments 2 to 5).

How the choice experiment worked

Respondents were informed that:

1. They were going to be asked to make choices between the hypothetical products washing machines, televisions and light bulbs.
2. The products would have different energy efficiency ratings and different prices, which would vary across the choices offered to them.
3. The price of each option was the hypothetical one-off cost to them of purchasing the product. In this experiment they did not earn any points.
4. They should suppose that they were in the market for these products and, although the choices were hypothetical, they should respond based on their preferences as if the choices were real.
5. They would be asked to make nine choices in total.

For each product type, respondents from each group made three choices (i.e. nine choices in total) between products carrying the particular label design assigned to that group. Respondents in each group were asked to choose between specific pairs of products with differing energy efficiency levels.

Each of the energy efficiency label designs is a seven point scale, which means that in each treatment there are 21 different energy efficiency combinations. Multiplying this across each of the five different treatments and three different products means that there are 315 different combinations of energy efficiency. The sample sizes associated with each of these different combinations would have been very small, if we had included all of these different energy efficiency combinations in the choice experiment.

The vast majority of recent sales for each of these three products were in only four different energy efficiency levels.² Therefore we included four different energy efficiency levels for each of the different products in the choice experiment. There were a total of 90 different combinations of energy efficiency labels that participants could face, which can be seen in the table below.

	Treatment 1		Treatment 2		Treatment 3		Treatment 4		Treatment 5	
Washing machines	B	C	45	55	45	55	45	55	6	5
	B	D	45	65	45	65	45	65	6	4
	B	E	45	75	45	75	45	75	6	3
	C	D	55	65	55	65	55	65	5	4
	C	E	55	75	55	75	55	75	5	3
	D	E	65	75	65	75	65	75	4	3
Televisions	A	B	35	45	35	45	35	45	7	6
	A	C	35	55	35	55	35	55	7	5
	A	D	35	65	35	65	35	65	7	4
	B	C	45	55	45	55	45	55	6	5
	B	D	45	65	45	65	45	65	6	4
	C	D	55	65	55	65	55	65	5	4
Light bulbs	B	C	45	55	45	55	45	55	6	5
	B	D	45	65	45	65	45	65	6	4
	B	E	45	75	45	75	45	75	6	3
	C	D	55	65	55	65	55	65	5	4
	C	E	55	75	55	75	55	75	5	3
	D	E	65	75	65	75	65	75	4	3

These pairs were randomly allocated across respondents, such that each pair appeared an equal number of times for respondents in each country.

Prices were assigned as follows:

² ECOFYS (2013) Evaluation of the Energy Labelling Directive and specific aspects of the Ecodesign Directive. ENER/C3/2012-523.

- The price of the product with the lower rating was fixed at the average price for the country (see Table 3)
- The price of the product with the higher rating was randomly assigned one of six levels relative to the price of the other product: 1) 5% more expensive; 2) 10% more expensive; 3) 15% more expensive; 4) 20% more expensive; 5) 25% more expensive; and 6) 30% more expensive.

These are displayed in the table below. Base prices for each product came from a web sweep conducted for a previous EC study in 2010³ and were adjusted for inflation. The price levels were also based on those used in this previous study.

		Czech Republic	France	Italy	Poland	Romania	Norway	United Kingdom
Washing machine	Base	10000	385	415	1660	1835	2895	335
	+5%	10500	404	436	1743	1927	3040	352
	+10%	11000	424	457	1826	2019	3185	369
	+15%	11500	443	477	1909	2110	3329	385
	+20%	12000	462	498	1992	2202	3474	402
	+25%	12500	481	519	2075	2294	3619	419
	+30%	13000	501	540	2158	2386	3764	436
Television	Base	9000	230	150	880	970	1545	205
	+5%	9450	242	158	924	1019	1622	215
	+10%	9900	253	165	968	1067	1700	226
	+15%	10350	265	173	1012	1116	1777	236
	+20%	10800	276	180	1056	1164	1854	246
	+25%	11250	288	188	1100	1213	1931	256
	+30%	11700	299	195	1144	1261	2009	267
Light bulb	Base	85	3.3	5.7	11.7	5	20.3	1.7
	+5%	89.3	3.5	6.0	12.3	5.3	21.3	1.8
	+10%	93.5	3.6	6.3	12.9	5.5	22.3	1.9
	+15%	97.8	3.8	6.6	13.5	5.8	23.3	2.0
	+20%	102.0	4.0	6.8	14.0	6.0	24.4	2.0
	+25%	106.3	4.1	7.1	14.6	6.3	25.4	2.1
	+30%	110.5	4.3	7.4	15.2	6.5	26.4	2.2

Note: All values are in national currencies.

On-screen presentation

The two products were presented side-by-side, and there was a prompt asking respondents to pick their preferred option. The choice cards were randomised so that the better/worse energy efficiency product was swapped from left to right and vice versa.

An example of washing machines for the UK is shown below.

³ Web sweep was conducted for DG Energy Research in EU product label options, October 2012.

Figure 3: Example of on-screen presentation for choice experiment



3.4.3 Bidding experiment

In the bidding experiment respondents were informed that:

1. They would be asked to bid for the three consumer products: washing machines, televisions and light bulbs.
2. The experiment would be conducted in real currency units (i.e. €, £), with conversion rates applied to calculate how much they earned in reality.
3. They would be informed of the conversion rate once, at the beginning of the experiment.
4. They could redeem each product that they successfully 'won' (i.e. bought) for a certain amount in currency units (they were told up-front how many currency units they would receive for a washing machine, television and light bulb). This is referred to as their *redemption value*.
5. If the amount they bid for a product was above the *sale price*, they won the product and paid the sale price. The sale price was randomly drawn from a pre-specified interval (they were told what the interval is). The sale price was re-drawn for each new bid, and participants' were told that the sale price would not remain the same across bidding opportunities.
6. Participants' earnings on the products they won were the redemption value *minus* sale price.
7. If participants derived value/utility from goods that are more environmentally friendly, then they would be willing to bid this 'environmental value' above their private benefit.

8. If participants bid above their redemption value, and they won the good and the sale price was greater than their redemption value then they could lose money because earnings were redemption value *minus* sale price.
9. To prevent participants making losses in the experiment we gave participants an endowment for each product they bid on. This endowment then decreased in cases where the participant won the good and the sale price was greater than their redemption value.
10. We incentivised the environmental externalities (higher energy efficiency rating) using the following text:

If you win products that are energy efficient Ipsos will make a financial contribution towards environmental improvements. The size of the contribution will depend on how energy efficient these products are. If you win highly energy efficient products then the contribution will be greater.

This was important to ensure saliency in the experiment. In other words both the private and public benefits are incentivised, which is important for robust design. We carefully worded how the externality was incentivised in the experiment to ensure that we did not overplay the externality relative to a field setting.

At the end of the exercise, respondents received points worth the total (cumulative) redemption value of all the products that they won, minus the total that they paid.

Figure 4: Example screen from the bidding exercise

Washing Machine



Spin speed: 1400rpm
Wash load: 7kg
Sale price range: £318 - £352
Resale value: &335

As discussed in the description of the choice experiment, research has shown that the majority of washing machines, televisions and light bulbs purchased recently across the EU fall into just four

different energy efficiency categories. Therefore, as in the choice experiment, only these four levels are included in the bidding exercise.

Ratings were randomly drawn from the range of ratings, with the restriction that each individual rating appeared an equal number of times for respondents in each country. The list of possible energy efficiency ratings are listed below in Table 4.

Table 4: Bidding experiment energy efficiency ratings

	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5
Washing machine	B,C,D,E	45,55,65,75	45,55,65,75	45,55,65,75	6,5,4,3
Television	A,B,C,D	35,45,55,65	35,45,55,65	35,45,55,65	7,6,5,4
Light bulbs	B,C,D,E	45,55,65,75	45,55,65,75	45,55,65,75	6,5,4,3

The two most energy efficient ratings in each of the treatments for each product were considered as 'good' and the other two energy ratings were considered 'bad'. We made donations for the good products and not for the bad products. We added text to the instructions so that respondents got feedback on when a donation was made.

Respondents were informed of their redemption values at the start of the bidding process. These were fixed for each product/respondent throughout the exercise.

Redemption values were set similar to market prices in each country. These were based on a previous web sweep conducted for EC DG Energy in 2010⁴ and adjusted for inflation. The redemption values are shown in the table below.

Table 5: Redemption values used in the bidding exercise

	Washing machine (1,400 rpm, 7 kg)	Television (LED, 32 inch screen)	Light bulb (Energy Saving Halogen)
Czech Republic (CZK)	10000	9000	85
France (EUR)	385	230	3.3
Italy (EUR)	415	150	5.7
Poland (PLN)	1660	880	11.7
Romania (LEU)	1835	970	5
Norway (NOK)	2895	1545	20.3
United Kingdom (GBP)	335	205	1.7

Note: All values are in national currencies.

Source: London Economics' web sweep conducted during May 2012 and adjusted for national sectoral inflation. Average prices across a set of brands for each product available from a range of online retailers for each Member State.

Sales prices were drawn from a uniform distribution where the minimum possible price was below the redemption value and the maximum possible price was above the redemption value. We set the maximum sales price at 5% above the redemption value and the minimum sales price at 5% below the redemption value for washing machines and televisions. For light bulbs we set the

⁴ Web sweep was conducted for DG Energy Research in EU product label options, October 2012.

maximum sales price 10% higher than the redemption value with a lower range of 10% below the redemption value.⁵

3.4.4 Incentivised interpretation test

To gauge participants’ understanding of the five different label designs used in the different treatments, we implemented an incentivised interpretation test.

To test understanding of the designs used in the **alphabetic closed scale**, **numeric closed scale** and **reverse numeric closed scale** framings participants were shown three energy efficiency labels side-by-side for each of the designs and were asked to select the most energy efficient rating. The figure below shows an example for the alphabetic closed scale.

Figure 5: Example understanding question

Please select the product you think is the most energy efficient.

I do not know

Note:
Source:

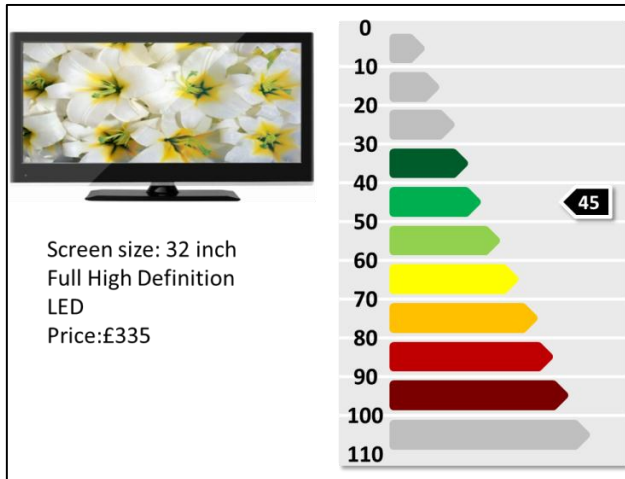
Testing the understanding of the design used in the **numeric open scale** framing was undertaken by showing an example product and energy efficiency label with three possible explanations of the meaning of the grey arrows indicating the open-ended scale. The figure below presents this question.

Note:

Source:⁵ This approach was adopted following an earlier experimental study for DG Energy Research in EU product label options, October 2012.

Figure 6: Understanding test numeric open scale

Looking at the grey arrows at the top of the label, please select the appropriate answer.



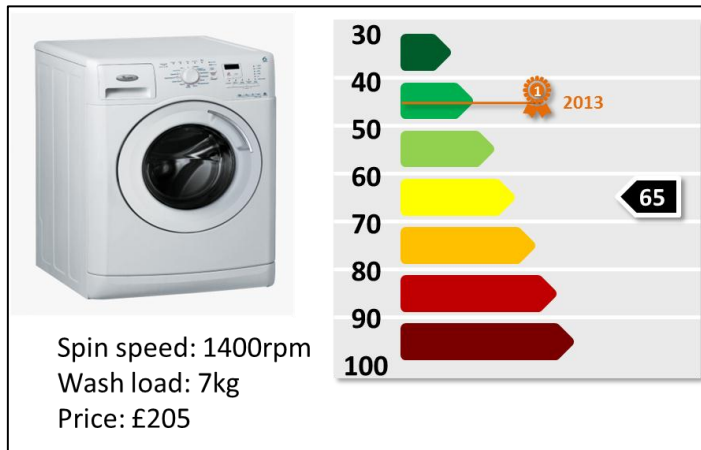
The grey arrows at the top of the label indicate the following:

1. They indicate the energy rating of televisions that are available in other countries
2. They indicate the energy rating of products other than televisions
3. They indicate the energy rating of televisions that will be available on the market in the future
4. I do not know

The test of understanding of the design of the **numeric closed scale with benchmark marker** framing involved participants viewing an example product and energy efficiency label with a three possible explanations for the meaning of the orange label indicating the best energy efficiency product currently available in the market. The figure below shows this question.

Figure 7: Please use sentence case

Looking at the orange marker, please select the appropriate answer.



The orange marker on the label indicates:

1. The energy efficiency of a washing machine that will be available on the market in the future
2. The best energy efficiency washing machine currently available on the market
3. The energy efficiency of the washing machine shown in the picture above
4. I do not know

All participants were asked to answer all of the interpretation test questions, even if they had not viewed that particular label design in the experiment. Our reason for doing this was to understand whether people who had never seen these alternative energy efficiency label designs could identify the meaning of these labels without additional explanation. This would replicate the experience of consumers being faced with these labels on products in the real world for the first time.

3.4.5 Questionnaire

Participants were also asked a range of questions to understand their past experience of buying household products and prior knowledge of energy efficiency labels.

They were asked whether they had previously seen the current energy labels applied to washing machines, televisions and light bulbs. Additionally they were asked which household products they had bought recently and which attributes were important to them when they were making such a purchase.

As well as these questions, all participants were asked socio-demographic questions, which could be used in the analysis of their behaviour and responses throughout the behavioural experiment.

4 Understanding of the different energy label framings

In this section we present the observations from the incentivised interpretation test. The key findings are presented in the box below.

Box 1: Interpretation test key findings

- Understanding of the **alphabetic**, **numeric** and **reverse numeric closed scale** energy label framings are very high (over 90%). This supports previous research where understanding was also good for these frames (Consumer Focus, 2012; Heinzle & Wuestenhagen, 2009 in regard to A-G scales, Egan and Wade 2005 on numeric scales).
- **Alphabetic**, **numeric** and **reverse numeric closed scale** framings are each understood very well even by those who do not receive a prior explanation of the framing, which may suggest similarities across the framings (e.g. colour coding scale) may be a major component in their understanding.
- The **alphabetic closed scale** framing is understood by the highest proportion of participants (both those who had received an explanation and those that had not), in line with previous research (Egan & Waide, 2005).
- Explanation of the different framings can lead to improvements in the levels of understanding. This highlights the importance of educational campaigns/good visible explanations alongside label designs.
- Understanding of the grey arrows in the **open scale** framing is not as good. 61% of participants who receive an explanation of the framing are able to correctly identify the meaning of the grey arrows. This proportion is much lower for those individuals that do not receive an explanation (32%).
- The **benchmark marker** indicating the best available technology is understood by most participants without prior explanation (68%), surprisingly this proportion is slightly lower for those that receive an explanation of the marker (57%).

This section considers the results of the incentivised interpretation test and hence focuses on consumer understanding of the different energy label framings used in the choice experiment and BDM bidding exercise. To recap, the five different energy label framings are:

- Alphabetic closed scale
- Numeric closed scale
- Numeric open scale
- Numeric closed scale with a benchmark marker
- Reverse numeric closed scale

We may expect to observe differences in the levels of understanding across participants depending on the label design treatment group in which they were in.

The reason for this is that prior to the choice experiment and bidding exercise, once participants had been randomly placed into a specific treatment group, they received an explanation of the

particular label design which they would face in these two parts of the behavioural experiment. The four alternative label designs are not explained to them.

Therefore, we may expect participants to have a better understanding of the label design which they receive an explanation of, but not as good an understanding of the alternative label designs.

However, we may also expect participants to have a good understanding of the **alphabetic closed scale** framing as it is similar to the current EU energy label. The difference between the two is that the framing we are testing does not include ratings above A (e.g. A+, A++ etc.), as previous research suggests these ratings are not well understood by consumers.⁶

We have tested the understanding of different framings of label designs on participants who do not receive prior explanation of the designs in order to recreate the experience of consumers viewing these labels for the first time when making a purchasing decision.

Therefore, throughout this section we will consider the understanding of each of the different energy label framings by those in that specific label framing group and also by those in the alternative groups.

4.1 Ability to identify the most energy efficient product

As discussed in the design section above, there are three questions in the incentivised interpretation test which asked participants to choose the most energy efficient product with each question relating to a different energy label framing. These test participant understanding of the **alphabetic closed scale**, **numeric closed scale** and **reverse numeric closed scale** framings.

