THE BEHAVIOURAL INSIGHTS TEAM

Exploring the effect of energy labels on consumer shopping decisions

Quantitative survey, choice experiment, and qualitative interviews

Written by the Behavioural Insights Team.

June 2023

Authors

In alphabetical order: Adam Jones, Andrew Schein, Filip Murar, Jake Reynolds, Lal Chadeesingh, Madeline Gross.

All are equal first authors.

About the Behavioural Insights Team

The Behavioural Insights Team, also known as the Nudge Unit, is a social-purpose company. Originally set up at the heart of the UK government, we are now a global company with offices around the world.

Our mission is to improve people's lives by applying behavioural insights – the knowledge on how people make decisions and behave – to improve public policies and public services.

Any enquiries regarding this publication should be sent to us at:
SABER@beis.gov.uk

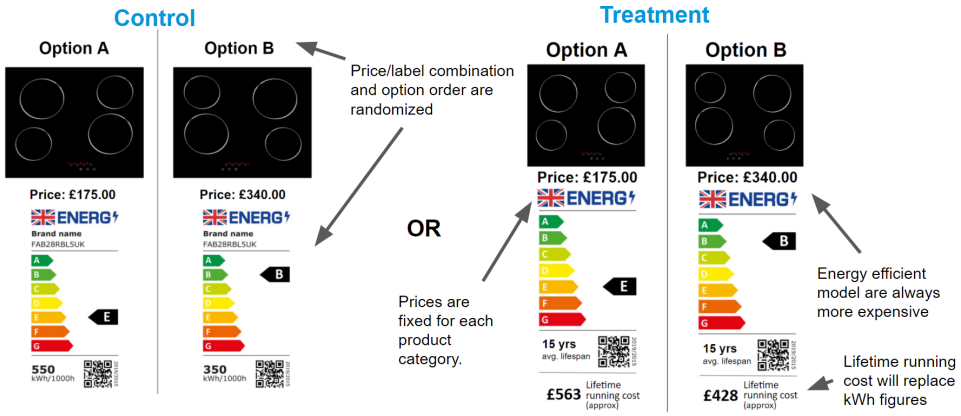
Contents

Executive summary

In autumn 2021, the Behavioural Insights Team (BIT) conducted quantitative and qualitative research to explore the role of energy labels in shaping consumer choices around energy efficiency.

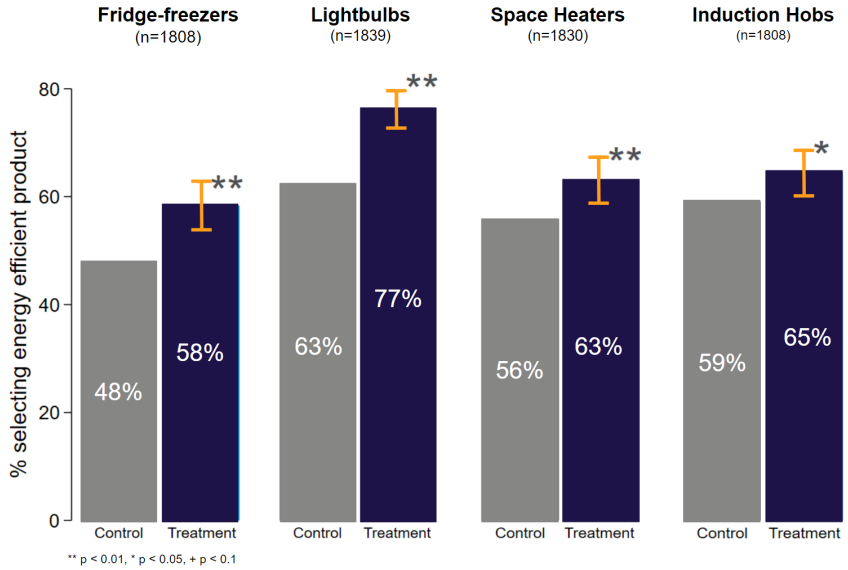
We conducted a **choice experiment** (*N* = 3,044). In the experiment, we examined whether presenting consumers with energy labels displaying a product's 'lifetime running cost' and 'average lifespan' (on the 'treatment' label), rather than kWh/annum (on the 'control' label), influenced product choice (shown in figure A). A second part of the experiment involved examining differences between labels that displayed water consumption in 'litres/annum' versus one that included information about water *and* energy consumption (displaying 'kWh/annum' as well).

Figure A: Example treatment and control labels



We found that replacing the 'kWh/annum' figures on the energy label with 'Lifetime running cost' and 'avg lifespan' significantly increased ($p < 0.05$) hypothetical choices to purchase the more energy efficient product for all product categories (by between 5 - 14% across product category; shown in figure B below). In the experiment investigating labels for shower heads, uptake of the more efficient shower head was approximately equal between the two labels we tested.

Figure B: Percentage of participants selecting the energy efficient product, by product category



In our **online quantitative survey**, we asked participants questions about how they shop for appliances and other energy-related products, barriers to purchasing energy efficient products, and reasons and enablers to purchase energy efficient products.

- Participants ranked 'barriers related to energy labels' as the most important overall.
- A lack of knowledge about energy efficient products, as well as the perception that energy efficient products are more expensive to purchase (in other words, that they have high upfront costs) were also frequently mentioned across product categories as barriers to energy efficient product purchases.
- Participants' confidence in their understanding of the labels was moderate, and they found it hard to translate the information on the energy label to the level of impact using the products would have on the environment and their finances.

Finally, we conducted **qualitative interviews** with 10 individuals to further explore how consumers interact with energy labels while purchasing electrical household appliances.

- During the purchase journey, interviewees said they largely prioritised product utility features and functionality (e.g. bulb shape, fridge capacity, size) and products' upfront price over energy efficiency.
- Despite understanding where to find energy efficiency information, participants did not spontaneously talk about energy labels in the consumer journeys and said that people need to be proactive if they want to use energy labels in their shopping decisions.
- Interviewees said they use energy efficiency information as an approximate indication of running costs and as a rough approximation for how expensive bills will be.
- Many participants said they did not understand the kWh figure and find it confusing, but that they do understand the A - G rating and colour gradient scale and find it useful to help make decisions when purchasing products.

Key conclusions from this research include:

- In our survey, participants placed a higher importance on upfront cost than runnng cost or recuperation cost. However, participants responded well to the presentation of ‘running cost’ information on energy labels in qualitative interviews. This change increased uptake of energy efficient products (by between 5 - 14%) in our choice experiment.
- Participants’ reported comprehension of information on energy labels was low, especially the kWh information. Survey and interview participants reported better understanding A - G colour rating scale, and interview participants discussed relying on that part of the energy label to interpret its overall meaning.
- Overall, participants reported that they knew where to find energy labels when shopping in store or online. However, almost all interviewees in our qualitative interviews said they did not focus on these labels when making purchasing decisions.