We find that consumer understanding of each of these framings is very high. At least 90% of participants were able to identify the most energy efficient product when faced with a choice of three different energy efficient ratings in each of these different framings irrespective of whether they received a prior explanation or not.

The fact that even participants who do not receive prior explanation of the specific energy label framings had a very good understanding of the framings may suggest that they are noticing the similarities between the framings (e.g. colour coding scale) and using these to make their decision.

While overall understanding is high, there is a slight difference in understanding between these two groups (information and no information). In the case of the **numeric closed scale** and **reverse numeric closed scale** framings this difference is statistically significant.⁷

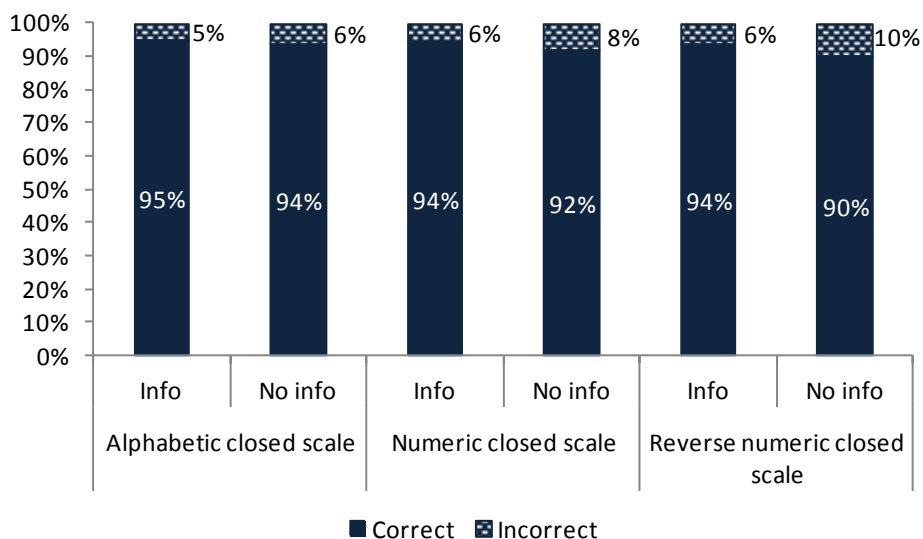
The **alphabetic closed scale** framing had the highest proportion of participants able to correctly identify the most energy efficient product, both those who had received an explanation of the framing design and those who had not. The similarity between the **alphabetic closed scale** framing and the current EU energy label is likely to be the reason for this higher level of understanding. Indeed we find that participants who had seen the current EU energy label on a washing machine,

⁶ Consumer Focus, 2012.

⁷ Both are statistically significant at the 99% level.

television or light bulb before the experiment are more likely to correctly identify the most energy efficient product when faced with the question relating to the **alphabetic closed scale** framing.⁸

Figure 8: Share of participants that could correctly identify the most energy efficient product when faced with different energy label framings



Note: Results are split between those who received an explanation of the specific energy label framing (Info) and those who did not (No info).

Source: *Incentivised interpretation test*

4.2 Understanding of specific elements of different energy label framings

There are two questions in the incentivised interpretation test which ask participants to identify the meaning of specific elements of an energy label framing. These test participant understanding of the grey arrows in the **numeric open scale** framing and the benchmark marker indicating the best available technology in the **numeric closed scale with benchmark marker** framing.

We find that 61% of participants that receive an explanation of the meaning of the grey arrows on the **numeric open scale** framing are able to correctly identify their meaning in the incentivised interpretation test. This finding shows that even with an explanation, over a third of participants cannot correctly understand the meaning of the open ended scale.

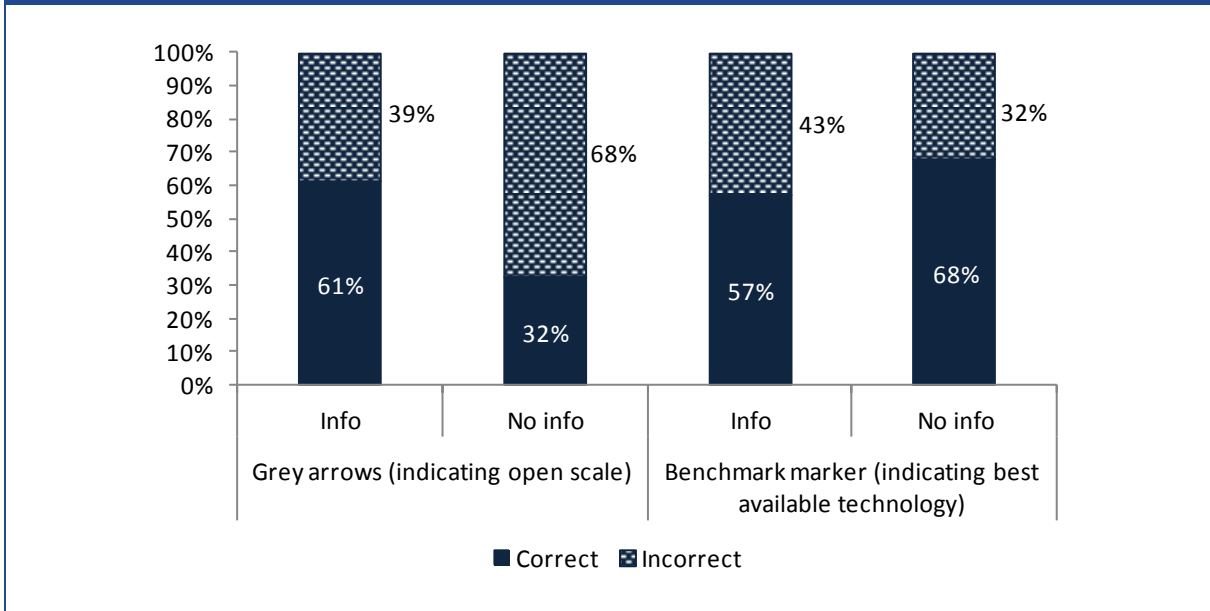
The grey arrows were less well understood by those who did not receive an explanation of their meaning at the beginning of the experiment and this difference is unlikely to have occurred simply by chance.⁹ Under a third of these individuals correctly identify the meaning of the grey arrows on the open ended scale.

⁸ Statistically significant at 99% level.

⁹ Statistically significant at 99% level.

We find that 57% of participants who receive prior explanation of the benchmark marker used in the **numeric closed scale with benchmark marker** framing are able to correctly identify its meaning from the choice of three possible alternatives. Surprisingly however, a higher proportion of those participants that did not receive an explanation are able to correctly identify the meaning of the benchmark marker.¹⁰

Figure 9: Share of participants that could correctly identify the meaning of specific features of different energy label framings



Note: Results are split between those who received an explanation of the specific energy label framing (Info) and those who did not (No info). The 'Grey arrows indicating open scale' compares the results of those in the numeric open scale framing and those in other framings. The 'Benchmark marker' compares the results of those in the numeric closed scale with benchmark marker framing and those in other framings.

Source: *Incentivised interpretation test*

¹⁰ We find that the participants in the **numeric closed scale with benchmark marker** framing did significantly worse in the incentivised interpretation test than those in other treatment groups, when we consider responses to each of the five questions.

5 Impact of different energy label framings on consumer behaviour

5.1 Experiment analysis methodology

The bidding exercise and the choice experiment are designed such that comparisons between product choice and willingness to pay for each of the three products can be made across the 5 alternative energy label framings:

- Alphabetic closed scale
- Numeric closed scale
- Numeric open scale
- Numeric closed scale with a benchmark marker
- Reverse numeric closed scale

The baseline framing is the **numeric closed scale** framing. Through a comparison of the behaviour of those participants in alternative framings to the behaviour of those in this framing we are able to elicit the impact of specific changes to energy labels.

We test the impact of the following variations in energy label framing:

- Numeric vs Alphabetic scale
- Closed vs Open scale
- No benchmark marker vs Benchmark marker
- Decreasing vs Increasing scale

We are able to isolate the impact on behaviour of moving from a numeric to an alphabetic scale through comparing the results of those individuals in the **numeric closed scale** framing and those in the **alphabetic closed scale** framing [**Numeric vs Alphabetic scale**].

A comparison of the results of participants in the **numeric closed scale** framing and those in the **numeric open scale** framing enables us to isolate the effect of moving from a closed scale to an open-ended scale [**Closed vs Open scale**].

We isolate the impact of adding a benchmark marker indicating the best available technology on the market by comparing the results of participants in the **numeric closed scale** framing and those in the **numeric closed scale with the best available technology marker** framing [**No benchmark marker vs Benchmark marker**].

The effect of moving from a decreasing to an increasing numerical scale is gauged by comparing the results of those individuals in the **numeric closed scale** framing and those in the **reverse numeric closed scale** [**Decreasing vs Increasing scale**].

5.2 Impact of different energy label framings on consumer bidding behaviour

Box 2: Bidding exercise key findings

- Participants are, on average, willing to bid more for more energy efficient products for each of the three products (washing machine, television and light bulb) across each of the five energy label framings.
- These differences are unlikely to have resulted simply by chance and therefore show real changes in behaviour as a result of different energy efficiency ratings.
- However, when we compare between frames the bidding exercise does not provide conclusive evidence that one frame leads to a higher average bid for more energy efficiency products relative less energy efficient products.

In the BDM bidding exercise, there are four energy efficiency ratings in each of the five different framings for each of the three products, so 60 energy efficiency ratings in total. These are grouped into two categories for the purposes of the analysis, ‘good’ and ‘bad’.

The four energy efficiency ratings in each framing for each product are assigned to the two categories with two ‘good’ and two ‘bad’ ratings. For example, washing machines in the **alphabetic closed scale** framing could have an energy efficiency rating ‘B’, ‘C’, ‘D’ or ‘E’. Therefore ‘B’ and ‘C’ are classed as ‘good’ ratings and ‘D’ and ‘E’ are classed as ‘bad’ ratings.

Our analysis of the BDM bidding experiment consists of three elements

- 1) Analysis of the average bids for ‘good’ and ‘bad’ products for each of the three products in each of the five different energy label framings
- 2) Analysis of whether the differences between these average bids for ‘good’ and ‘bad’ products are unlikely to have resulted simply by chance.¹¹
- 3) Analysis of differences in bidding behaviour across the five different energy label framings

5.2.1 Analysis of the average bids for ‘good’ and ‘bad’ products

Through grouping the bids made by participants depending on the product, energy rating and energy label framing they were faced with, it is possible to derive average (mean and median) bids.

The results of the bidding experiment show that the average bids for a ‘good’ product is higher than those of a ‘bad’ product across each of the products across each framing. Considering televisions, for example, we find that the difference between the mean bid for a ‘good’ and a ‘bad’ product in the **alphabetic closed scale** framing is €5.

¹¹ Whether the differences were statistically significant.

Table 6: Average bids in BDM bidding experiment under each energy label framings (€)

	Alphabetic closed scale		Numeric closed scale		Numeric open scale		Numeric closed scale with a benchmark marker		Reverse numeric closed scale	
	Good	Bad	Good	Bad	Good	Bad	Good	Bad	Good	Bad
Mean										
Light Bulb	3.22	3.15	3.23	3.16	3.25	3.15	3.27	3.14	3.22	3.18
TV	226	221	226	222	226	222	226	222	225	223
Washing machine	398	393	399	393	399	393	398	394	399	393
Median										
Light Bulb	3.00	2.97	3.00	2.99	3.00	2.99	3.07	2.98	2.99	2.99
TV	227	225	227	225	227	225	228	225	228	225
Washing machine	400	394	400	395	401	395	400	395	401	394

Note: For a comprehensive explanation of 'good' and 'bad' please refer back to the methodology and Table 5 and the subsequent explanation.

Source:

5.2.2 Analysis of whether the differences between the average bids for 'good' and 'bad' products are unlikely to have resulted simply by chance

In the above section, we have shown the average bids made for each of the products in each of the five energy label framings for 'good' and 'bad' products. In the table below we calculate the differences in the mean bids for 'good' and 'bad' products in each of the energy label framings.

We find that the difference in mean bids between the 'good' and 'bad' products is always positive. In all but one case, we also find that this difference is very unlikely to have occurred simply by chance.¹²

Table 7: Difference in mean bids for 'good' and 'bad' products across each energy label framing (€)

	Alphabetic closed scale	Numeric closed scale	Numeric open scale	Numeric closed scale with a benchmark marker	Reverse numeric closed scale
Light Bulb	0.07**	0.07***	0.10***	0.12***	0.04
TV	4.99***	4.05***	4.17***	3.80***	2.87**
Washing machine	4.94***	5.91***	6.04***	4.36***	5.77***

Note: * ** *** indicates the difference is statistically significant at the 90%, 95% and 99% level.

Source: BDM bidding experiment

¹² Also known as being 'statistically significant'.

5.2.3 Analysis of differences in bidding behaviour across the five different energy label framings

We can identify differences in bidding behaviour across the different energy label framings through a comparison of the difference in mean bids for 'good' and 'bad' products (shown in Table 7).

We test whether variations in the difference in mean bids for 'good' and 'bad' products across energy label framings are unlikely to have simply resulted by chance and can be said to be 'statistically significant'.

Table 8 which contains the numeric difference in the mean additional amount participants are willing to bid for the 'good' rather than 'bad' products across the framings. The asterisks indicate statistical significance. Each of the differences is calculated by subtracting the mean additional amount participants are willing to bid for the 'good' rather than 'bad' products in a particular energy label framing against the equivalent value from the **numeric closed scale** framing.

For example, the difference between the 'Closed vs Open scale' for a light bulb is - 0.03 and this is calculated as $(0.07 - 0.10)$, which from Table 7 we can see are the mean additional amount participants are willing to bid for a 'good' rather than 'bad' light bulb in the **numeric closed scale** framing and the **numeric open scale** framing, respectively. This illustrates that the average difference in the amount participants are willing to pay between good and bad products is greater in the numeric open scale than in the numeric closed scale.

We find that in the case of washing machines, the difference between the average 'good' and average 'bad' bids is greater in the **numeric closed scale** framing than in the **alphabetic closed scale** framing and this difference is unlikely to have resulted by chance.¹³

This finding suggests the use of a numeric rather than alphabetic framing would be favourable. It is not a conclusive finding though, as it is only true for washing machines and not the other two products.

We also identify that there is a difference between 'good' and 'bad' average bids in the **numeric closed scale** framing than in the **numeric closed scale with benchmark marker** framing for washing machines and this difference is unlikely to have resulted by chance.¹⁴

This finding suggests that the inclusion of a benchmark marker displaying the best available technology would not be beneficial in terms of encouraging participants to pay a greater differential for 'good' rather than 'bad' products. However this result is not conclusive as we do not find it to be the case for light bulbs or televisions.

¹³ Statistically significant at the 90% level.

¹⁴ Statistically significant at 99% level.

Table 8: Difference in the mean additional amount participants are willing to bid for 'good' rather than 'bad' products across energy label framings (€)

	Numeric vs Alphabetic scale	Closed vs Open scale	No benchmark marker vs Benchmark marker	Decreasing vs Increasing scale
Light Bulb	0.00	-0.03	-0.05	0.03
TV	-0.94	-0.11	0.25	1.18
Washing machine	0.97*	-0.13	1.55***	0.14

Note: *, **, *** indicates the difference is statistically significant at the 90%, 95% and 99% level. 'Numeric vs Alphabetic scale' is a comparison between the numeric closed scale and alphabetic closed scale framings; 'Closed vs Open scale' is a comparison between the numeric closed scale and the numeric open scale framings; 'No benchmark marker vs Benchmark marker' is a comparison between the numeric closed scale and the numeric closed scale with benchmark marker framings; 'Decreasing vs Increasing scale' is a comparison between the numeric closed scale and the reverse numeric closed scale framings.

Source: BDM bidding experiment

5.3 Impact of different energy label framings on consumer purchasing behaviour

Box 3: Key findings

Share of participants willing to pay a higher price for a more energy efficient product

- Across all energy label framings, a greater share of participants are willing to pay a price premium for light bulbs compared to the other two products. This is likely to result from the fact that the additional cost for the more energy efficient product equates to a smaller monetary value for light bulbs than the other two products, as they are the cheapest product.
- **Alphabetic closed scale** framing results in a **larger proportion of participants** being willing to pay a higher price for a more energy efficient products than the **numeric closed scale** framing.
- The inclusion of a **benchmark marker** indicating the best available technology results in a **lower proportion of participants** being prepared to pay a higher price for a more energy efficient product across all products tested.

Impact of increasing the price premium charged for the more energy efficient product on the share of participants willing to pay a higher price for that product

- As the difference in price between the more and less energy efficient product increases, the share of participants choosing the more energy efficient product falls, across all products.
- The **alphabetic closed scale** framing results in a higher proportion of participants choosing the more energy efficient product than any of the **numeric closed scale** framings at almost all price premium levels.
- The inclusion of a **benchmark marker** indicating the best available technology results in a **lower proportion of participants** being prepared to pay a higher price for a more energy efficient product at all price premiums.