We make four policy-relevant suggestions in Table A.

Table A: Policy-relevant suggestions from research

Recommendation	Description
Recommendation 1: Increase salience of energy labels and energy efficient products in consumer journeys, both online and in stores, as well as via communication campaigns.	Consumers tend not to enter the consumer journey with energy efficiency in mind, so do not naturally prioritise it in their decisions to purchase products. There is an opportunity to target policies at raising awareness or increasing the general salience of energy labels in the consumer journey by: ● Encouraging physical stores to arrange products by energy efficiency or highlight high-efficiency products with special signage. ● Encouraging online retailers to sort products by energy efficiency by default and make 'filter by energy efficiency rating' features salient and easy to find. ● Encouraging online and physical retailers to display labels saliently, such as on the front of the product in store and within products' display images online. ● Designing and launching communication campaigns that raise awareness and salience of energy labels on products, ideally education on how to find information in-store and online.
Recommendation 2: Make energy labels easier for people to interpret and include consumer-relevant information.	Illustrate or replace kWh information with estimated running costs (perhaps in terms of annual costs or monthly bills) rather than costs over the 'whole lifetime' of the product. Where possible, emphasise immediate benefits of energy saving products, make differences in running costs salient, and/or connect these differences to customers' current expenditures on energy. This is true both for energy labels and water/energy labels. ● Our choice experiment indicated that 'whole life cost' causes some consumers to choose the more energy efficient product. ● Another option, favoured by some interviewees, would be to display the running cost information as in 'annual' form.
Recommendation 3: Use messaging highlighting personal financial benefits.	Emphasise personal financial benefits (e.g. savings) first; environmental benefits may be persuasive to some consumers but should probably be a secondary message.
Recommendation 4:	We suggest investigating the impact on customer choices of water-

Recommendation	Description
Investigate the impact of making water usage 'relatable' on water labels – through financial or physical analogies.	using products of making water usage estimates 'relatable' – by illustrating the cost financially (combining the cost of water and of the energy required to heat the water) and/or through a physical analogy (e.g. number of bathtubs filled per use, or per year).

Finally, we include recommendations for further research.

Table B: Suggestion for further research

Recommendation	Description
Recommendation 5: Test framing 'running cost' information as 'annual' vs. 'lifetime'	Given feedback from participants that they would find the 'running cost' information easier to interpret if it was framed as 'annual' running cost, we recommend undertaking further research to explore the relative impact of product choice when information is presented this way. This could be through repeating the 'choice experiment' used in this report, but presenting participants with labels framed differently, compared to a control.
Recommendation 6: Assess the impact of energy labels that include 'running costs' in a field trial	In order to gain further external validity, a further research phase would be to explore the impact of presenting 'running cost' information on energy labels to consumers on purchase in the real world, such as through a field trial comparing purchase of energy efficient appliances with different energy labels at physical or online retailers.
Recommendation 7: Research and explore how adding 'running cost' information to labels could be operationalised	Given that energy prices change over time, operationalising and implementing labels that accurately display average running costs may be difficult. Given this, further research could map and explore possible avenues and barriers to implementing this information on labels.

1. Introduction

1.1 Energy labels - aims and barriers

The Government's 'Ten Point Plan' for a green industrial revolution promised to create a world class policy framework for products that consume energy or have an indirect impact on energy consumption. The goal is that these products use less energy, resources, and materials.[1]

Traditionally, two policy instruments influence the market for energy-related products: minimum energy performance standards (MEPS) and energy labels. MEPS gradually exclude the least energy efficient products from the market. Among energy-related products that are not excluded, energy labels can drive further efficiencies – by influencing consumer choices, which in turn may encourage innovation in product design amongst manufacturers. For this mechanism to work, at least some consumers need to notice the labels in their shopping journey and incorporate the information in their purchasing decisions. Applying behavioural insights to label design can be an effective method to enhance their effectiveness.

With the UK's exit from the European Union (EU), the government has an opportunity to take a fresh look at the design of the energy label. When the UK was part of the EU, the EU Ecodesign and Energy Labelling regulatory framework regulated MEPS and energy labels in the UK. This arrangement continued until 1 January 2021, at which point the UK's Department for Business, Energy & Industrial Strategy (BEIS) took responsibility for regulation of MEPS and energy labels.

Energy labelling is required for many products, such as refrigerators, freezers, washing machines, dryers, electronic displays (including televisions), and light bulbs. Most energy labels show energy-related products' energy 'rating' through a colour-coded letter scale – from A (most efficient) through G (least efficient). This scale is used for most common household appliances and follows 're-scaling' work by the EU and BEIS to ensure energy labels clearly reflect the relative efficiency of the products by removing the A+, A++ and A+++ classes. This has made it easier for consumers to understand differences in energy efficiency between products.[2] In the UK, the new energy label scale means that in most cases, the 'best in class' products will be B or C rated, and average-performing products will be D rated or below[3] In addition to the colour-coded letter scale, the labels include other information, including annual energy consumption and (depending on the product) information relating to functionality such as noise associated with the product's operation.

[1] The Ten Point Plan for a Green Industrial Revolution. Department for Business, Energy & Industrial Strategy, and the Prime Minister's Office, 10 Downing Street. (2020). Available at: https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution.

[2] European energy labels: rescaling and transition periods. European Commission. (2021). Available at: https://ec.europa.eu/info/sites/default/files/energy_climate_change_environment/standards_tools_and_labels/documents/rescaled_eu_energy_labels_and_transition_period.pdf.

[3] Consumer FAQs. energylabel.org.uk. Available at: https://energylabel.org.uk/the-new-label/faqs/for-consumers/

There are several potential market failures which could lead to lower-than-optimal uptake of energy efficient products, as identified by previous EU impact assessments[4] [5] [6] of ecodesign requirements and a later impact assessment of the Energy Labelling framework[7]. These include:

- **Cognitively demanding information search:** Consumers may find it difficult to find information about products' efficiency and running costs, resulting in consumers being more sensitive to easily identifiable upfront costs than to difficult-to-identify running costs.
- **Bounded rationality** (where humans do not undertake a full cost-benefit analysis when making decisions) that may explain why even well-informed consumers purchase inefficient products, when doing so is not the rational choice. Consumers may focus their attention on the purchase price, partially or completely ignoring costs and benefits of using the product over its lifetime (akin to present bias or temporal discounting biases).[8] This could also result from consumers' having insufficient funds to purchase costlier but more energy efficient products upfront.
- **Principal-agent problems** that occur where there is a misalignment of incentives between those purchasing the product (e.g. landlords) and those using it (e.g. tenants). Tenants paying energy bills may prefer energy-efficient appliances, whereas landlords paying for the appliances may prefer purchases with lower upfront costs.
- **Energy prices** do not include negative environmental externalities associated with energy production and hence do not reflect the full social cost of energy consumption.

These barriers to uptake of energy efficiency are well-documented in the literature. For instance, Hausman and Joscow discussed some of these same issues in a landmark discussion in 1982 on the costs and benefits of appliance efficiency standards.[9] They listed a similar set of potential market failures: negative externalities from energy, underestimation by consumers of future energy prices, and consumers using discount rates that are 'too high' for their own welfare maximisation. They argued that these market failures could distort consumer decisions towards purchases of products with relatively high running costs.

Recent evidence suggests that consumers do pay attention to lifetime costs of energy-using products. For instance, in analysing all refrigerator purchases from 2008 through 2012 at a major US retailer, researchers exploited quirks of the retailer's pricing algorithm to causally identify customers' willingness to pay for extra energy efficiency.[10] They found that customers

[4] SEC (2008)2110 for the 2008 Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan.

[5] SEC (2008)2115 for the 2008 proposal for a recast of the Ecodesign Directive.

[6] SEC (2008)2862 for the 2008 proposal for a recast of the Energy Labelling Directive.

[7] EU Impact Assessment - Proposal for a Regulation of the European Parliament and of the Council setting a framework for energy efficiency labelling and repealing Directive 2010/30/EU: https://ec.europa.eu/transparency/regdoc/rep/10102/2015/EN/SWD-2015-139-F1-EN-MAIN-PART-1.PDF

[8] Thaler, R. (1981). Some empirical evidence on dynamic inconsistency. *Economics letters*, *8*(3), 201-207.

[9] Hausman, J. A., & Joskow, P. L. (1982). Evaluating the costs and benefits of appliance efficiency standards. *The American Economic Review*, *72*(2), 220-225.

[10] Houde, S., & Myers, E. (2019). Are consumers attentive to local energy costs? Evidence from the appliance market (No. w25591). *National Bureau of Economic Research.*

purchased more expensive but energy efficient refrigerators in areas where local electricity prices were higher. This result suggests that consumers, in some instances, consider energy consumption and product running costs when making decisions about purchases of white goods.

However, consumers' ability to factor in energy costs when making purchasing decisions may rest on manufacturers and sellers providing clear information on appliance labels. For instance, it is possible that improved label design could reduce discounting of future energy costs by making differences in appliances' efficiency and running costs more salient to consumers.

1.2 Experiments investigating potential energy label design improvements

Several studies have investigated the effect of energy labelling on consumer purchasing decisions. Overall, academics generally agree that simple, salient labels that enable clear comparison between different magnitudes are most effective for promoting pro-environmental purchase decisions via eco-labels.[11]

For example, energy labels' scales were simplified in the above-mentioned experiment underpinning EU's changes to labelling. The researchers compared 1) the old energy label design, with the old scale (A+++ to D), 2) a 'numeric' label, 3) a 'reverse numeric' label, and 4) the rescaled label (A to G).[12] The rescaled label most effectively promoted consumers choosing the efficient products in a choice set.

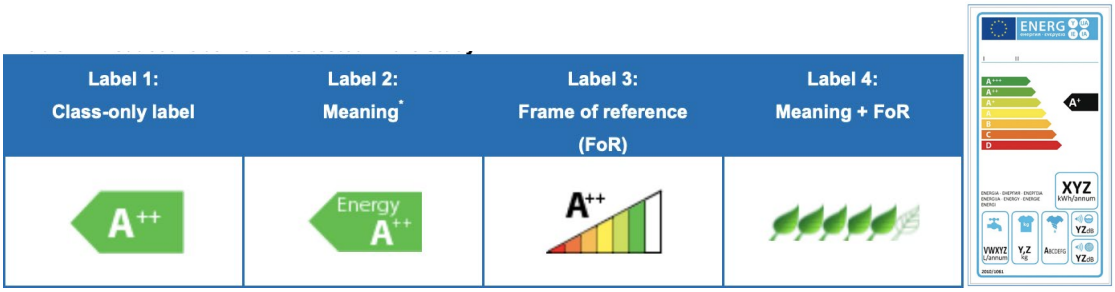
Another experiment (n = 11,764) across 10 EU member states examined the impact of simplifying energy labels by reducing the amount of information on consumers' hypothetical shopping decisions.[13] Participants went through a simulated shopping trip across four different web stores, purchasing refrigerators, televisions, washing machines, and light bulbs. The researchers developed four 'reduced label variants' with less information and randomly varied the type of label participants saw.

[11] Taufique, K. M. R., Polonsky, M. J., Vocino, A., & Siwar, C. (2019). Measuring consumer understanding and perception of eco-labelling: Item selection and scale validation. International journal of consumer studies, 43(3), 298-314.

[12] European Commission. (2015). Proposal for a Regulation of the European Parliament and of the Council setting a framework for energy efficiency labelling and repealing Directive 2010/30/EU. Available at: https://ec.europa.eu/energy/sites/ener/files/documents/1_EN_impact_assessment_part1_v7.pdf

[13] Leenheer, J., Elsen, M., Mikola, N., van der Wagt, M., & Lloyd, L. (2014). Study on the effects on consumer behaviour of online sustainability information displays. *European Commission*.

Figure 1: The labels tested by Leenheer and colleagues in their 2014 study of sustainability information displays on consumer online behaviour



The researchers found that Label 3 (the 'frame of reference' label) most effectively promoted consideration of more energy efficient products. The full label *least* effectively promoted consideration of more energy efficient products – even less so than plain text. The conclusion was that more minimalistic energy labels outperform the more comprehensive versions, though the worst performance of 'reduced' Label 4 weakens this interpretation. It could be that the inclusion of extra colour in Label 3 may at least partially drive its strong performance.

The Behavioural Insights Team (BIT) has also tested simplifying energy labels, by including lifetime running costs. In a trial with John Lewis and the Department of Energy and Climate Change started in 2013 and completed in 2014, we conducted a field trial involving 38 John Lewis stores where 'treatment' stores provided extra information for washing machines, washer dryers and tumble dryers about the machines' lifetime running costs, while the 'control' stores used business-as-usual energy labels.[14] This intervention caused the mix of washer dryers purchased in treatment stores to have on average 0.7% lower annual energy consumption than washer dryers in control stores, but no significant differences were found between treatment and control stores' sales of washing machines or tumble dryers. This mix of findings might be explained by the fact that washer dryers – the product for which the labels worked – have the highest annual energy consumption of the three product categories. However, this was a relatively small study, and the lifetime running costs information was not integrated into the main energy label (instead, it was included in a different information sheet) – potentially reducing the impact of the change. The small effect size compared to the online studies discussed in this section may also represent the smaller effect sizes we should expect when conducting a field trial of an intervention that shows promise in online trials.