Average additional amount that participants are willing to pay for a more energy efficient

product

- In the majority of cases, when faced with a choice of two products, participants are willing to pay a higher additional amount for the more energy efficient product, when there is a larger energy efficiency rating difference between the two products involved in the choice.
- For example, participants facing a decision of choosing between two products with an energy efficiency rating difference of one (e.g. 'A' vs 'B'), on average, are willing to pay a lower additional amount for the more energy efficient product than when faced with a choice between two products with an energy efficiency rating difference of two (e.g. 'A' vs 'C').

In the choice experiment, participants were asked to make hypothetical purchasing decisions between two products that varied only by price and energy efficiency rating. The product with the better energy efficiency rating is always more expensive than the less energy efficient product, referred to as a price premium

The more energy efficient product is either 5%, 10%, 15%, 20%, 25% or 30% more expensive than the less energy efficient product. Therefore those participants that choose the more energy efficient product are prepared to hypothetically pay a premium to purchase the more energy efficient product.

In the choice experiment, there are six energy efficiency label pair combinations in each of the five energy label framings for each of the three products, so 90 energy efficiency rating combinations in total (see Table 2). We analyse the results of the choice experiment based on whether the more energy efficient product was chosen or the less efficient product.

Our analysis of the choice experiment consists of three elements

- Analysis of how the energy label framings affect the share of participants willing to pay a higher price for a more energy efficient product, across the different energy label framings.
- Analysis of how the share of participants willing to pay a higher price for a more energy efficient product changes as the premium increases, across the different energy label framings.
- Analysis of average additional amount that participants are willing to pay for a more energy efficient product, across the different energy label framings.

5.3.1 Analysis of how the energy label framings affect the share of participants willing to pay a higher price for a more energy efficient product

The first aspect of the choice experiment that we consider is the proportion of participants that are willing to pay a premium to purchase the more energy efficient product and whether this varies depending on the energy label framing.

We find that in each of the framings the product for which the highest proportion of participants is willing to pay a premium for the more energy efficient product is light bulbs, followed by televisions and then washing machines.

A possible reason for this ordering is that as light bulbs are the cheapest of the three products, the price differential between the more and less energy efficient product is the smallest in absolute terms. Therefore more participants appear to be content to pay a 5%-30% higher price for the more energy efficient light bulb as in monetary terms this difference is smaller than for televisions and washing machines.

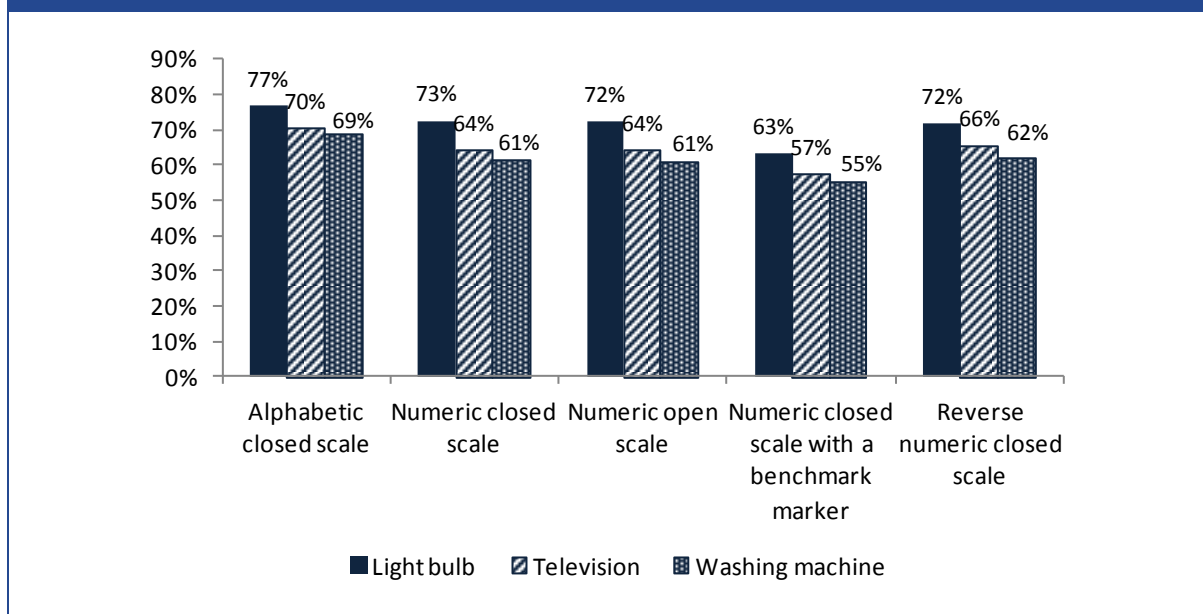
Impact of different energy label framings

We observe that the energy label design which has the highest proportion of participants purchasing the more energy efficient product is the **alphabetic closed scale** framing. This is the case for each of the three products.

As with the BDM bidding exercise results, we will analyse the impact of different energy label framings by considering the following comparisons:

- Numeric vs Alphabetic scale
- Closed vs Open scale
- No benchmark marker vs Benchmark marker
- Decreasing vs Increasing scale

Figure 10: Share of participants willing to pay a premium for the more energy efficient product across the different energy label framings



Note:

Source: Choice experiment

Numeric vs Alphabetic scale

We find that a higher proportion of respondents faced with the **alphabetic closed scale** label design are willing to pay a premium for the more energy efficient product than in the **numeric closed scale** framing.

A 4% higher proportion of participants in the **alphabetic closed scale** framing (77%) are willing to pay a premium for more energy efficient light bulbs than in the **numeric closed scale** framing (73%). For televisions the difference is 6% and for washing machines the difference is 8%. All of these differences are statistically significant.¹⁵

Closed vs Open scale

We do not identify any clear differences between closed and open scales on the proportion of participants willing to pay a premium for a more energy efficient product.¹⁶ Figure 10 shows that across the **numeric closed scale** framing and the **numeric open scale** framing the proportion of participants willing to pay a premium for the more energy efficient product is very similar for each of the three products.

No benchmark marker vs Benchmark marker

We find that the inclusion of a benchmark marker leads to a lower proportion of participants being prepared to pay a premium for a more energy efficient product.

For light bulbs there is a 10% lower proportion of participants willing to pay a premium for a more energy efficient product in the **numeric closed scale with a benchmark marker** framing than in the **numeric closed scale** framing. This difference is 7% for televisions and 6% for washing machines.¹⁷

Decreasing vs Increasing scale

We do not find a consistent effect of moving from a decreasing to an increasing scale on the share of participants willing to pay a premium for a more energy efficient product.

We observe that a higher proportion of participants in the **numeric closed scale** framing are willing to purchase a more energy efficient light bulb than in the **reverse numeric closed scale** framing. However, for televisions and washing machines we find a higher proportion of participants in the **reverse numeric closed scale** framing are willing to pay such a premium than in the **numeric closed scale** framing.¹⁸

¹⁵ Each of these three differences are statistically significant at 99% level.

¹⁶ No differences are statistically significant at the 90% level.

¹⁷ Statistically significant at 99% level.

¹⁸ Not statistically significant at 90% level.

5.3.2 Share of participants willing to pay a higher price for a more energy efficient product carrying the different energy label framing as the premium increases

In addition to considering the share of participants willing to pay a premium for a more energy efficient product, we can also observe how this share changes as the size of the premium increases.

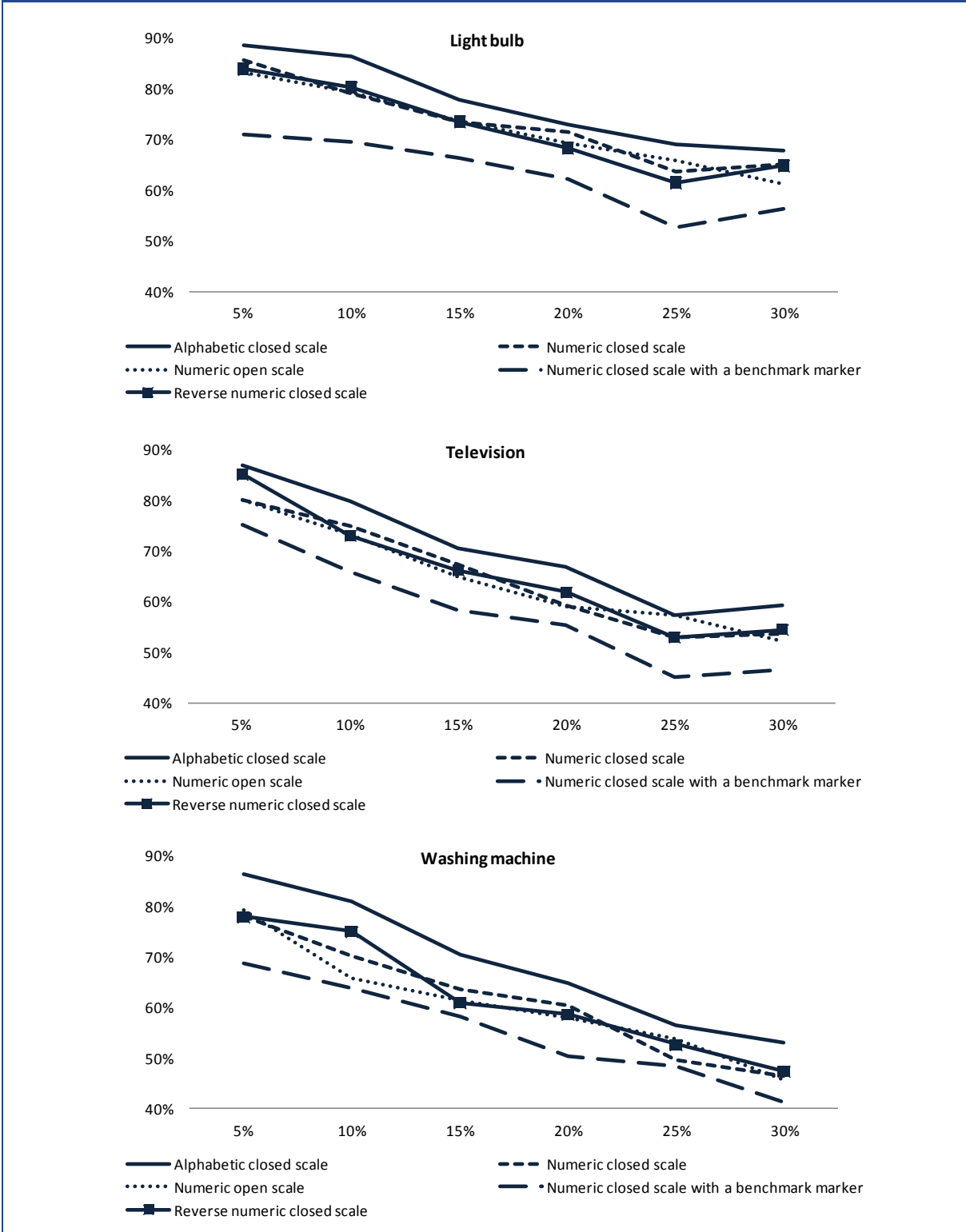
Figure 11 below shows the share of respondents that chose the more energy efficient product as the price premium charged for the more energy efficient product increases. There are three charts (one for each product) and on each of the charts there are five lines (one for each framing).

We find across all products tested that as the price premium charged for the more energy efficient product increases the share of participants choosing this product decreases. This can be seen by the downward trend in Figure 11.

We observe that there is a higher proportion of participants in the **alphabetic closed scale** framing than in other framings that choose the more energy efficient product at each of the different price premium levels, across the three products. For example, when the price charged for a more energy efficient light bulb is 5% higher than the price charged for the less energy efficient light bulb, 89% of participants choose the more efficient light bulb in the **alphabetic closed scale** framing. In the case of televisions this is 87% and for washing machines it is 86%.

The numeric closed scale, numeric open scale and the reverse numeric scale framings perform relatively similarly. However, we can clearly observe that the share of participants willing to pay a premium for a more energy efficient product in the **numeric closed scale with benchmark marker** frame, is consistently below that for all other frames. For example, when the price charged for a more energy efficient light bulb is 5% higher than the price charged for the less energy efficient light bulb, 71% of participants choose the more efficient light bulb in the **numeric closed scale with benchmark marker** framing. This proportion is much lower than is found in the other framings.

Figure 11: Share of participants willing to pay a higher price for more energy efficient products as the premium increased



Note: Horizontal axis indicates level of the price premium charged for a 'good' product, Vertical axis indicates share choosing 'good' product.

Source: Choice experiment

5.3.3 Average additional amount that participants are willing to pay for a more energy efficient product

In this section, we analyse the average additional amount that participants are willing to pay for a more efficient product and whether this varies depending on the energy label framing, as known as the average minimum premium (See Box 4).

It should be noted that the results from this section are lower bound estimates of the additional amount that participants are willing to pay for a more energy efficient product. This is due to the fact that they are calculated based on the choices made by participants in the choice experiment which does not inform us of the maximum additional amount they would be willing to pay for the more energy efficient product. A more detailed explanation of this can be found in Box 4.

Box 4: Explanation of average minimum premium

To explain this using an example, if a participant from Italy was faced with the following two options for a television:

Price: €150 and Energy efficiency rating: C

Price: €180 and Energy efficiency rating: B

If they choose the second option, this shows that they are prepared to pay at least a €30 premium for the more energy efficient option. However, this participant may have been willing to pay a much higher premium for a television with an energy efficient of 'B' rather than one with an energy efficiency rating of 'C'. However, this potentially higher price premium was not included in the set of choices within the experiment. (Table 3 shows the price premiums included in the choice experiment).

Since the results of the choice experiment do not allow us to know exactly how much of a premium participants are willing to pay for the more energy efficiency product, we say that when a participant chooses the more energy efficient product, the premium they pay is the minimum premium they are willing to pay.

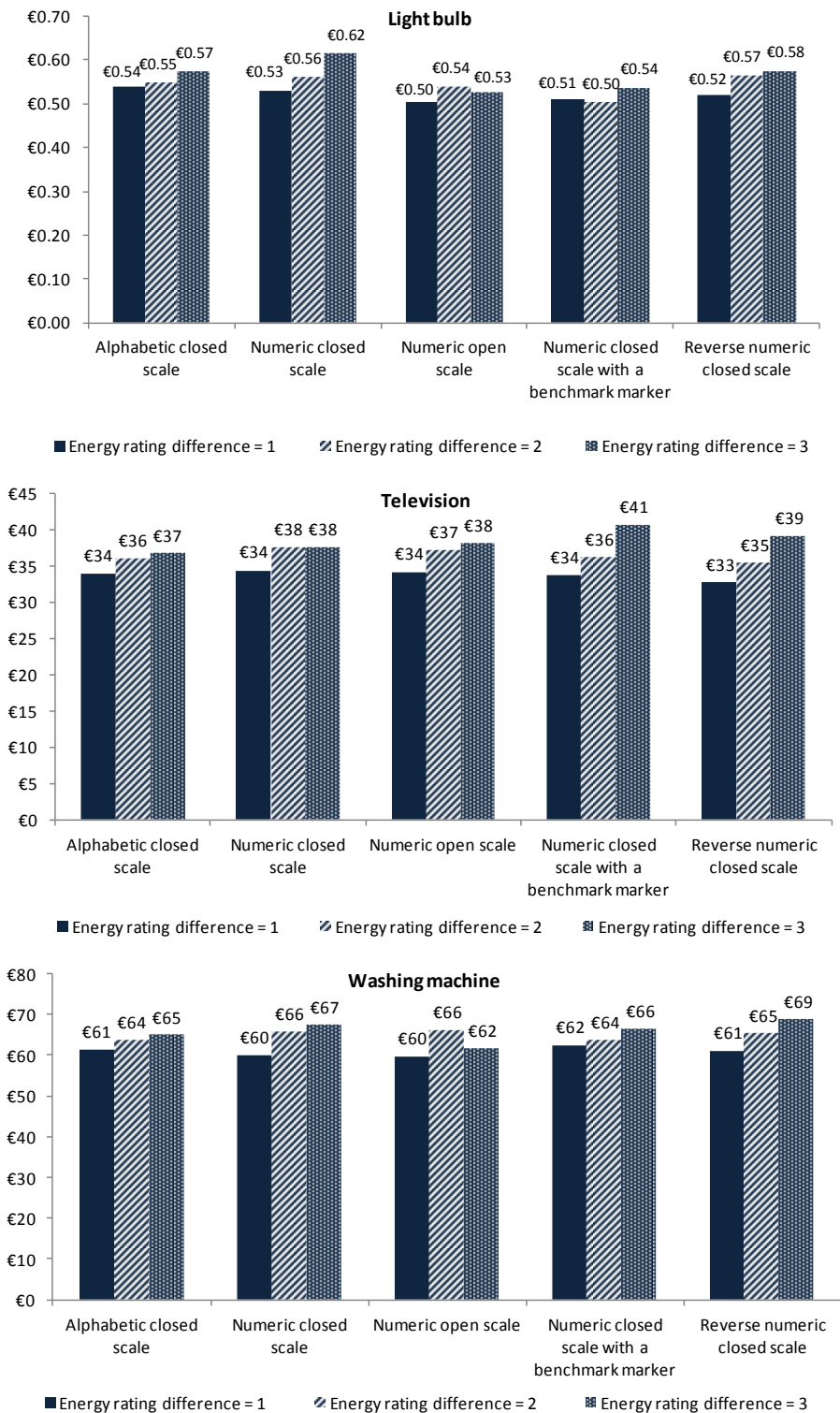
In Figure 12 we show the average minimum amount that participants are willing to pay for a more energy efficient product across each of the different framings and for each product. We divide the results depending on the energy efficiency rating difference between the two products involved in the choice experiment decision. Given the energy efficiency combinations used in the choice experiment the energy efficiency rating difference is either 1, 2 or 3 levels.