[14] The Department of Energy and Climate Change and the Behavioural Insights Team. (2014). Evaluation of the DECC/John Lewis energy labelling trial. Available at: https://www.gov.uk/government/publications/evaluation-of-the-decc-and-john-lewis-energy-labelling-trial

1.3 Evidence gaps leading to this work

Previous research has left several gaps left to explore in the UK context, such as evaluating the impact of the lifetime running costs in a large-scale experiment focusing on consumers' attitudes and behaviours.

BEIS explored potential further improvements to energy label design in a Call for Evidence on energy-related products in 2020.[15] In its summary of responses, BEIS wrote:

> *'The common view of energy labels was that they are somewhat effective with room for improvement. Responses suggested including less information on energy labels would be simpler and easier to understand by consumers. Some participants suggested any additional information which would help consumer choice should be moved online. The barrier most identified to the uptake of the most energy efficient products was their generally larger upfront cost. One potential solution mentioned by participants would be to communicate lifetime running costs to consumers.'*

We investigate the impact of this potential solution in this project, employing an online randomised controlled trial with a representative sample of UK consumers (Section II).

Moreover, most participants to the BEIS consultation were manufacturers and other organisations – leaving a gap in the department's understanding of consumers' perspectives, attitudes, and behaviour towards energy efficient products.

In this project, we use a quantitative survey (Section III) and qualitative interviews (Section IV) to understand the barriers and enablers to purchasing energy efficient products, consumers' interaction with energy labels, and other factors influencing consumers' purchasing decisions.

[15] The Department for Business, Energy & Industrial Strategy. (2020.) Consultation outcome: Energy-related products: call for evidence. Available at: https://www.gov.uk/government/consultations/energy-related-products-call-for-evidence

2. Choice experiment

Summary

In our choice experiment, we examined how a change in label design affected approximately 3,000 participants' hypothetical choice between a pair of products similar in all ways except for their price and energy efficiency. The change was to show participants the product's lifetime running costs and average lifespan, rather than showing the kWh/annum. We found that this change did increase participants' hypothetical uptake of the energy efficient product. This was the case for all four products we tested: light bulbs, fridge-freezers, space heaters, and induction hobs.

A second part of the choice experiment compared a label for shower heads that included information about water consumption (displaying 'litres/annum') with one that included information about water *and* energy consumption (displaying 'kWh/annum' as well). This change had no effect on the uptake of the more efficient shower head.

2.1 Methodology

BIT recruited an online sample of 3,044 participants to take part in a choice experiment and answer survey questions about purchasing energy-related products. Participants completed the choice experiment and then the survey. This ordering was chosen to ensure that the survey did not bias the experiment's results.

The main version of the experiment assessed the impact of including lifetime energy costs on the labels of electrical appliances; a variation of the same design assessed the impact of including energy consumption figures on shower head labels. Participants were randomly assigned to three (of a potential five) product categories for the experiment. For each category, they made one hypothetical choice between a pair of presented products – one efficient product and one less efficient product.

2.1.1 Sampling and recruitment

Survey recruitment & sample

BIT recruited an online sample of 3,044 participants, representative of the general population in the UK in terms of age, sex, income, and location, between the 27th and 30th September 2021. Representativeness was achieved through the use of quotas on these categories, and recruitment was via a panel of survey and market research participants. These sampling criteria were discussed and agreed with BEIS social researchers, who noted that it met expectations of government-funded social research. Table 1 summarises the demographic of the sample collected for the survey and experiment.

It should be noted that this sample may not be representative of the UK in terms of other characteristics. Perhaps most importantly, it does not capture the digitally excluded, or people otherwise not inclined to complete online surveys. This means that our survey and experiment findings may be most applicable to those who have access to and use the internet to make purchases, and may not generalise to other populations. This is also reflected in the demographic breakdown shown in Table 1, where the only group that was notably under-sampled were over-65s, many of whom have limited access to the internet or limited digital skills.

After excluding participants who failed either technical checks or an attention check[16], there were 3,622 who started the survey. Of these, 578 (16%) dropped out before or at some point during the survey; 3,044 finished the experiment and the survey. This attrition rate is not unusual, especially given the length of the survey (median = 12.7 minutes). There was no evidence of differential attrition based on treatment assignment in the choice experiment (p = .39).

[16] BIT uses attention checks in online RCTs to exclude participants who do not carefully read questions and provide considered responses. Our attention check involves one to two questions asking participants to select specific responses to multiple-choice or numerical scale questions. We exclude participants who fail the attention check from further participation in the survey / experiment.

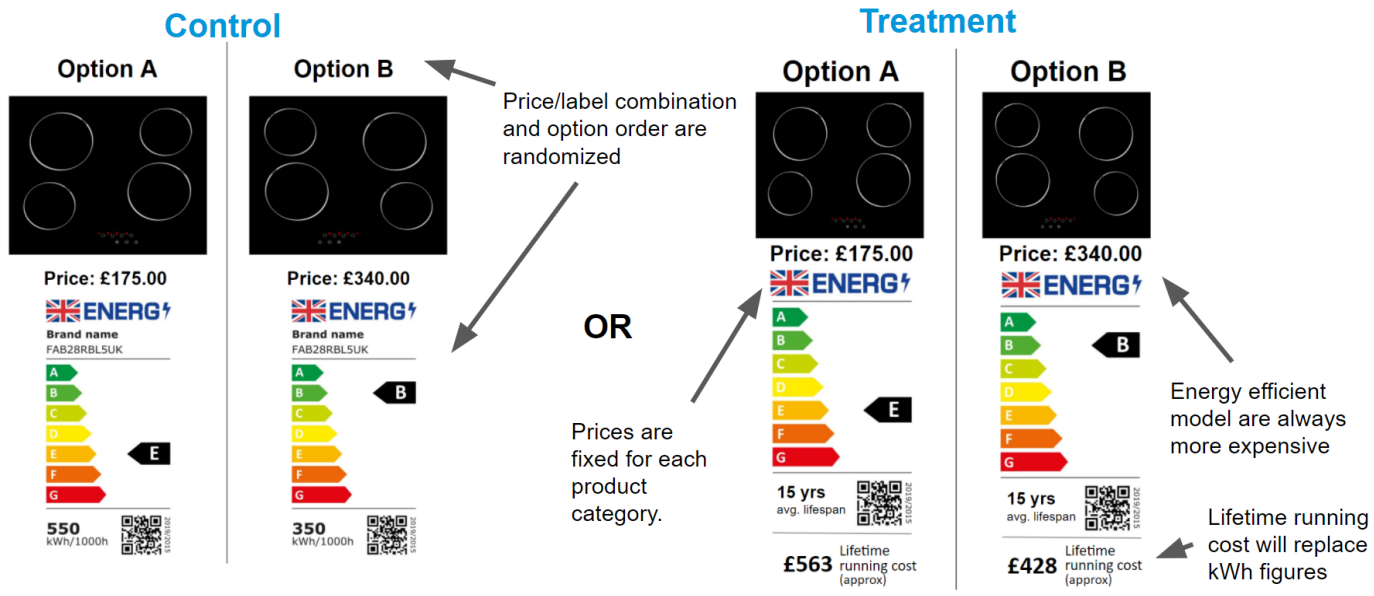
Table 1: Summary of demographics of the experiment and survey sample

	Number of participants (total N = 3,044)	Percentage of sample	Proportion in the UK population
Sex			
Male	1,436	47%	51%
Female	1,604	53%	49%
Other	4	0.1%	<1%
Age			
18-24	322	11%	11%
25-34	585	19%	17%
35-44	566	19%	16%
45-54	513	17%	17%
55-64	563	18%	16%
65 and over	495	16%	24%
Income			
<£20k	904	30%	
£20k-£30k	643	21%	
£30-£45k	696	23%	
>£45k	801	26%	
Ethnicity			
White	2,610	86%	86%
Black	75	2%	3%
Asian	208	7%	8%
Mixed or other	151	5%	3%
Location			
North	771	25%	23%
South & East	913	30%	32%
Midlands	493	16%	16%
London	394	13%	13%
Wales, Scotland & Northern Ireland	473	16%	16%

2.1.2 Energy cost experiment

For four out of five product categories (light bulbs, fridge-freezers, portable space heaters & induction hobs), we tested whether replacing the energy-usage information (the 'kWh/annum' figure on the energy label) with 'Lifetime running cost' and 'avg lifespan' (average product lifespan) would increase the percentage of participants selecting the more efficient, but more expensive product. *The experimental treatment for shower heads was different, as described in the next section, 1.2.* Figure 2 illustrates the differences between the control and treatment arms for induction hobs.

Figure 2: Example illustrating the energy label experiment



In all five product categories, in both the control and treatment arms, participants were shown two products side by side, much like they might see if they used a 'compare product' feature on a retailer's website (such as AO.com, Currys, etc.). They were shown a picture of the products, the product prices, and the products' energy or water efficiency labels. They were then asked which of the two products they would purchase. The difference between the two products was the price and efficiency of the products, with one being more expensive and more efficient than the other.

We randomly assigned our sample, totalling 3,044 participants, to see three out of five product categories, meaning there were approximately 1,800 participants per product category – divided equally between control and treatment arms (~900 per arm per product). Figure 3 outlines this randomization process.

Figure 3: Participant flow in choice experiment

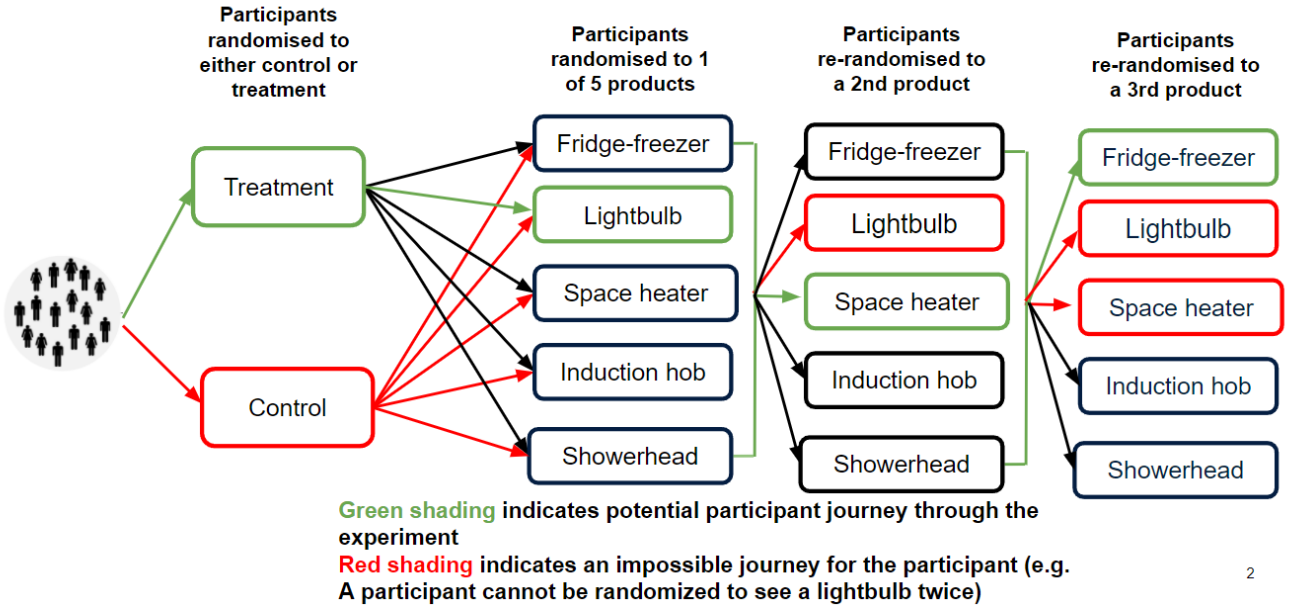


Table 2 outlines the characteristics of the different products across the experiment. Prices and energy consumption figures were determined based on a combination of desk research and a consultation with the BEIS project team. Lifetime costs were calculated based on the annual energy consumption figure, assuming average UK electricity prices in September 2021. BIT worked with BEIS to determine real-world energy consumption figures and energy prices for the control and treatment products. We chose price differences between each efficient and inefficient product by running a pilot where we tested a range of price differences. Based on our findings, we settled on differences where approximately 50% of participants in the control group would select the more efficient product. The reason for doing this was to increase statistical power – the ability to detect an effect, where one exists. For example, if the price difference was so large that the majority of participants were unlikely to select the efficient product, our intervention would have been less likely to lead to a detectable effect.