For example, if a participant in the **alphabetic closed scale** framing is faced with a decision of choosing between a product with an energy efficiency rating of 'B' and another of 'C', the energy efficiency rating difference is 1. Similarly, if they are faced with a choice between a 'B' rated product and a 'D' rated product, the energy efficiency rating difference is 2. Finally if they are faced with a choice between a 'B' or an 'E' rated product, the energy efficiency rating difference is 3.

We observe in Figure 12 that participants are willing to pay a higher premium for products with a larger energy efficiency rating difference, in the majority of cases. For example, participants in the

numeric closed scale with benchmark marker framing are willing to pay €2 more for a television that is two energy efficiency ratings higher than the alternative product (Energy rating difference = 2) than they would pay for a television that is one energy efficiency rating higher than the alternative (Energy rating difference = 1).

Figure 12: Average minimum premium participants are willing to pay for a more energy efficient product, by energy efficiency rating difference



Note: Horizontal axis indicates level of the price premium charged for 'good' product, Vertical axis indicates share choosing 'good' product.

Source: Choice experiment

In Table 9 below, we show the differentials between the average additional amount that participants are willing to pay for the more energy efficient product depending on the energy efficiency rating difference between choices, for each product across each framing.

The 'Energy efficiency rating difference' column in Table 9 describes the particular differential of interest. It details the difference in the energy efficiency rating in each of the choices that are being compared.

For example, the additional amount that participants are willing to pay for the more energy efficient product when the energy efficiency rating differential is 2 (e.g. choosing an 'A' rated product rather than a 'C' rated product) compared to when the energy efficiency rating differential is 1 (e.g. choosing an 'A' rated product rather than a 'B' rated product) would be described as '2 vs 1' in the 'Energy efficiency rating difference' column in Table 9.

In all but two cases, this differential is positive, which means that participants are willing to pay a higher premium for a product when there is a greater difference in the energy efficiency rating between the two products.

In approximately half of all cases we find that the additional premium that participants are willing to pay for a more energy efficient product when the energy efficiency rating differential is larger is statistically significant.

Table 9: Differential between the average additional amount participants are willing to pay for a more energy efficient product depending on the energy efficiency rating difference

Product	Energy efficiency rating difference	Alphabetic closed scale	Numeric closed scale	Numeric open scale	Numeric closed scale with a benchmark marker	Reverse numeric closed scale
Light bulb	2 vs 1	€0.01	€0.03*	€0.04**	-€0.01	€0.05***
Light bulb	3 vs 2	€0.03	€0.06**	-€0.01	€0.03	€0.01
Light bulb	3 vs 1	€0.03***	€0.09***	€0.03	€0.03	€0.06***
Television	2 vs 1	€2**	€3***	€3***	€2**	€3**
Television	3 vs 2	€1	€0	€1	€4***	€4***
Television	3 vs 1	€3**	€3**	€4***	€7***	€6***
Washing machine	2 vs 1	€2	€6***	€6***	€1	€4**
Washing machine	3 vs 2	€1	€1	-€4**	€3	€3
Washing machine	3 vs 1	€4*	€7***	€2	€4*	€8***

Note: *, **, *** indicates the difference is statistically significant at the 90%, 95% and 99% level.

Source: Choice experiment

We did not however identify any clear patterns relating to the impact of different energy label framings on the additional amount that participants were prepared to pay for a more energy efficient product.

6 Conclusions and recommendations

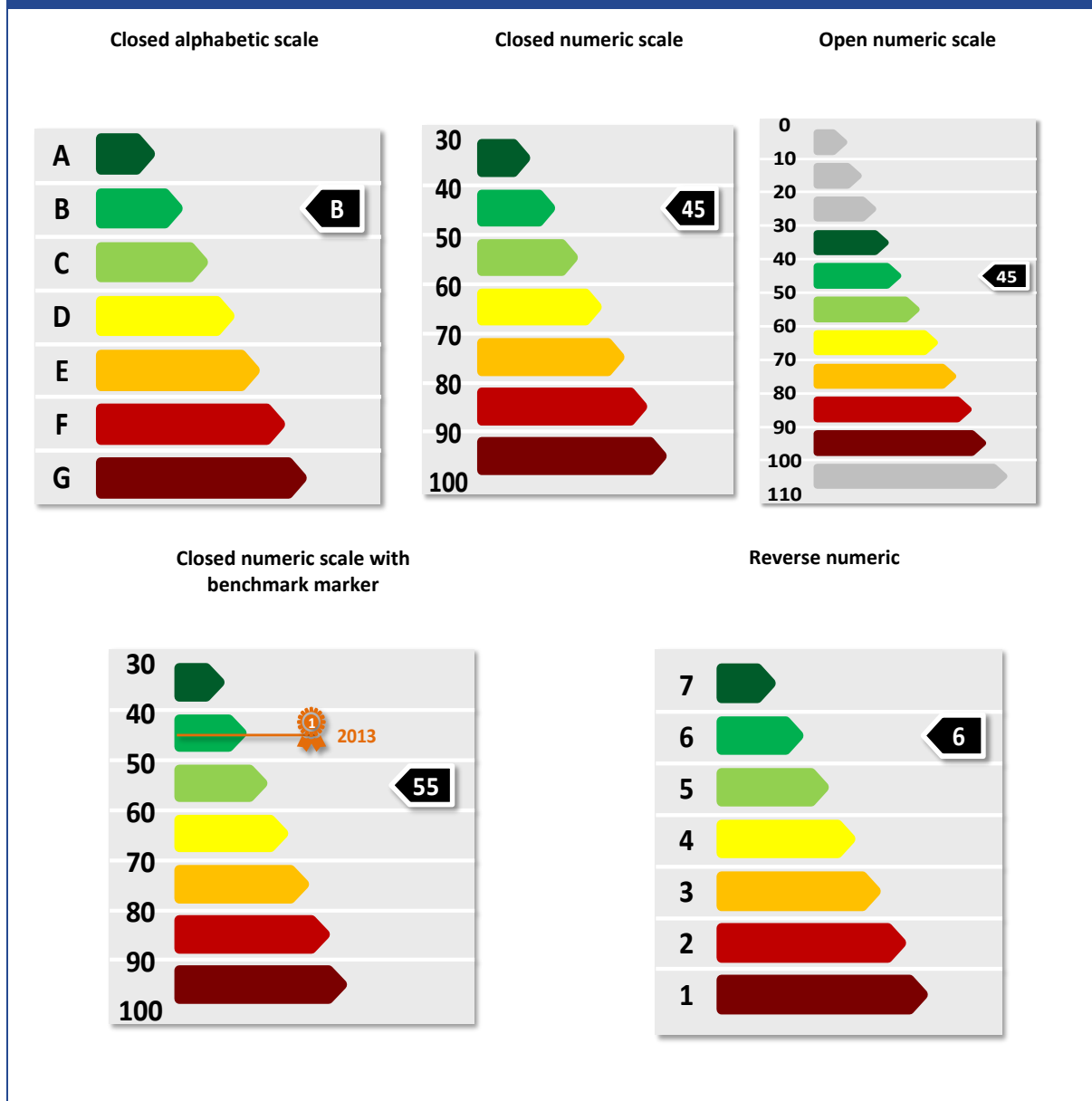
The online experiment was designed to test respondents' understanding of alternative energy label frames/designs and to investigate how the frames impact upon consumer purchasing behaviour. The online experiment was a simulated purchasing situation and as such no products were actually purchased in the experiment. However, the experiment did include monetary incentives which simulate the monetary impacts of such purchases in the field.¹⁹

The objective of the experiment is to inform phase II of the study where four label designs will be tested in the field.

The labelling frames/designs tested in the experiment are shown in the figure below.

¹⁹ The monetary incentives in the experiment are much smaller than the monetary impacts in the field.

Figure 13: Label frames used in the experiment



Three experiments were conducted, an incentivised understanding quiz, a bidding exercise and a choice experiment. Each of these are briefly explained below. A detailed explanation can be found in chapter 3.

- **Incentivised understanding quiz:** Respondents were asked 5 questions to test their understanding of each of the 5 frames included in the experiment. They received points which could be translated into monetary vouchers for each correct answer.
- **A bidding exercise:** Respondents were shown one product at a time with a label and asked to state what they would be willing to bid for that product. Products differed according to their energy efficiency rating. Each respondent made three bids on each of the three products. Respondents only experienced one label frame. The experiment was

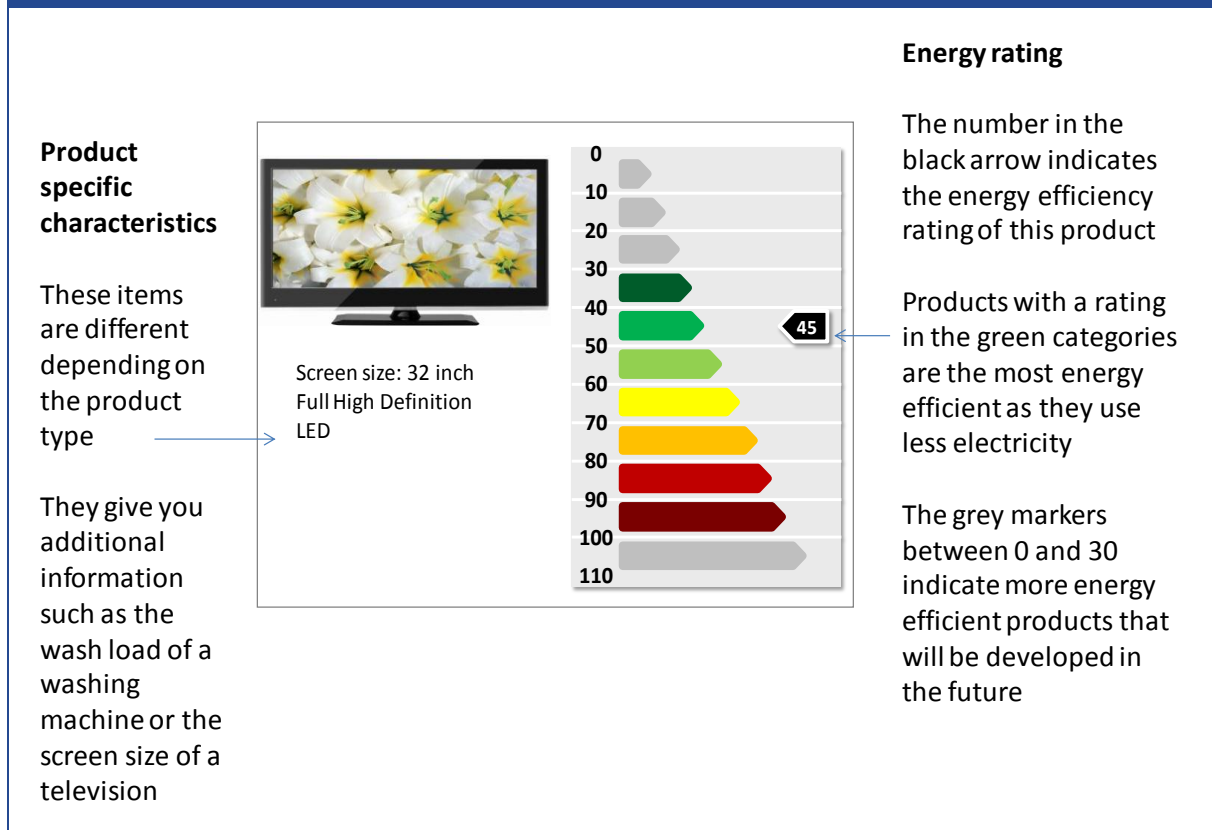
incentivised as respondents received the difference between their redemption value and the price they bid if they successfully won the product in the experiment. The redemption value represents the satisfaction the respondent would get from using the product.

Redemption values are commonly used in controlled experiments in order to ensure the experiment is correctly incentivised. This allows a direct comparison in terms of what respondents would be willing to pay for more energy efficient goods between frames included in the experiment.

- **A choice experiment:** Respondents were shown two products at a time. Each product was affixed with a label, and the products had different energy ratings. Within a choice both products had the same label but different energy efficiency ratings. Each product had a price, with the more energy efficient product always associated with a higher price. Respondents were then asked to choose which product they preferred. As in the bidding experiment each respondent experienced one frame. This experiment was not incentivised. Namely, respondents did not earn points depending on their choices. This experiment also allows direct comparison of respondents' willingness to pay between frames.

In addition, before starting the experiment, 50% of respondents were given an explanation of the label frame they would see in the bidding and choice exercises. The objective was to test if providing some explanation of the frames had an impact on understanding and behaviour in the experiment. An example explanation/information screen is shown below.

Figure 14: Example explanation/information screen used in the behavioural experiment: Open ended numeric scale



Respondent **understanding** of the **alphabetic, numeric and reverse numeric closed scale** frames was very high. Even for those respondents who had not received any explanation of what the scales meant, **90% or more were correctly able to identify the most energy efficient product from a set of 3 products shown side by side** for these three frames. In contrast, understanding of the open ended scale and the frame which included the benchmark marker was much lower. For the open ended scale 61% of respondents who had received prior explanation (and 32% who had not received this information), correctly responded that the grey arrows on the open ended scale represented the energy rating of products that would be on the market in the future. In the case of the benchmark marker, 57% of respondents that had received prior explanation correctly responded that the marker indicated the best energy efficient product currently available on the market. Somewhat unexpectedly, those respondents who had not received any explanation of the marker did better than those who had. In this case 68% chose the correct answer. However, it should be noted that respondents in the numeric closed scale with benchmark marker framing did significantly worse in the incentivised interpretation test than those in other framing groups, across all five understanding questions. There is no clear reason for this, as this group differed in no systematic way compared to the others in terms of socio-demographic characteristics. One explanation may be that this additional information was not used by the respondents who instead focused on the coloured scale. This is in line with the high levels of understanding in the alphabetic, numeric and reverse numeric closed scales where respondents may have been guided

by the colour coding, which they would have most likely seen before, to greater extent than the letters or numbers.

Providing an explanation on the frame meanings lead to significant improvements in the levels of understanding. This was particularly the case in the **numeric closed scale**, **reverse scale** and **open scale frames**. This suggests that changing the presentation of the EU energy label should be accompanied with an information campaign and/or clear explanation of the label at the point of sale.

The bidding exercise showed that **all label frames led to an increase in average bids for more energy efficient products** and these findings are statistically significant. This shows that the use of energy labels can positively impact consumer choice and increase the price consumers are willing to pay for more energy efficient products. However, the bidding exercise does not provide any clear indication as to which labelling frames perform better in terms of the price consumers may be willing to pay for more energy efficient products.

The choice experiment provides a somewhat clearer picture. Again we find that all labelling frames perform well in terms of the proportion of respondents choosing the higher priced more energy efficient product. Across frames the **closed numeric with the best available technology marker performed least well across all products**. Supporting the previous finding that respondents understanding of this frame was lower than the other frames.

Overall the observations from the experiments indicate the following:

- Respondents took into account energy labels when making their choices in the experiment, and were willing to pay more for a more energy efficient product.
- The best performing label frame was the alphabetic closed scale with the greatest proportion of respondents willing to pay a higher price, at all price levels, for the more energy efficient product when affixed with this label. Understanding was also very high for this frame.
- The label frame that performed least well in terms of willingness to pay was the benchmark marker. Understanding was also relatively low for this frame. It is not clear what is driving this result; however, it may be because respondents are using the colour coding scale to make their choices and not incorporating the additional information provided by the benchmark maker. It should also be noted, that previous studies in the United States have provided mixed results on consumer understanding and use of benchmarks, and suggest that where benchmarks are used clear wording should be added to indicate 'best' technology.²⁰
- The numeric closed, numeric open and reverse numeric performed similarly in terms of willingness to pay. However, the open numeric was less well understood than the numeric closed and reverse numeric scales.

²⁰ Egan (2000) and US Environmental Protection Agency (2010).

6.1 Recommendations for next testing phase

Four different label designs will be tested in the next phase of the study. Here we provide some recommendations based on observations from the online experiment as to which frames to take to the next testing phase.

The online experiment shows that understanding and performance of the closed numeric with benchmark marker is lower than the other labelling frames. It is unclear at this stage why this may be the case. Therefore, it may be interesting to test this framing in the field setting.

The alphabetic closed scale framing performs the best and as such we may want to introduce this again as a benchmark. However, this would only be recommended if it is foreseen that the EU energy label in the future could include a closed alphabetic scale.

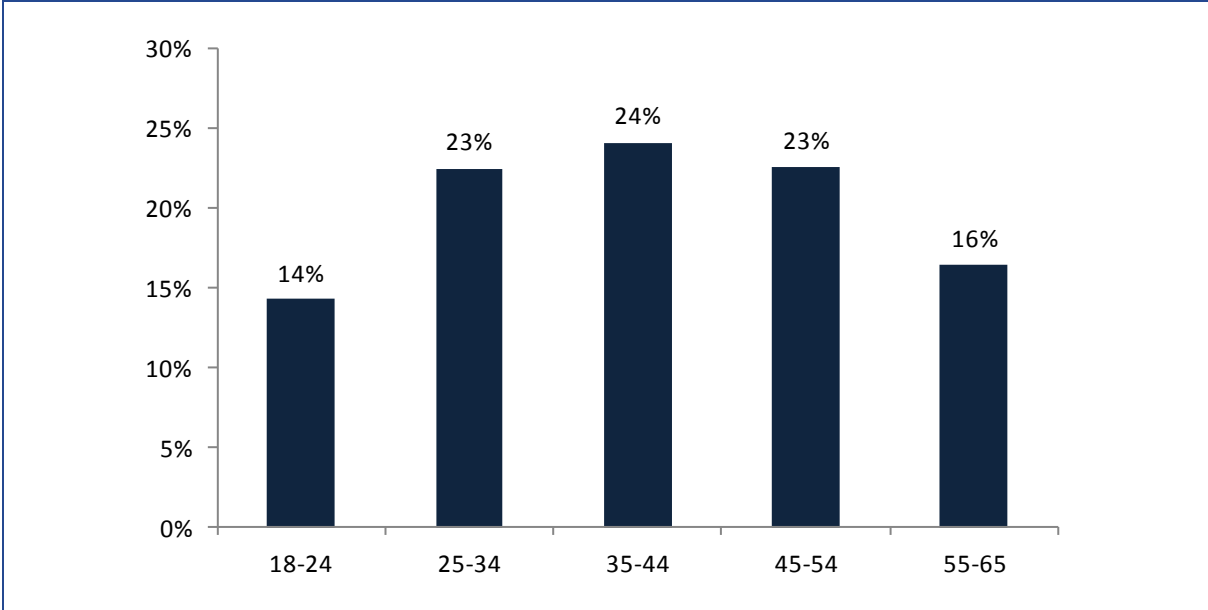
It would be interesting to test the open ended scale to assess consumers' behaviour and understanding of this framing in the field as this framing facilitates development in future technology. Similarly we may want to test the reverse numeric scale to compare which frame is better understood and impacts upon behaviour as both methods can be used to indicate improvement in technology.

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Annex 1 Socio-demographics

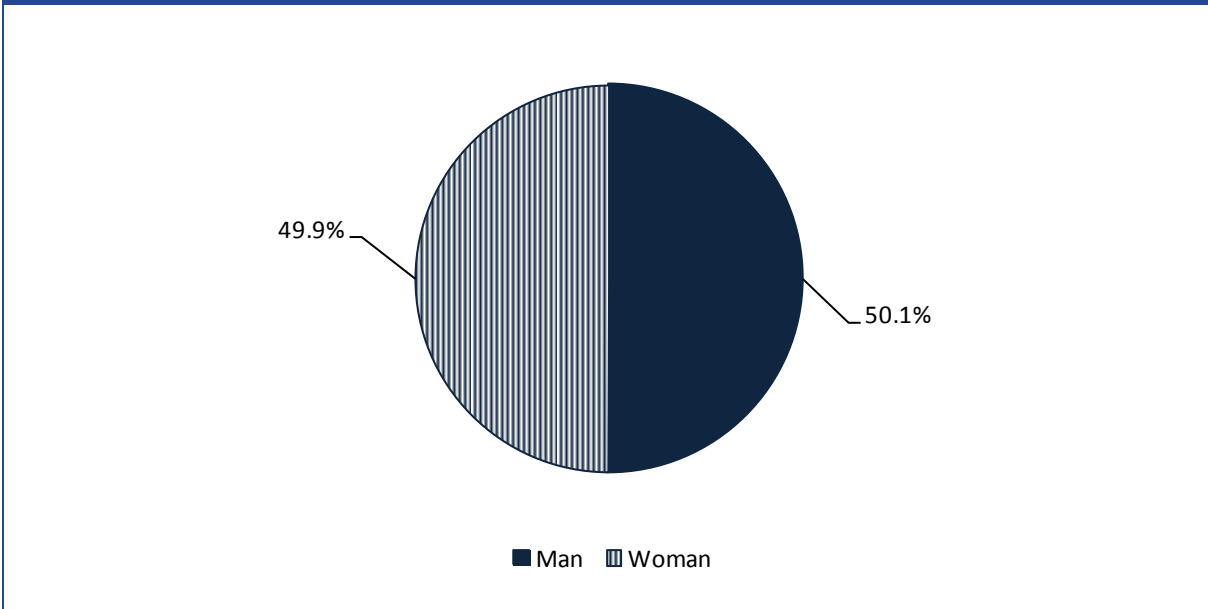
Figure 15: Age



Note: Total participants – 5012

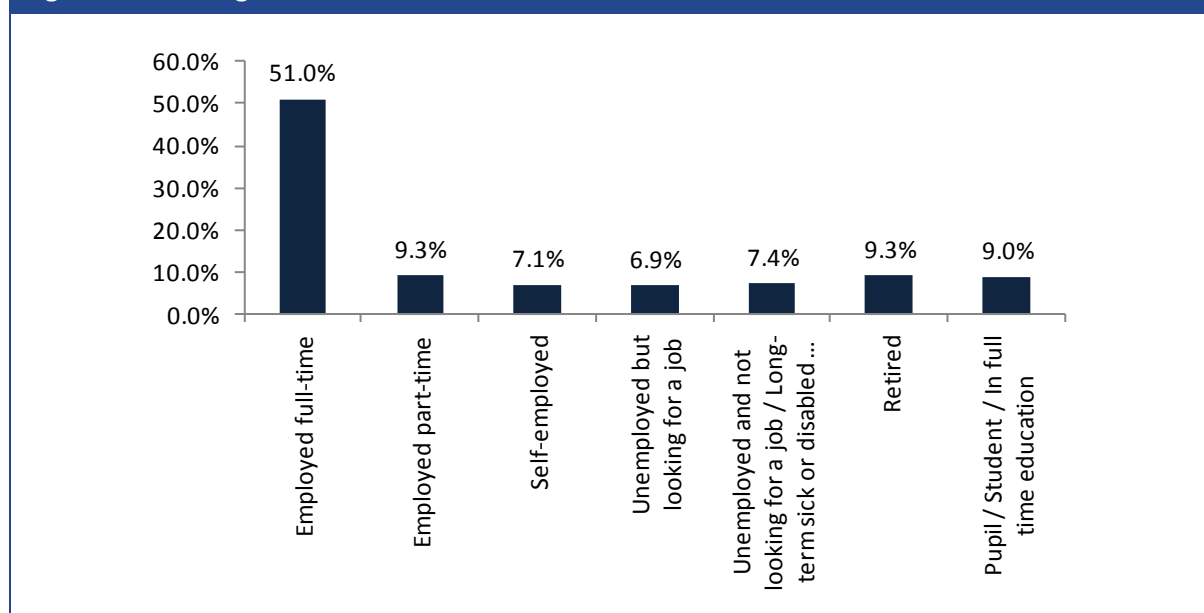
Source: Behavioural experiment

Figure 16: Gender



Note: Total participants – 5012

Source: Behavioural experiment

Figure 17: Working status

Note: Total participants – 5012

Source: *Behavioural experiment*

Annex 2 Previous purchasing behaviour and experience of energy labels

We asked participants in the behavioural experiment about their previous purchasing behaviour and their experience with energy labels. This section details the responses to these questions. This information has also been used in the report to determine whether any of these factors may have influenced the behaviour of participants in the behavioural experiment.

Figure 18:Q1A. Before this survey had you ever seen the following type of label [current EU energy label] on washing machines?

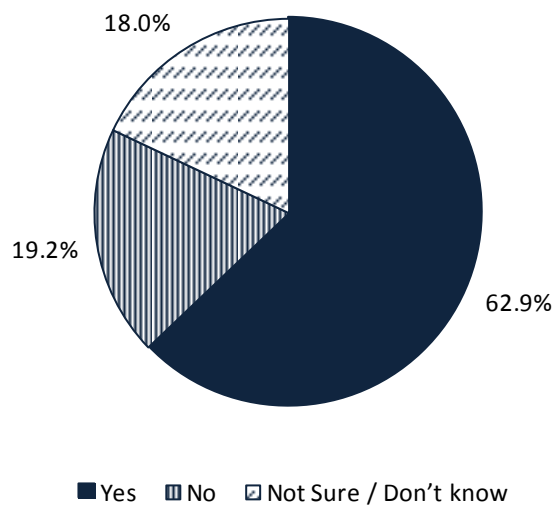


Figure 19:Q1B. Before this survey had you ever seen the following type of label [current EU energy label] on televisions?

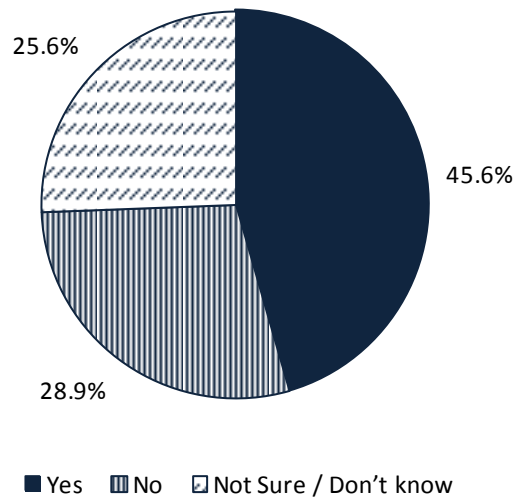


Figure 20:Q1C. Before this survey had you ever seen the following type of label [current EU energy label] on light bulbs?

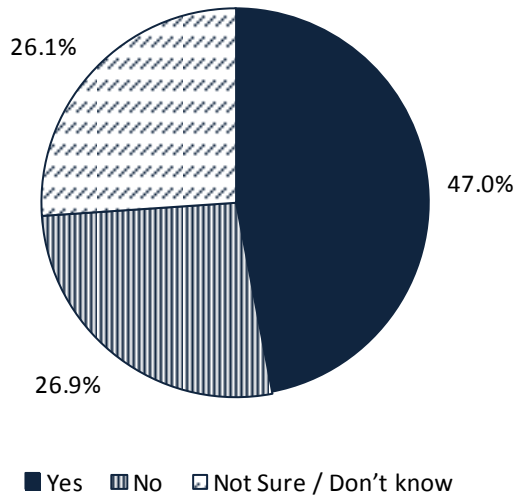


Figure 21:Q1ABC. Proportion fo respondents whi had seen the current Eu energy label label on any of the three products

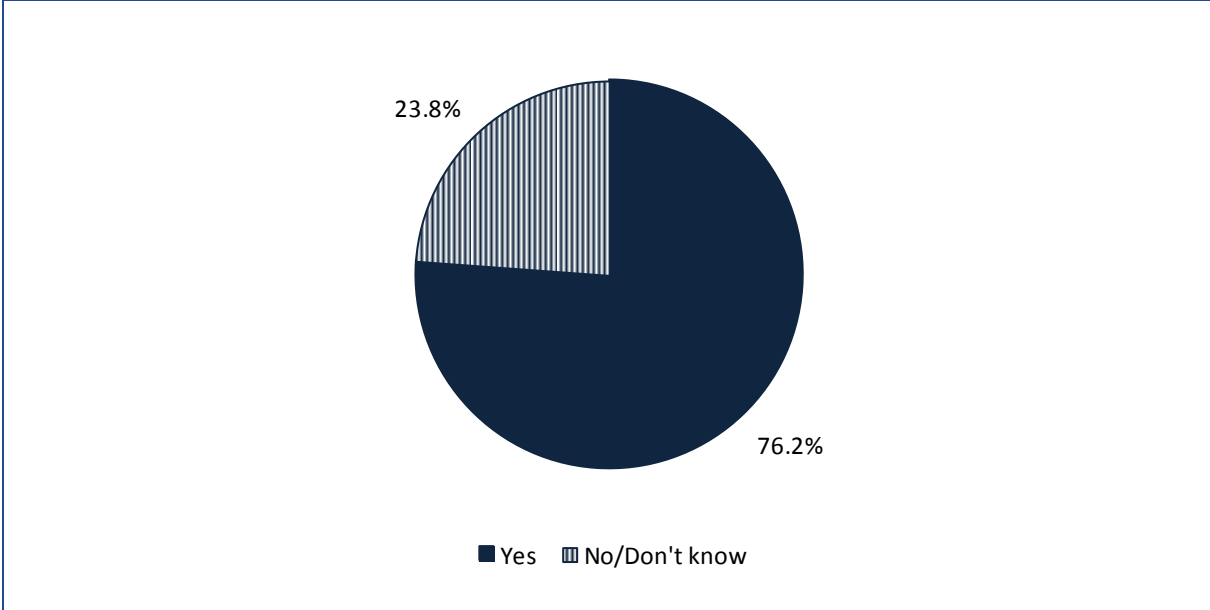


Figure 22:Q2. Which of the following products have you bought in the last 24 months?

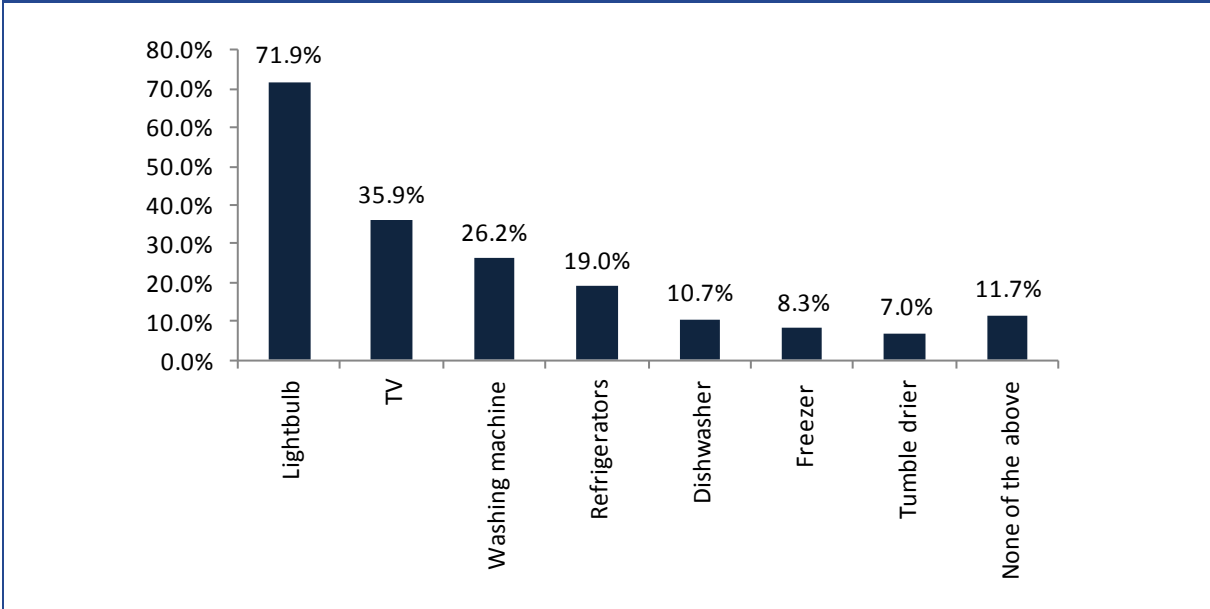


Figure 23:Q3. When buying the following product(s), which of the following did you take into consideration?