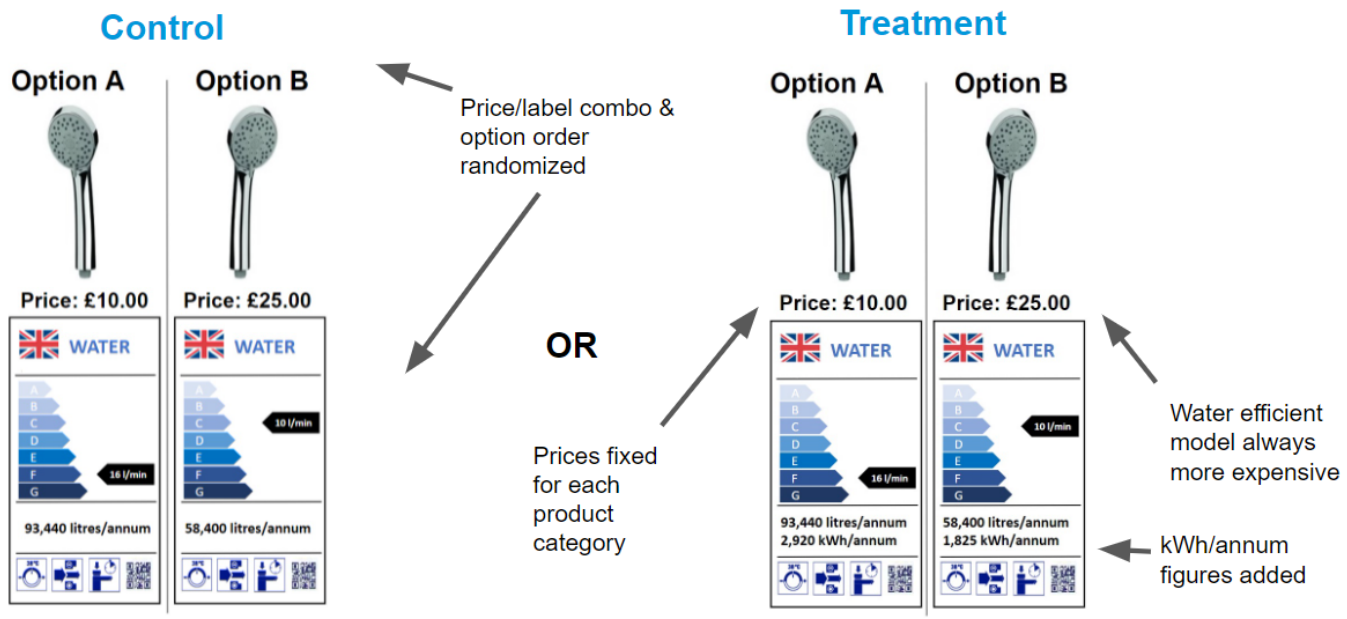
Table 2: Characteristics of experiments' five products

		Fridge - freezer (n=1808)	Light bulb (n=1839)	Space heater (n=1830)	Induction hob (n=1828)	Shower head (n=1827)
Energy/Water Rating	Efficient	C	B	B	B	C
	Inefficient	E	E	E	E	F
Upfront cost	Efficient	£625	£5	£70	£340	£25
	Inefficient	£350	£2	£30	£175	£10
Lifetime running cost (shown in treatment)	Efficient	£454	£45	£294	£428	N/A
	Inefficient	£675	£60	£351	£563	N/A
Energy consumption per year (shown in control)	Efficient	350kWh/ annum	15kWh/ 1000hrs	2kw	173kWh/ 1000hrs	N/A
	Inefficient	462kWh/ annum	20kWh/ 1000hrs	3kw	257kWh/ 1000hrs	N/A
Net savings made by purchasing efficient product (over lifetime of product, assuming no discounting of future savings)		-£54	£12	£17	-£30	N/A
Avg product lifespan (years)		15	27.5	12.5	15	N/A

2.1.3 Shower head label experiment

For shower heads, we tested whether adding information about energy consumption, in the form of a 'kWh/annum' figure, to a hypothetical water efficiency label would increase the percentage of participants who selected the more efficient shower head. The control label did not include this information – it was instead focused on the water efficiency of the shower heads, containing water efficiency and consumption information only. Figure 4 illustrates the labels in more detail. The purpose of this experiment was to establish whether the addition of energy information to a water efficiency label made consumers more likely to purchase a more efficient shower head than when this information was absent.

Figure 4: Example illustrating the shower head label experiment



2.1.4 User testing

Before launching the experiment, we ran five user testing interviews with a convenience sample of non-technical BIT staff. In these interviews, we showed participants a combination of the old and redesigned labels and observed how they interacted with them and how they interpreted the information. The main aim was to identify any 'red flags' in terms of information that was poorly understood.

The redesigned labels used in these interviews contained cost/annum information as a replacement for the kWh/annum information. Interview participants did not perceive the kWh/annum figures as informative. They reported understanding the cost/annum figures and perceived them as useful. Some interview participants indicated that it would have been useful to display the cost in lifetime terms, rather than per-year terms.

As a result, the new labels were further redesigned by the project team, such that the cost/annum information was replaced by lifetime running cost and average lifespan – as specified in section 1.1 above.

2.2 Findings

Before discussing specific findings, note that there are certain limitations to interpreting the results of an online hypothetical choice experiment. First, as noted previously, the participants were representative of the UK in terms of age, sex, income, and location, but did not include digitally excluded or people otherwise not inclined to complete online surveys. Second, answers to hypothetical-scenario questions in the domain of pro-environmental behaviours may be subject to social desirability bias. However, note that participants in both arms saw the same pair of products, and there were no additional references to environmental friendliness in the treatment group. Lastly, since participants did not actually spend their own money, it is

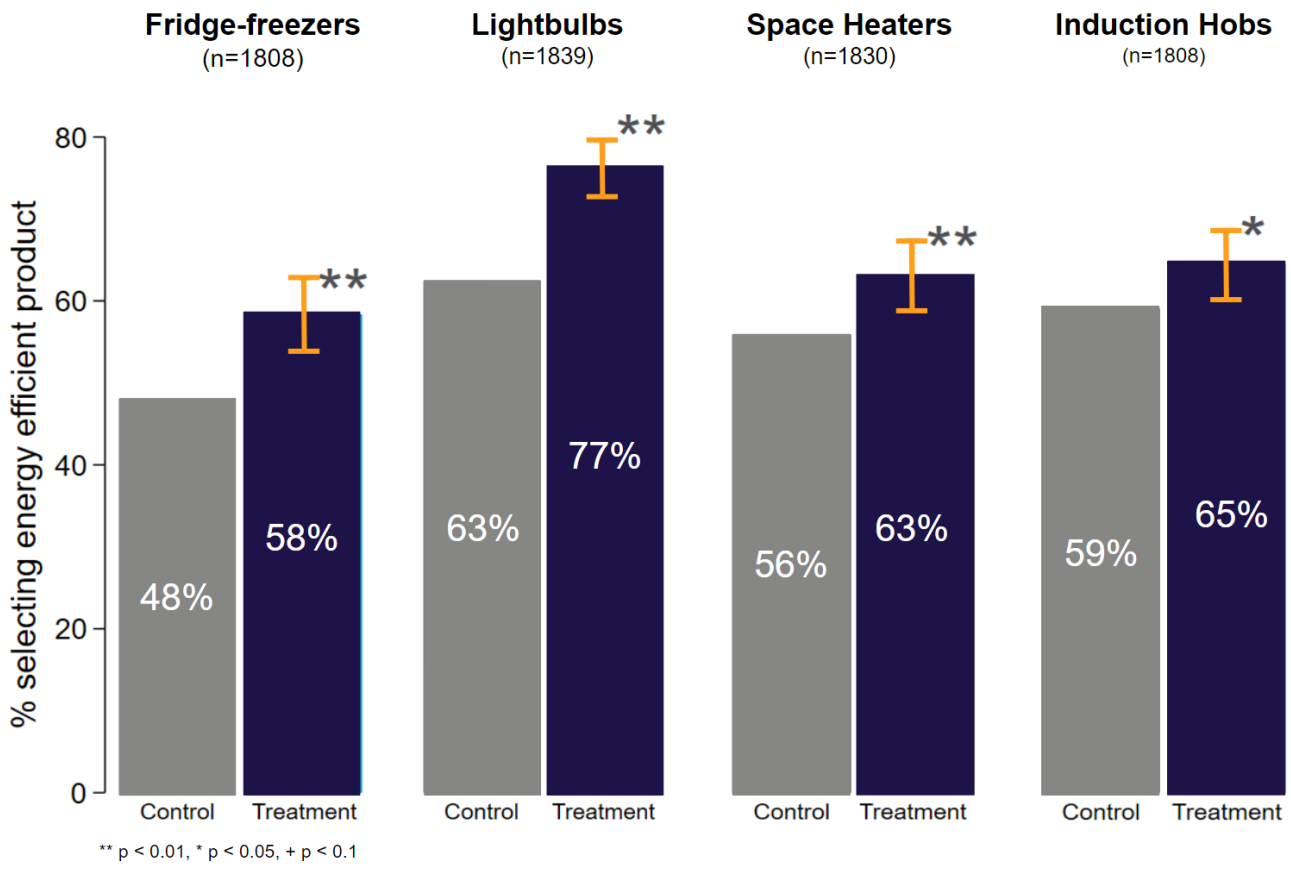
likely that the effects observed in this study somewhat overestimate what we would observe in the real world.