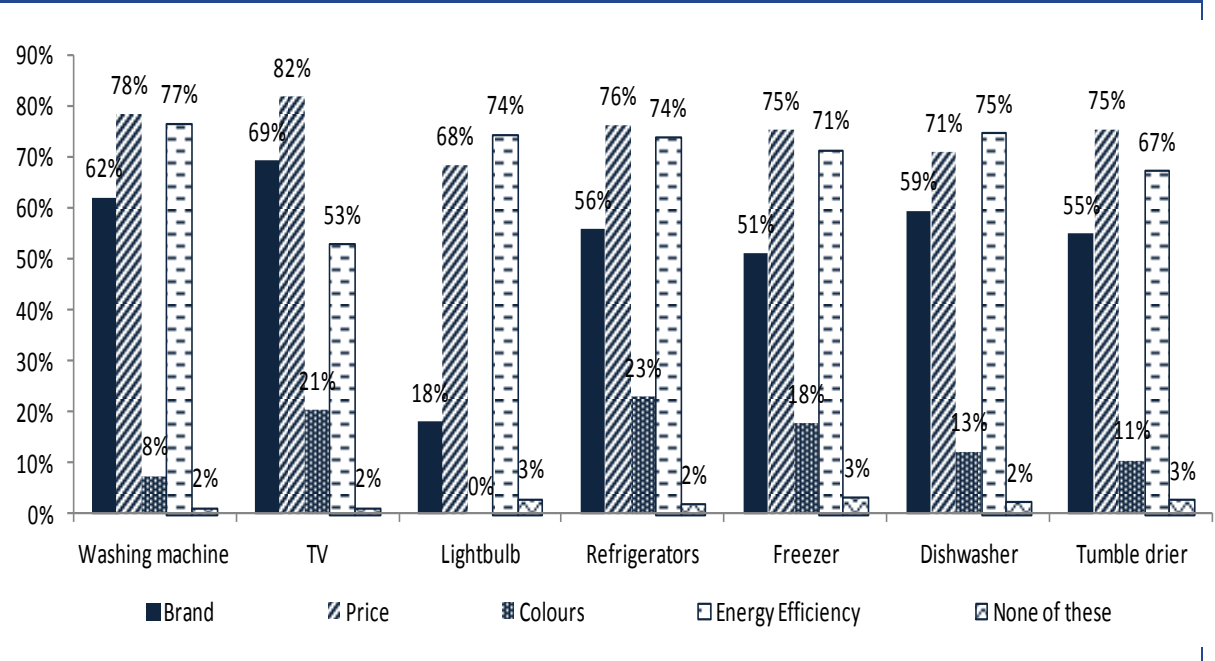


Figure 24:Q4. And which of the following was the most important when buying the following product(s)?

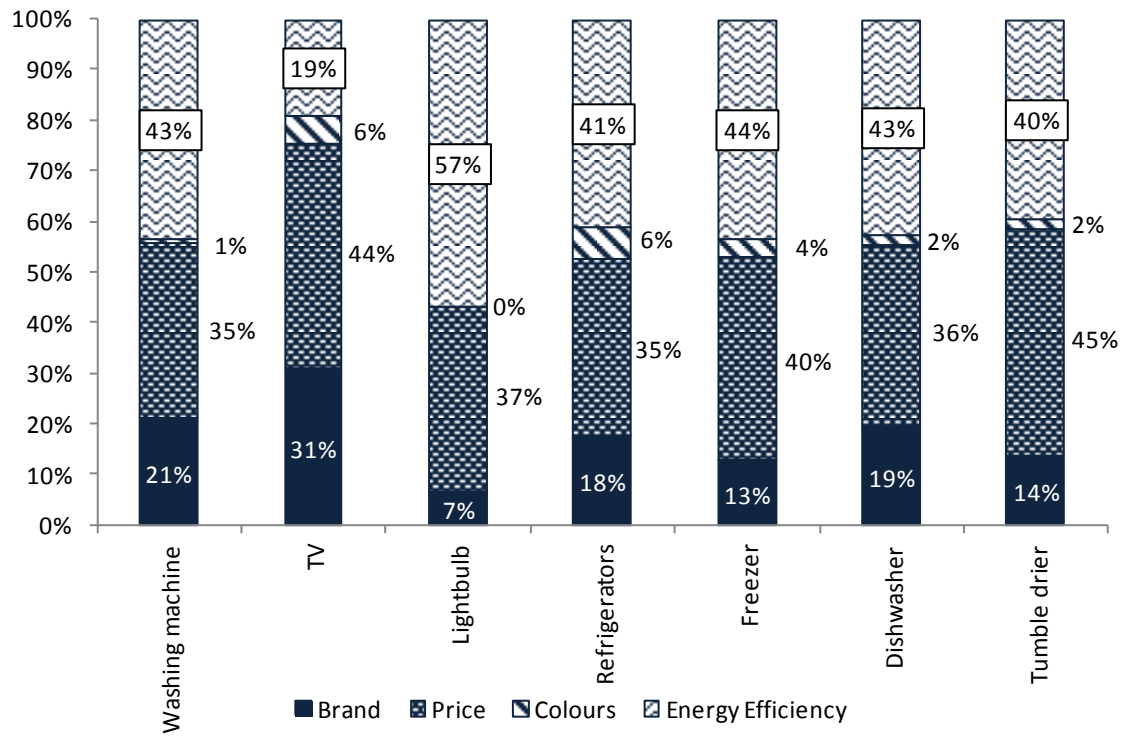
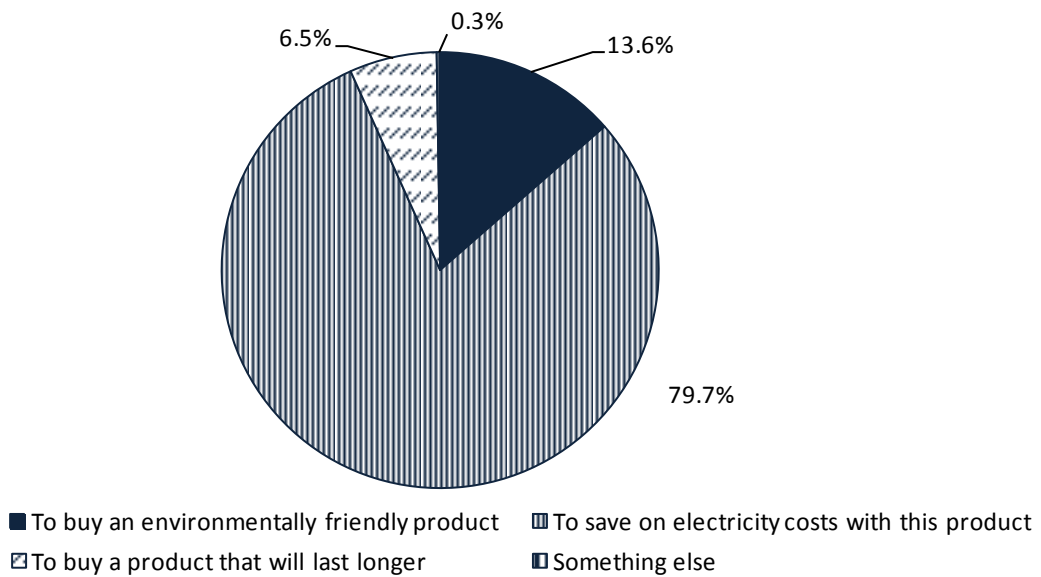


Figure 25:Q5. You said you took energy efficiency into account when buying your household appliance(s). What was the main reason you considered energy efficiency?



Annex 3 Questionnaire and experiment code

STANDARD PANEL INTRO

Thank you for your participation in our Ipsos Access Panels online surveys. Your opinions are very important to us.

This survey will take you about 20 minutes and you'll earn up to XX reward points upon completing it.

It is very important that xxxxx completes the survey. If that person is not you please do not answer the survey in his/her name.

PROG : **HIDDEN** **VARIABLES**

Qcountry:

1. Czech Republic
2. France
3. Great Britain
4. Italy
5. Norway
6. Poland
7. Romania

Qlanguage:

1. Czech
2. French
3. English
4. Italian
5. Norwegian
6. Polish
7. Romanian

QSAMPLE

1. Ipsos panel
2. External panel

PROG: QINCENTIVE= CODE 1 (POINTS) FOR ALL EXCEPT FOR [QCOUNTRY= CODE 1 AND QSAMPLE= CODE 1 (Czech Republic Ipsos panel)] OR FOR [Q_COUNTRY= CODE 5 AND QSAMPLE= CODE 1 (Norway Ipsos panel)] PROG : INCENTIVE = CODE 2 (VOUCHER) .

QINCENTIVE .

1. POINTS
2. VOUCHER

INTRO SCREEN

Thank you for taking part in this important study for the European Commission. The survey is about energy labels and will ask you to compare different household products and to consider which ones you would choose to buy and how much you would be willing to pay.

This survey includes some exercises where you will be asked to make 'virtual' purchases and go through a specific purchase process. These exercises will not actually involve purchasing real goods or services, nor will you be asked to provide any form of payment.

PRG: IF QINCENTIVE =1 (point) SHOW:
In these exercises you will have a chance to win extra survey points. You will receive your survey points for participating in the survey as usual after completing it. Any additional points you may win in the exercises will be added to your account after the survey closes. It can take up to 8 weeks for you to receive your additional points.

PRG: IF QINCENTIVE =2 (Voucher) SHOW:
In these experiments you will have a chance to win 'Survey points'. At the end of the survey your 'Survey points' will be redeemed for a voucher of a value that will depend on the number of points you would have won. The value of the voucher corresponds to the following number of points:

PRG: QCOUNTRY= CODE 1 AND QSAMPLE= CODE 1 (CZ Ipsos panel) SHOW:

- 0-100 points= 100 Kč Ticket Compliments Darkový voucher
- 101-200 points= 200 Kč Ticket Compliments Darkový voucher
- More than 200 points = 300Kč Ticket Compliments Darkový voucher

PRG: QCOUNTRY= CODE 5 AND QSAMPLE= CODE 1 (NORWAY Ipsos panel) SHOW:

- 0-100points= 100 NOK Supergavekortet voucher
- 101-200 points= 200 NOK Supergavekortet voucher
- More than 200 points = 300 NOK Supergavekortet voucher

You will still enter the standard quarterly IIS prize draw for participating in the survey. But in addition, you will receive a voucher corresponding to the number of points you won in the survey. It can take up to 8 weeks for you to receive this voucher.

SCREENING QUESTIONS

Firstly please tell us a few details about yourself. This is to ensure we are including a wide range of people in this research.

PROG: ASK ALL UNLESS SPECIFIED

D1. How old were you at your last birthday?
Please enter your age - PRG: NUMERIC QUESTION – RANGE 1 – 99 – SCREEN OUT IF LESS THAN 18 OR OVER 65;

RECODE INTO:

- 1) 18 - 24
- 2) 25 - 34
- 3) 35 - 44
- 4) 45 - 54
- 5) 55 - 65

D2. Are you a...

Please select one answer - PRG: SINGLE ANSWER

- 1. Man
- 2. Woman

D3. REGION **PRG: USE STANDARD REGION QUESTION FROM PANEL**

D4. Which of the following best describes your current work status?
Please select one answer - PRG: SINGLE ANSWER

	PRG: RECODE AS
1. Employed full-time	1. ACTIVE
2. Employed part-time	
3. Self-employed	
4. Unemployed but looking for a job	
5. Unemployed and not looking for a job / Long-term sick or disabled / Housewife / Househusband	2. INACTIVE

6. Retired	
7. Pupil / Student / In full time education	

INTRO EXPERIMENTS

PRG: SPLIT ALL RESPONDENTS INTO 5 GROUPS. THESE GROUPS WILL BE HELD CONSTANT THROUGHOUT SURVEY. EACH GROUP CORRESPONDS TO ONE LABEL TREATMENT. RESPONDENTS WILL BE ALWAYS BE SHOWN THE SAME LABEL TREATMENT THROUGH MODULE 1 AND 2.

PRG: SHOW FOR TESTING PURPOSE

Qtreatment

1. Treatment 1
2. Treatment 2
3. Treatment 3
4. Treatment 4
5. Treatment 5

You will now take part in two exercises where you will be asked to compare different household products and to consider which ones you would choose to buy and how much you would be willing to pay.

Before you move on to these exercises please read the following information. This explains the energy efficiency label that will be shown to you in the exercises.

PRG: SHOW LABEL TREATMENT EXPLANATION SCREENS CORRESPONDING TO GROUP OF RESPONDENTS. REFER TO POWER POINT file 'LABEL TREATMENT EXPLANATIONS'.

EXPLANATION to LABEL TREATMENT 1 TO GROUP 1

EXPLANATION to LABEL TREATMENT 2 TO GROUP 2

EXPLANATION to LABEL TREATMENT 3 TO GROUP 3

EXPLANATION to LABEL TREATMENT 4 TO GROUP 4

EXPLANATION to LABEL TREATMENT 5 TO GROUP 5

PRG: ROTATE 50% OF RESPONDENTS TO START WITH MODULE 1 AND 50% WITH MODULE 2.

MODULE 1: CHOICE EXPERIMENT

For this part of the survey we would like to find out which product you would choose to purchase. You will not actually be able to buy anything, but we would like you to imagine that you are currently shopping for the products you see on the screen.

You will always be offered a choice between two slightly different products and we want to find out which one of the two you prefer. The products only differ in terms of price and energy efficiency. There is no money at stake in this part of the experiment, so you can simply give your opinion about the two products offered.

Overall we are going to ask you to make 9 choices.

NEW SCREEN

PRG: THERE ARE 540 COMBINATIONS (6 PRICE COMBINATIONS X 6 RATINGS X 5 TREATMENTS X 3 PRODUCTS) PLEASE REFER TO CHOICE EXPERIMENT EXCEL FILE 'MATRIX OF CHOICE EXPERIMENT'.

PRG: RANDOMLY ALLOCATE NINE COMBINATIONS PER RESPONDENT.

PRG: CAN NOT SHOW TWICE THE SAME RATING COMBINATION FOR THE SAME PRODUCT.

PRG: EACH RESPONDENT SHOULD SEE 3 COMBINATIONS FOR EACH PRODUCT (WASHING MACHINE, TV, LIGHT BULB)

THE PRODUCT TYPES NEED TO BE HELD TOGETHER I.E. 3 WASHING MACHINES SHOWN IN A ROW, 3 LIGHTBULBS SHOWN IN A ROW.

THE PRODUCT TYPES SHOULD BE ROTATED I.E. SOME SEE 3 WASHING MACHINES, THEN 3 TELEVISIONS, THEN 3 LIGHTBULBS, OTHERS SEE 3 TELEVISIONS, THEN 3 LIGHTBULBS, THEN 3 WASHING MACHINES ETC.

PRG: RESPONDENTS SHOULD ONLY BE SHOWN COMBINATIONS OF LABELS CORRESPONDING TO THE TREATMENT OF THEIR GROUP (GROUP 1 = TREATMENT 1 ETC..)





PRG: EACH COMBINATION SHOULD BE SHOWN THE SAME NUMBER OF TIMES IN EACH COUNTRY

PRG: FOR TESTING PURPOSE SHOW LIST OF COMBINATIONS TO CHOOSE FROM

PRG: SHOW THE QUESTION FOR EACH COMBINATION

C1 - C9. Please indicate which of the two products shown below you would be most likely to purchase. PRG: SINGLE ANSWER

PRG: EXAMPLE OF SCREEN TO BE SHOWN ONLY THE LABEL AND THE PRICE WILL VARY - PLEASE REFER TO POWER POINT FILE 'EXPERIMENT LABELS'

 <p>Spin speed: 1400rpm Wash load: 7kg Price: £369</p>	 <p>Spin speed: 1400rpm Wash load: 7kg Price: £335</p>
	

PRG: SHOW COMBINATION – ROTATE COMBINATIONS ON LEFT AND RIGHT SIDE OF SCREEN
PRG: REPEAT NINE TIMES

PRG: ROTATE 50% OF RESPONDENTS TO START WITH MODULE 1 AND 50% WITH MODULE 2.

MODULE 2: MULTIPLE PERIOD AUCTION EXPERIMENT

INSTRUCTION PAGE

This section of the survey will ask you to complete an exercise that is different to standard survey questions. It is essential that you read the instructions carefully to understand how to complete the exercise.

PRG: BRING UP A WARNING MESSAGE SAYING “Please ensure you read these instructions in full before moving on” IF THEY TRY TO CLICK THROUGH TO THE NEXT PAGE WITHIN 30SECONDS

You are now going to be shown a range of washing machines, televisions and light bulbs. You will be asked how much you would be prepared to offer for each product if it was on sale at an auction. This will be your ‘bid’.

This is a hypothetical auction so you will not receive real products or pay with real money. You are also not bidding against other people.

PRG: ALL COUNTRIES EXCEPT QCOUNTRY= CODE 1 OR CODE 5 AND QSAMPLE= CODE 1 This is in addition to the points you will receive for taking part in this survey.

PRG: [QCOUNTRY= CODE 1 OR CODE 5 AND QSAMPLE= CODE 1 (Czech Republic AND NORWAY Ipsos panel)] At the end of the survey, your 'Survey points' will be redeemed for a voucher of a value that will depend on the number of points you won. The value of the voucher corresponds to the following number of points:

PRG: QCOUNTRY= CODE 1 AND QSAMPLE= CODE 1 (CZ Ipsos panel) SHOW:

- 0-100 points= 100 Kč Ticket Compliments Darkový voucher
- 101-200 points= 200 Kč Ticket Compliments Darkový voucher
- More than 200 points = 300Kč Ticket Compliments Darkový voucher

PRG: QCOUNTRY= CODE 5 AND QSAMPLE= CODE 1 (NORWAY Ipsos panel) SHOW:

- 0-100points= 100 NOK Supergavekortet voucher
- 101-200 points= 200 NOK Supergavekortet voucher
- More than 200 points = 300 NOK Supergavekortet voucher

You will still enter the standard quarterly IIS prize draw for participating in the survey. But in addition, you will receive a voucher corresponding to the number of points you would have won in the survey. It can take up to 8 weeks for you to receive this voucher.