That being said, there are reasons to take these results seriously. Findings from three past BIT studies where an online experiment was followed by a field trial all showed a high degree of agreement between real and simulated behaviours. Agreement was strongest in terms of statistical significance and identification of the best intervention (when multiple interventions were tested) but weaker in terms of effect sizes – in line with our position of treating the effect sizes in this experiment as likely upper bounds of real-world behaviour.

2.2.1 Energy cost experiment

We found that replacing the 'kWh/annum' figures on the energy label with 'Lifetime running cost' and 'avg lifespan' significantly increased ($p < 0.05$) hypothetical choices to purchase the more energy efficient product for all product categories.[17]

Figure 5: Percentage of participants selecting the energy efficient product, split by product category



[17] While we examined demographic differences across age, sex, ethnicity and location, we did not find major differences across demographics in their response to the treatment.

Table 3: Effect sizes by appliance

	Fridge - freezer (n=1808)	Light bulb (n=1839)	Space heater (n=1830)	Induction hob (n=1828)
Difference in % selecting energy efficient product between treatment and control (percentage points)	10 ($p < 0.01$)	14 ($p < 0.01$)	7 ($p < 0.01$)	5 ($p < 0.05$)

What was particularly interesting about these results is that they held true even for products where the long-term energy savings of a product did not make up for its higher up-front cost. In the fridge-freezer experiment, for example, participants would have paid £54 more overall for the efficient fridge-freezer but were 10 percentage points more likely to choose the efficient fridge having been shown this information (as compared to seeing the kWh/annum label). These findings suggest:

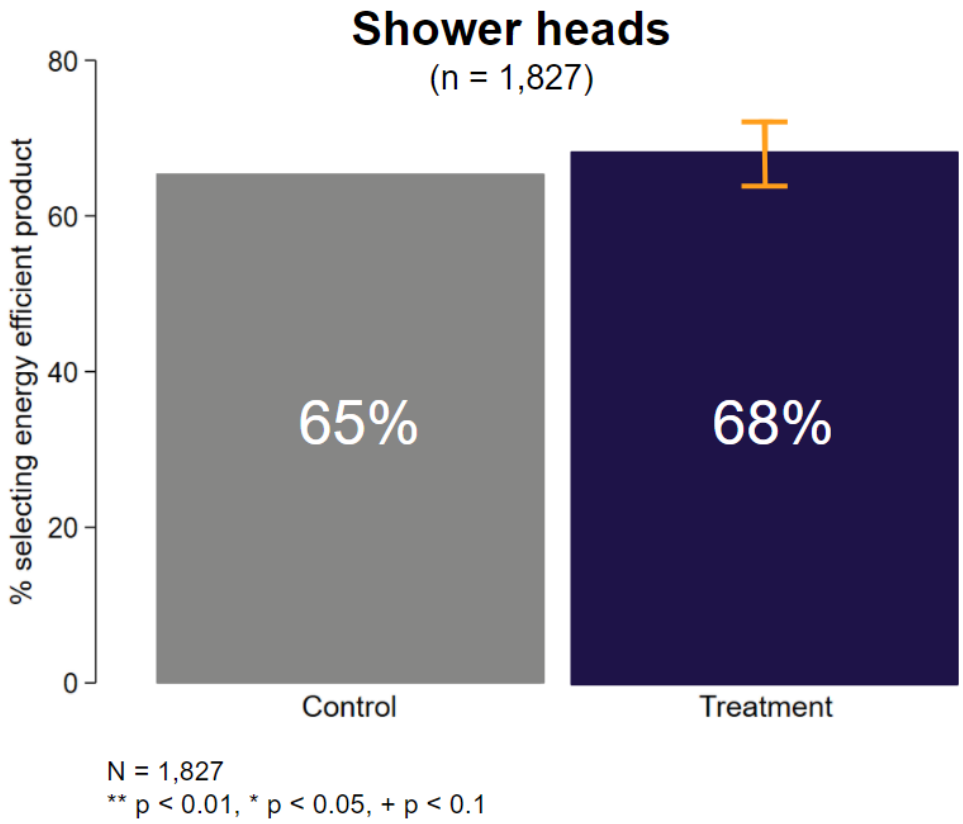
- Some customers do not have a good idea of how kWh energy usage translates into financial savings; directly providing the financial savings does seem to help them understand the benefits of energy efficient products.
- Some customers may not be factoring energy costs into their purchasing decisions at all. Showing customers that they could recoup even some of the higher upfront costs of more efficient products caused some participants to choose the more energy efficient product, even when the long-term energy savings did not fully make up for the higher up-front cost. In the fridge-freezer experiment, for example, participants would have paid £54 more overall for the efficient fridge-freezer, but were 10 percentage points more likely to choose the efficient fridge having been shown this information (as compared to seeing the kWh/annum label). We hypothesise that some participants may view lower running costs as a signal of better quality overall, and/or that 'saving money' is seen as qualitatively useful (where some participants do not do the precise figures to carry out an exact cost/benefit analysis, but still value the running cost savings for some other reason).
- Participants appear to be more motivated by price savings (perhaps in combination with energy and environmental concerns) than by energy and environmental concerns alone.