Please read the following instructions carefully.

- You will be given a small amount of 'money' at the start of each bid. This will be called an endowment. The bids you make will determine how much of this endowment you receive in survey points at the end of the exercise.
- You will be told the re-sale value of the product i.e. how much you could get for the product if you re-sold it.
- You will be asked to state how much you would offer for the product (your 'bid'). You are free to bid any amount.
- You will not be told the exact sale price of the product before you make your bid, but you will be told the price range for the product.
- If the amount you bid for the product is above the actual sale price, you will 'win' the product.
- If the amount you bid is below the sale price you will not win the product.
- For each product that you win, you may receive additional survey points. The number of points you win will be calculated from the difference between the re-sale value and the sale price of the product plus your endowment money.
- If you win a product with a higher sale price than its re-sale value, you will lose money from your endowment.
- **PRG: ALL COUNTRIES EXCEPT QCOUNTRY= CODE 1 OR CODE 5 AND QSAMPLE= CODE 1** During this exercise you may lose some or all of the endowment but you will always receive your initial survey points for taking part in the survey.

PRG: [QCOUNTRY= CODE 1 OR CODE 5 AND QSAMPLE= CODE 1 (Czech Republic AND NORWAY Ipsos panel)]

- During this exercise you may lose some or all of the endowment. If you do not win any survey point you will not receive any voucher however you will still enter the standard quarterly IIS prize draw for participating in the survey.
- **PRG: TO ALL:** If you win products that are energy efficient then Ipsos will make a financial donation to a fund designed to protect the environment.

Next you will see a few examples to show you how it works

4) **PRG: SHOW LINK TO TERMS AND CONDITIONS**

NEXT SCREEN

PRG: BRING UP A WARNING MESSAGE SAYING “Please ensure you read these instructions in full before moving on” **IF THEY TRY TO CLICK THROUGH TO THE NEXT PAGE WITHIN 15 SECONDS**

PGR: REFER TO ‘BDM’ EXCEL FILE FOR INSERTION OF VALUES

PRG: FOR TESTING PURPOSE SHOW LIST OF COMBINATIONS AND PRICE LIST TO CHOOSE FROM

Example 1: You win the product and win additional survey points

PRG: INSERT VALUES FROM EXAMPLE 1 TABLE OF BDM EXCEL FILE

- You are given an endowment of **[PRG: INSERT ENDOWMENT]**. You are told that the re-sale value of a washing machine is **[PRG: INSERT RESALE VALUE]**. You are told the sale price range is between **[PRG: INSERT MINIMUM RANGE]** and **[PRG: INSERT MAXIMUM RANGE]**.
- You decide to bid **[PRG: INSERT BID]**.
- The sale price for the washing machine is actually **[PRG: INSERT SALE PRICE]**
- You win the product as you were willing to offer more for the washing machine than the sale price. For this bid you would win **[PRG: INSERT WIN]** (re-sale price of **[PRG: INSERT RESALE VALUE]** minus sale price of **[PRG: INSERT SALE PRICE]** plus **[PRG: INSERT ENDOWMENT]** endowment). This is converted into **[PRG: INSERT WIN IN POINTS]** additional survey points.

Example 2: You win the product but lose some of your endowment

PRG: INSERT VALUES FROM EXAMPLE 2 TABLE OF BDM EXCEL FILE

- You are given an endowment of [PRG: INSERT ENDOWMENT]. You are told that the re-sale value of a washing machine is [PRG: INSERT RESALE VALUE]. You are told the sale price range is between [PRG: INSERT MINIMUM RANGE] and [PRG: INSERT MAXIMUM RANGE].
- You decide to bid [PRG: INSERT BID].
- The sale price for the washing machine is actually [PRG: INSERT SALE PRICE].
- You win the product as you were willing to offer more for the washing machine than the sale price. For this bid you lose [PRG: INSERT LOSE] from your endowment (re-sale price of [PRG: INSERT RESALE VALUE] minus sale price of [PRG: INSERT SALE PRICE]). You are left with [PRG: INSERT WIN] from your endowment. This is converted into [PRG: INSERT WIN IN POINTS] additional survey points. The product you won was energy efficient so a financial donation is made by Ipsos to a fund designed to protect the environment.

Example 3: You do not win the product and do not win any additional survey points

PRG: INSERT VALUES FROM TABLE EXAMPLE 3 OF BDM EXCEL FILE

- You are given an endowment of [PRG: INSERT ENDOWMENT]. You are told that the re-sale value of a washing machine is [PRG: INSERT RESALE VALUE]. You are told the sale price range is between [PRG: INSERT MINIMUM RANGE] and [PRG: INSERT MAXIMUM RANGE].
- You decide to bid [PRG: INSERT BID].
- The sale price for the washing machine is actually [PRG: INSERT SALE PRICE].
- You do not win the product as you were not willing to offer more for the washing machine than the sale price.
- You keep your endowment of [PRG: INSERT ENDOWMENT] which is converted into [PRG: INSERT WIN IN POINTS] additional survey points.

NEXT SCREEN

PRACTICE1: WASHING MACHINE

This is a practice go before the real survey starts. This will not affect how many additional survey points you win. Please refer back to the instructions if you need to by clicking here. [PRG: INSERT LINK TO BRING UP INSTRUCTION PAGE]

Please look at the information provided about this washing machine. Imagine that you have been given an endowment of [PRG: INSERT ENDOWMENT FOR WASHING MACHINE].

Please state how much you would offer for this product. You are free to bid any amount that you would be prepared to pay for this product.

PRG: SHOW PRODUCT SCREEN –

EXAMPLE SCREEN – REFER TO BDM EXCEL FILE FOR LABEL AND RESALE VALUE TO INSERT.

PGR: INSERT LABEL TREATMENT CORRESPONDING TO RESPONDENT GROUP

PRG: CHOOSE A RATING RANDOMLY FROM THOSE AVAILABLE FOR THIS TREATMENT AND THIS PRODUCT – SEE TABLE RATING COMBINATION BDM EXCEL FILE –

PRG: THE LABELS NEED TO BE RANDOMISED SO THAT THEY APPEAR AN EQUAL NUMBER OF TIMES IN EACH COUNTRY.

Washing Machine



Spin speed: 1400rpm

Wash load: 7kg

Sale price range: [PRG: ENTER MINIMUM PRICE RANGE] - [PRG: ENTER MAXIMUM PRICE RANGE]

Resale value: [PRG: INSERT RESALE VALUE]

PRG :
INSERT
LABEL AND
RATING

P1. Please enter your bid for this product: [PRG: NUMERIC QUESTION – ALLOW ONLY SALE PRICE RANGE OF THE PRODUCT INDICATED ABOVE] *Please insert amount []* PRG: INSERT CURRENCY SYMBOL BEFORE PRICE FOR UK, AFTER PRICE FOR OTHER COUNTRIES.

NEXT SCREEN

The sale price for this product was actually [PRG: RANDOMLY SELECT SALE PRICE BELOW RESALE VALUE FROM PRICE LIST OF EXECL FILE]. Your bid was [PRG: ENTER BID VALUE FROM P1].

PRG: IF BID VALUE IS HIGHER THAN SALE PRICE This means you have won this product as your bid was higher than the sale price.

PRG: IF BID EQUAL SALE PRICE: This means you have won this product as your bid was equal to the sale price.

PRG: IF WON PRODUCT: As this was a practice bid you have not won any additional survey points. However, if this was the real survey you would have won [PRG: INSERT AMOUNT WON FROM CALCULATION= RESALE VALUE MINUS SALE PRICE PLUS ENDOWMENT] which would convert into

[PRG: CONVERT WIN AMOUNT INTO POINTS FOLLOWING 'CONVERSION' TABLE FROM BDM EXCEL FILE] survey points.

You would have won [PRG: INSERT AMOUNT WON FROM CALCULATION ABOVE] as the resale price of [PRG: INSERT RESALE PRICE FOR WASHING MACHINE] minus the product price of [PRG: INSERT RANDOMLY GENERATE SALE PRICE FROM ABOVE], plus your endowment of [PRG: INSERT ENDOWMENT FOR WASHING MACHINE] equal [INSERT AMOUNT WON].

PRG: IF RESPONDENT HAS WON ON PRODUCTS FROM TABLE 6 OF BDM FILE (product generating a donation) THEN SHOW: You won the energy efficient product so in the real survey a financial contribution would have been made by Ipsos to a fund designed to protect the environment.

PRG: IF BID VALUE IS LOWER THAN SALE PRICE This means you have not won this product as your bid was lower than the sale price. You keep your endowment of [PRG: INSERT ENDOWMENT] which is converted into [PRG: INSERT WIN IN POINTS] additional survey points.

PRACTICE 2

This is another practice go before the real survey starts. This will not affect how many additional survey points you win. Please refer back to the instructions if you need to by clicking here. [PRG: INSERT LINK TO BRING UP INSTRUCTION PAGE]

Please look at the information provided about this television. Imagine that you have been given an endowment of [PRG: INSERT ENDOWMENT FOR TV].

PRG: SHOW PRODUCT SCREEN

P2. Please enter your bid for this product: [PRG: NUMERIC QUESTION – ALLOW ONLY SALE PRICE RANGE OF THE PRODUCT INDICATED ABOVE] *Please insert amount []* PRG: INSERT CURRENCY SYMBOL BEFORE PRICE FOR UK, AFTER PRICE FOR OTHER COUNTRIES

NEXT SCREEN

The sale price for this product was actually [PRG: RANDOMLY SELECT SALE PRICE **HIGHER THAN THE RESALE VALUE FROM PRICE LIST OF EXECL FILE**]. Your bid was [PRG: ENTER BID VALUE FROM P2].

PRG: IF BID VALUE IS HIGHER THAN SALE PRICE This means you have won this product as your bid was higher than the sale price.

PRG: IF BID EQUAL SALE PRICE: This means you have won this product as your bid was equal to the sale price.

PRG: SHOW BELOW TEXT AS WON PRODUCT BUT SALE PRICE HIGHER THAN RE-SALE VALUE (I.E. VALUE OF BID WAS HIGHER THAN SALE PRICE BUT SALE PRICE HIGHER THAN RE-SALE VALUE):

As the sale price for the product is higher than the re-sale value, [PRG: INSERT SALE PRICE MINUS RE-SALE VALUE] will be taken away from your [PRG: INSERT ENDOWMENT AMOUNT] endowment. This leaves you with [PRG: INSERT ENDOWMENT MINUS LOSS] from your endowment which will be converted into [PRG: CONVERT WIN AMOUNT INTO POINTS FOLLOWING 'CONVERSION' TABLE FROM BDM EXCEL FILE] survey points.

PRG IF WINNINGS ARE 0 POINT - This leaves you with [PRG: INSERT 0 with RELEVANT CURRENCY] from your endowment which will not be converted into any additional survey points.

PRG: IF RESPONDENT HAS WON ON PRODUCTS FROM TABLE 6 OB BDM FILE (product generating a donation) THEN SHOW: You won the energy efficient product so in the real survey a financial contribution would have been made by Ipsos to a fund designed to protect the environment.

PRG: IF BID VALUE IS LOWER THAN SALE PRICE This means you have not won this product as your bid was lower than the sale price. You keep your endowment of [PRG: INSERT ENDOWMENT] which is converted into [PRG: INSERT WIN IN POINTS] additional survey points.

NEXT SCREEN

This is now the real survey and you may win additional points depending on the bids you make. You may also make choices which lead to financial donations being made by Ipsos to a fund designed to protect the environment.

PRG: ONLY INCLUDE ON FIRST REAL BID SCREEN: You will be asked to make nine bids in total. There will be three bids for washing machines, three bids for televisions and three bids for light bulbs. Please refer back to the instructions if you need to by clicking [here](#). [PRG: INSERT LINK TO BRING UP INSTRUCTION PAGE]

Please look at the information provided about this [PRG: INSERT PRODUCT NAME]

You have been given an endowment of [PRG: INSERT ENDOWMENT VALUE]

EXAMPLE SCREEN – REFER TO BDM EXCEL FILE FOR LABEL AND RESALE VALUE TO INSERT.

PGR: INSERT LABEL TREATMENT CORRESPONDING TO RESPONDENT GROUP

PRG: CHOOSE A RATING COMBINATION RANDOMLY FROM THOSE AVAILABLE FOR THIS TREATMENT AND THIS PRODUCT – SEE TABLE RATING COMBINATION BDM EXCEL FILE –

PRG: EACH RATING COMBINATION NEEDS TO APPEAR AN EQUAL NUMBER OF TIMES IN EACH COUNTRY.

PRG: EACH SALE PRICE SHOULD BE SEEN THE SAME NUMBER OF TIMES

PRG: RESPONDENT SHOULD SEE DIFFERENT SALE PRICE EACH TIME

EXAMPLE SCREEN

Washing Machine



PRG :
INSERT
LABEL AND
RATING

Spin speed: 1400rpm

Wash load: 7kg

Sale price range: [PRG: ENTER MINIMUM PRICE RANGE] - [PRG: ENTER MAXIMUM PRICE RANGE]

Resale value: [PRG: INSERT RESALE VALUE]

B1-B9 Please enter your bid for this product: [PRG: NUMERIC QUESTION – ALLOW ONLY SALE PRICE RANGE OF THE PRODUCT INDICATED ABOVE] *Please insert amount []* PRG: INSERT CURRENCY SYMBOL BEFORE PRICE FOR UK, AFTER PRICE FOR OTHER COUNTRIES

NEXT SCREEN

The sale price for this product was actually [PRG: RANDOMLY GENERATE SALE PRICE BETWEEN MINIMUM AND MAXIMUM RANGE FOR PRODUCT FROM PRICE LIST OF EXCEL FILE]. Your bid was [PRG: ENTER BID VALUE FROM B1-B9].

PRG: IF BID VALUE IS HIGHER THAN SALE PRICE. This means you have won this product as your bid was higher than the sale price.

PRG: IF BID EQUAL SALE PRICE: This means you have won this product as your bid was equal to the sale price.

PRG: IF WON PRODUCT AND SALE PRICE LOWER THAN OR EQUAL TO RESALE VALUE You have won [PRG: INSERT AMOUNT WON FROM CALCULATION= RESALE VALUE MINUS SALE PRICE PLUS ENDOWMENT] which would convert into [PRG: CONVERT WIN AMOUNT INTO POINTS FOLLOWING 'CONVERSION' TABLE FROM BDM EXCEL FILE] survey points.

PRG: IF WON PRODUCT AND SALE PRICE HIGHER THAN RE-SALE VALUE As the sale price for the product is higher than the re-sale value, [PRG: INSERT SALE PRICE MINUS RE-SALE VALUE] will be taken away from your [PRG: INSERT ENDOWMENT AMOUNT] endowment. This leaves you with [PRG: INSERT ENDOWMENT MINUS LOSS] from your endowment which will be converted into an additional [PRG: INSERT CONVERSION CALCULATION] Survey points. [PRG IF WINNINGS ARE 0 POINT - This leaves you with [PRG: INSERT 0 with RELEVANT CURRENCY] from your endowment which will not be converted into any additional survey points.

PRG: IF RESPONDENT HAS WON ON PRODUCTS FROM TABLE 6 OF BDM FILE (product generating a donation) THEN SHOW: You won the energy efficient product so a financial contribution-will be made by Ipsos to a fund designed to protect the environment.

PRG: IF BID VALUE IS LOWER THAN SALE PRICE This means you have not won this product as your bid was lower than the sale price. You keep your endowment of [PRG: INSERT ENDOWMENT] which is converted into [PRG: INSERT WIN IN POINTS] additional survey points.

PRG: REPEAT NINE TIMES - EACH RESPONDENT WILL BE SHOWN 3 DIFFERENT LABELS X 3 PRODUCTS I.E. 9 SCREENS IN TOTAL.

THE PRODUCT TYPES NEED TO BE HELD TOGETHER I.E. 3 WASHING MACHINES SHOWN IN A ROW, 3 LIGHTBULBS SHOWN IN A ROW.

THE PRODUCT TYPES SHOULD BE ROTATED I.E. SOME SEE 3 WASHING MACHINES, THEN 3 TELEVISIONS, THEN 3 LIGHTBULBS, OTHERS SEE 3 TELEVISIONS, THEN 3 LIGHTBULBS, THEN 3 WASHING MACHINES ETC.

NEXT SCREEN –

PRG: AT END OF NINE BIDS

You have now completed this section of the survey. The total value you have won is [PRG: INSERT TOTAL WON ACROSS NINE BIDS] For the purpose of this exercise, this will be converted into [PRG: INSERT POINTS CONVERSION] survey points.

IF WINNINGS ARE 0 POINTS – This will not be converted into any additional survey points.

MODULE 3: INTERPRETATION EXPERIMENT

The next question asks about your opinions and interpretations of potential energy labels you may see on household products.

You will see a selection of energy labels and these will be followed by a set of four possible answers. Please indicate the appropriate answer.

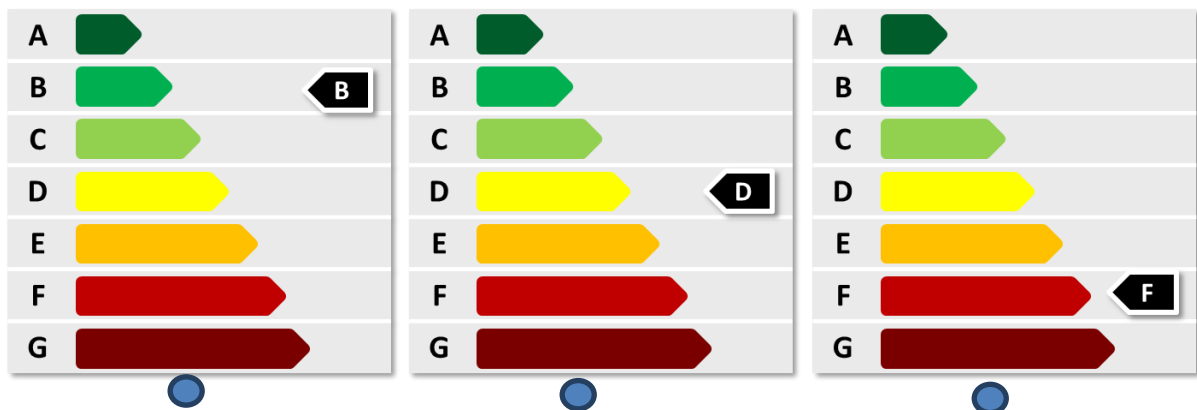
6.1.1 NEW SCREEN

PRG: ALL RESPONDENTS ANSWER ALL 5 QUESTIONS.

PRG: ROTATE ORDER OF THE 5 QUESTIONS

T1. Please select the product you think is the most energy efficient. PRG: SINGLE ANSWER

PRG: ROTATE ORDER OF PRODUCT ON SCREEN



PRG: CODE 1 = PRODUCT B

PRG: CODE 2 = PRODUCT D

PRG: CODE 3 = PRODUCT F

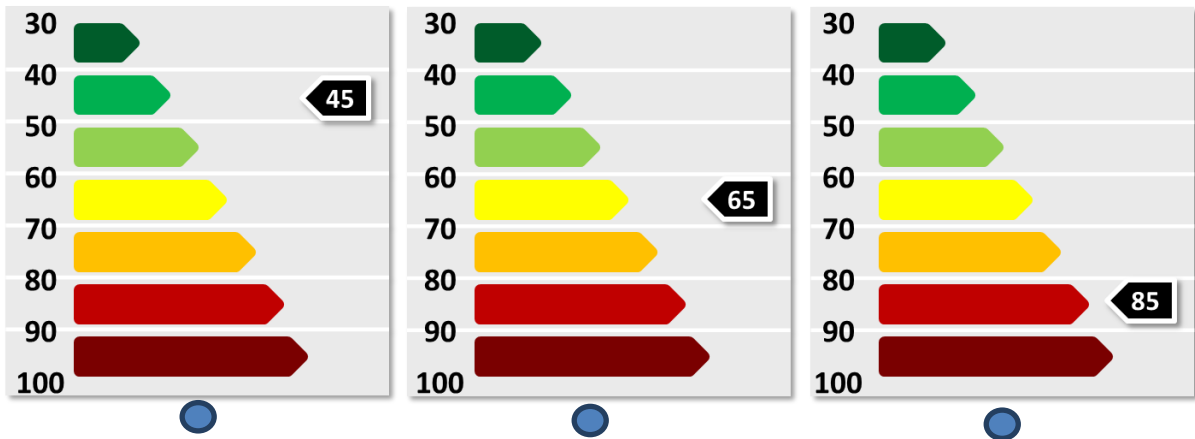
PRG: USE RADIO BUTTONS FOR CODE 1, 2, 3 – SHOW CODE 4 BELOW

4. I do not know

NEW SCREEN

T2. Please select the product you think is the most energy efficient. PRG: SINGLE ANSWER

PRG: ROTATE ORDER OF PRODUCT ON SCREEN



PRG: CODE 1 = PRODUCT 45

PRG: CODE 2 = PRODUCT 65

PRG: CODE 3 = PRODUCT 85

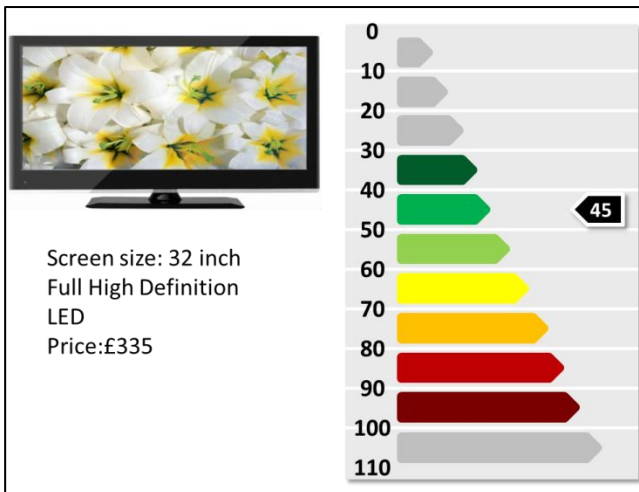
PRG: USE RADIO BUTTONS FOR CODE 1,2,3 – SHOW CODE 4 BELOW

4. I do not know

NEW SCREEN

T3. Looking at the grey arrows at the top of the label, please select the appropriate answer. **PRG: SINGLE ANSWER**

PRG : INSERT RELEVANT PICTURE FOR EACH COUNTRY



The grey arrows at the top of the label indicate the following:

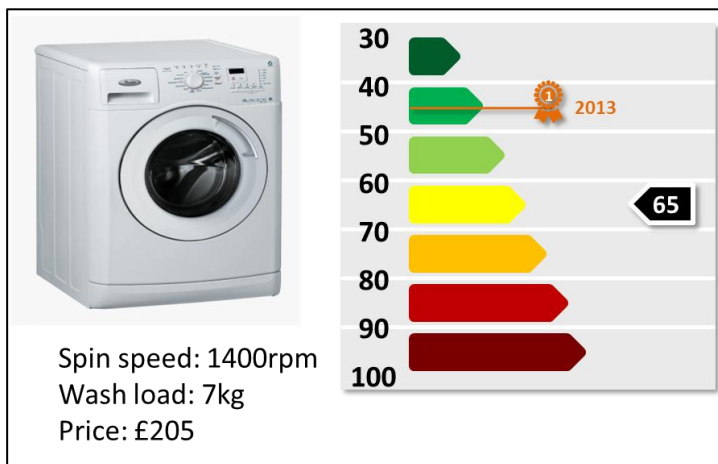
1. They indicate the energy rating of televisions that are available in other countries

2. They indicate the energy rating of products other than televisions
3. They indicate the energy rating of televisions that will be available on the market in the future
4. I do not know

NEW SCREEN

T4. Looking at the orange marker, please select the appropriate answer. PRG: SINGLE ANSWER

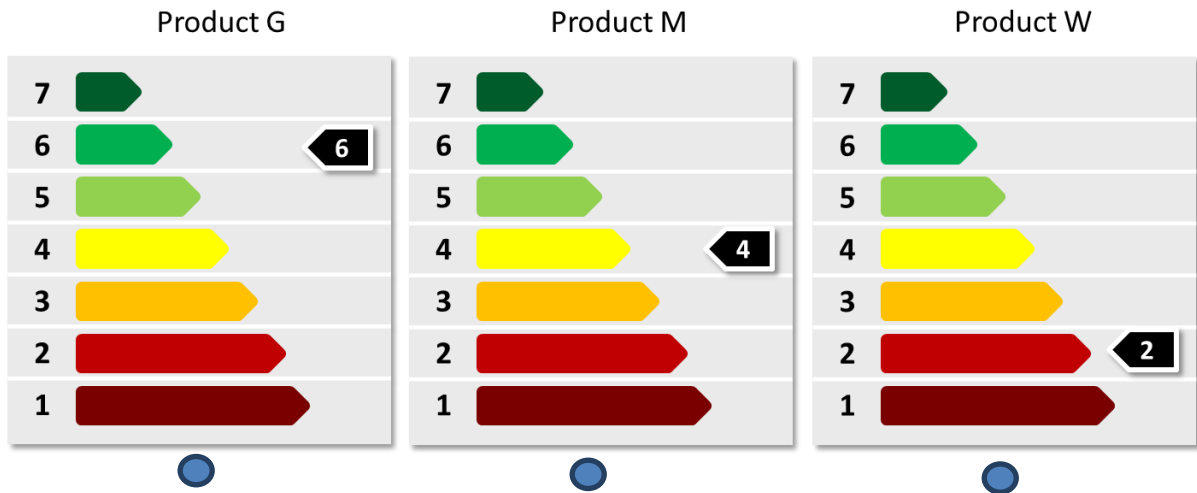
PRG : INSERT RELEVANT PICTURE FOR EACH COUNTRY



The orange marker on the label indicates:

1. The energy efficiency of a washing machine that will be available on the market in the future
2. The best energy efficiency washing machine currently available on the market
3. The energy efficiency of the washing machine shown in the picture above
4. I do not know

T5. Please select the product you think is the most energy efficient. PRG: SINGLE ANSWER
PRG: ROTATE ORDER OF PRODUCT ON SCREEN



PRG: CODE 1 = PRODUCT 6

PRG: CODE 2 = PRODUCT 4

PRG: CODE 3 = PRODUCT 2

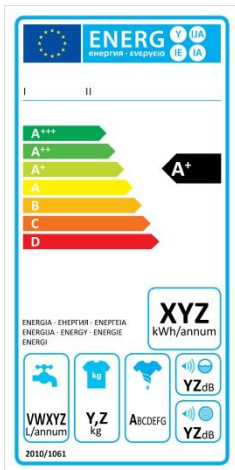
4. I do not know

GENERAL SECTION ABOUT ENERGY LABELS

The last few questions are about your past experience of buying household products.

PRG: PLEASE ROTATE ORDER OF Q1a, Q1b, Q1c

Q1a. Before this survey had you ever seen the following type of label on washing machines?
Please select one answer - PRG: SINGLE ANSWER



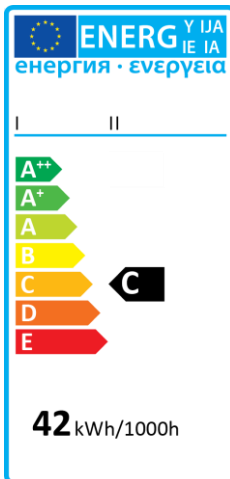
1. Yes
2. No
3. Not Sure / Don't know

Q1b. Before this survey had you ever seen the following type of label on televisions?
Please select one answer - PRG: SINGLE ANSWER



1. Yes
2. No
3. Not Sure / Don't know

Q1c. Before this survey had you ever seen the following type of label on light bulbs?
Please select one answer - PRG: SINGLE ANSWER



1. Yes
2. No
3. Not Sure / Don't know

Q2. Which of the following products have you bought in the last 24 months?

Please select all that apply - PRG: MULTIPLE ANSWERS

1. Washing machine
2. TV
3. Lightbulb
4. Refrigerators
5. Freezer
6. Dishwasher
7. Tumble drier
8. None of the above [SINGLE CODE]

PRG: SHOW IF CODES 1 TO 7 SELECTED AT Q2

Q3. When buying the following product(s), which of the following did you take into consideration?
Please select all that apply for each type of product- PRG: MULTIPLE ANSWERS PER ROW

SHOW IN SCALE: COLUMNS

1. Brand
2. Price
3. Colours [PRG: DON'T SHOW FOR ITEM 3 LIGHTBULB]
4. Energy Efficiency
5. None of these [SINGLE CODE]

SHOW IN ROW: ITEMS (PRODUCTS) SELECTED AT Q2

1. Washing machine
2. TV
3. Lightbulb
4. Refrigerators
5. Freezer
6. Dishwasher
7. Tumble drier

PRG: ONLY SHOW IF MORE THAN ONE CODE SELECTED PER PRODUCT AT Q3

Q4. And which of the following was the most important when buying the following product(s)?
Please select one answer- PRG: SINGLE ANSWER PER ROW

SHOW IN SCALE: COLUMNS SELECTED AT Q3 FOR EACH PRODUCT (IF MORE THAN ONE)

1. Brand
2. Price
3. Colours
4. Energy Efficiency

SHOW IN ROW : ITEMS (PRODUCTS) SELECTED AT Q2

1. Washing machine
2. TV
3. Lightbulb
4. Refrigerators
5. Freezer
6. Dishwasher
7. Tumble drier

PRG: SHOW ONLY IF SCALE CODE 4 SELECTED FOR ANY OF THE ITEMS AT Q3 OR Q4

Q5. You said you took energy efficiency into account when buying your household appliance(s). What was the main reason you considered energy efficiency? *Please select one answer-* **PRG: SINGLE ANSWER**

1. To buy an environmentally friendly product
2. To save on electricity costs with this product
3. To buy a product that will last longer
4. Something else

Thank you for taking part in this survey. Finally, we would like to ask you a few questions about your household. This is to make sure we include a wide range of people in this research.

DEMOGRAPHICS

ASK ALL

D5. Which of the following statements best describes how you feel about your current level of household income?

Please select one answer- PRG: SINGLE ANSWER

1. Living comfortably on present income
2. Coping on present income
3. Finding it difficult on present income
4. Finding it very difficult on present income
5. No answer

D6. What is the highest level of education you have achieved?

Please select one answer- PRG: SINGLE ANSWER

PRG: INSERT LIST PER COUNTRY – BASED ON THE EXCEL FILE PROVIDED
ALL COUNTRIES RECODED INTO

1. Low
2. Medium
3. High

D7. Do you have any children aged 15 years or younger currently living in your household?

Please select one answer- PRG: SINGLE ANSWER

1. Yes
2. No

D8. Which of the following best describes your household situation?

Please select one answer- PRG: SINGLE ANSWER

1. Single (never married)
2. Married or living with partner
3. Divorced or separated
4. Widowed

ON FINAL SCREEN

Thank you for taking part in this survey. These are all the questions we had for you today.

- 5) PRG: SHOW IF WON AT LEAST 1 POINT AND IF QINCENTIVE = CODE 1 (POINTS) SHOW
- 6) You have won a total of [PRG: ENTER TOTAL NUMBER OF POINTS WON] additional survey points in the exercises.

- 7) You will receive your survey points for participating in this survey as usual. Any additional survey points you have won in the exercises will be added to your account after the survey will close. It can take up to eight weeks. Please refer to the terms and conditions for more details.
- 8) **PRG: SHOW LINK TO TERMS AND CONDITIONS**
- 9) **PRG: SHOW IF WON 0 POINT AND IF QINCENTIVE = CODE 1 (POINTS) SHOW**
- 10) You have not won any additional survey points in the exercises but you will receive your survey points for participating in this survey as usual.

PRG: SHOW IF QINCENTIVE = CODE 2 (VOUCHERS) AND WON AT LEAST 1 POINT

- 11) You have won a total of [**PRG: ENTER TOTAL NUMBER OF POINTS WON**] survey points in the exercises.

The survey points you have won will be converted to a voucher that will be sent to you in the next eight weeks. Please refer to the terms and conditions for more details. You will still enter the standard quarterly IIS prize draw for participating in the survey. The voucher you will receive will be in addition to entering the prize draw.

PRG: SHOW LINK TO TERMS AND CONDITIONS

PRG: [QCOUNTRY= CODE 1 AND QSAMPLE= CODE 1 (Czech Republic Ipsos panel)] SHOW:

In order to ensure that your voucher is delivered without any issue, we kindly ask you to enter your postal information below. This information will remain confidential, and will not be communicated to third parties for other purposes than the delivery of your incentive.

6.1.1.1.1 First name /_____/

6.1.1.1.2 Surname /_____/

Address 1 /_____/

Address 2 /_____/

City /_____/

County /_____/

Postcode /_____/

No thanks

PRG: [QCOUNTRY= CODE 5 AND QSAMPLE= CODE 1 (NORWAY Ipsos panel)] SHOW:

- 12) Please confirm the email address we should use to send your voucher.

13) Email: _____

14) No thanks

PRG: SHOW IF QINCENTIVE = CODE 2 (VOUCHERS) AND WON 0 POINT

You have not won any survey points in the exercises but you will you will still enter the standard quarterly IIS prize draw for participating in the survey.



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