Note: Further discussion and conclusions are in Section V.

2.2.2 Shower head experiment

We found that adding approximate energy consumption to shower head water efficiency labels had no effect on the percentage of people selecting the more efficient shower head. Figure 6 illustrates these results.

Figure 6: Percentage of participants selecting the efficient shower head



As was found in the survey (discussed in the next section) and qualitative interviews (Section III), participants generally did not have a good understanding of what the kWh figures mean, which may be part of the reason that adding this information did not encourage more environmentally friendly choices. Additionally, even for those with some understanding of what the kWh figures mean, it may not have been clear to the participant where the energy was being used. For example, participants may have wondered whether it was the shower head itself consuming the energy, as opposed to the intended interpretation which concerns the amount of energy used to heat the water.

3. Online survey and experiment

Summary

In our quantitative survey, we asked participants questions about how they shop for appliances and other energy-related products, barriers to purchasing energy efficient products, and reasons and enablers to purchase energy efficient products.

We asked participants to rank barriers within categories – barriers related to characteristics or motivations of individuals, to the products themselves, to elements of the in-store shopping experience, to elements of the online shopping experience, and to the energy labels. After ranking barriers to purchasing energy efficient products by category, we showed participants their top ranked choices from each category and asked them to rank these again in terms of their importance. In this exercise, participants ranked barriers related to energy labels as the most important overall. A lack of knowledge about energy efficient products, as well as the perception that energy efficient products are more expensive to purchase (in other words, that they have high upfront costs) were also frequently mentioned across product categories.

We also found that participants generally found the labels to be credible. However, their confidence in their understanding of the labels was moderate, and they found it hard to translate the information on the energy label to the level of impact using the products would have on the environment and their finances.

3.1 Methodology

In the survey, participants were randomly assigned to one of five product categories: 1) light bulbs, 2) fridge-freezers, 3) portable space heaters, 4) induction hobs, and 5) shower heads. Participants were then asked a series of questions about the enablers and barriers to purchasing energy efficient products and were asked product-specific questions which related to the energy label of the product category they were assigned.

Limitations: When interpreting the results of the survey, it should be noted that just because people say in an online experiment that they would do something, this doesn't mean they always will in real life. We therefore interpret stated intent as a likely upper bound of real behaviour. Finally, note that participants completed the survey immediately after the experiment, so it is possible that views on the relative importance of energy labels were influenced by having completed an experiment involving viewing information about products where the energy label was salient.

Note that we described experiment and survey recruitment and sample in Section II, subsection 1.1.

3.2 Survey Findings

3.2.1 Purchasing behaviour: Information search, and key considerations

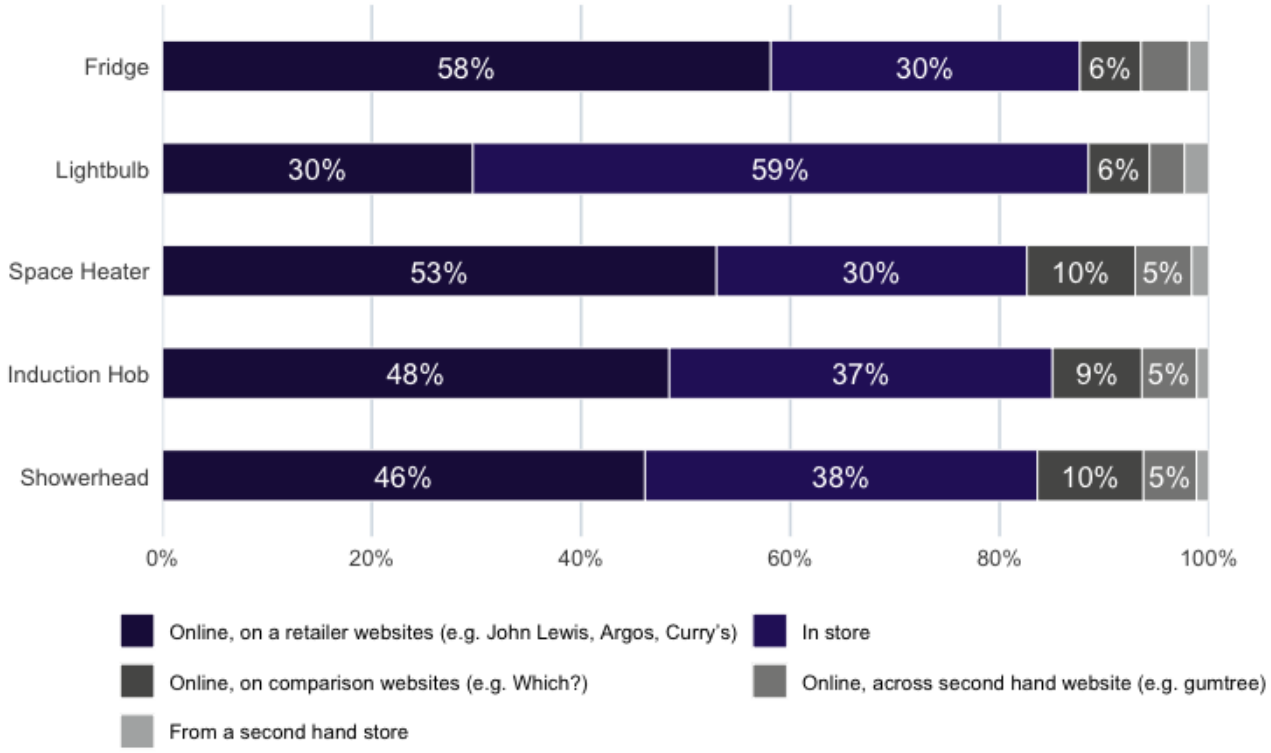
Table 4 outlines people's preferences on where to look when gathering information about a potential purchase. Unsurprisingly, participants relied most on retailer websites to gather information about purchasing products, followed by in-store on their own (though note that this order was reversed for light bulbs). Second-hand websites and social media were the least popular ways to gather information about products.

Table 4: Where do people look for information on household appliances?

	Average	Fridge freezer	Induction hob	Electric heater	Light bulb	Shower head
Retailer	**59%**	65%	62%	65%	45%	58%
In store on one's own	**44%**	44%	43%	40%	53%	41%
Manufacturer	**38%**	42%	47%	41%	26%	33%
Comparison website	**38%**	44%	44%	42%	26%	32%
Ask for assistance in store	**26%**	27%	28%	24%	25%	25%
Social media website	**15%**	15%	17%	17%	14%	15%
Second-hand website	**8%**	8%	8%	9%	7%	7%
Other	Common responses here included "google search" & "I'd ask my spouse/family"					

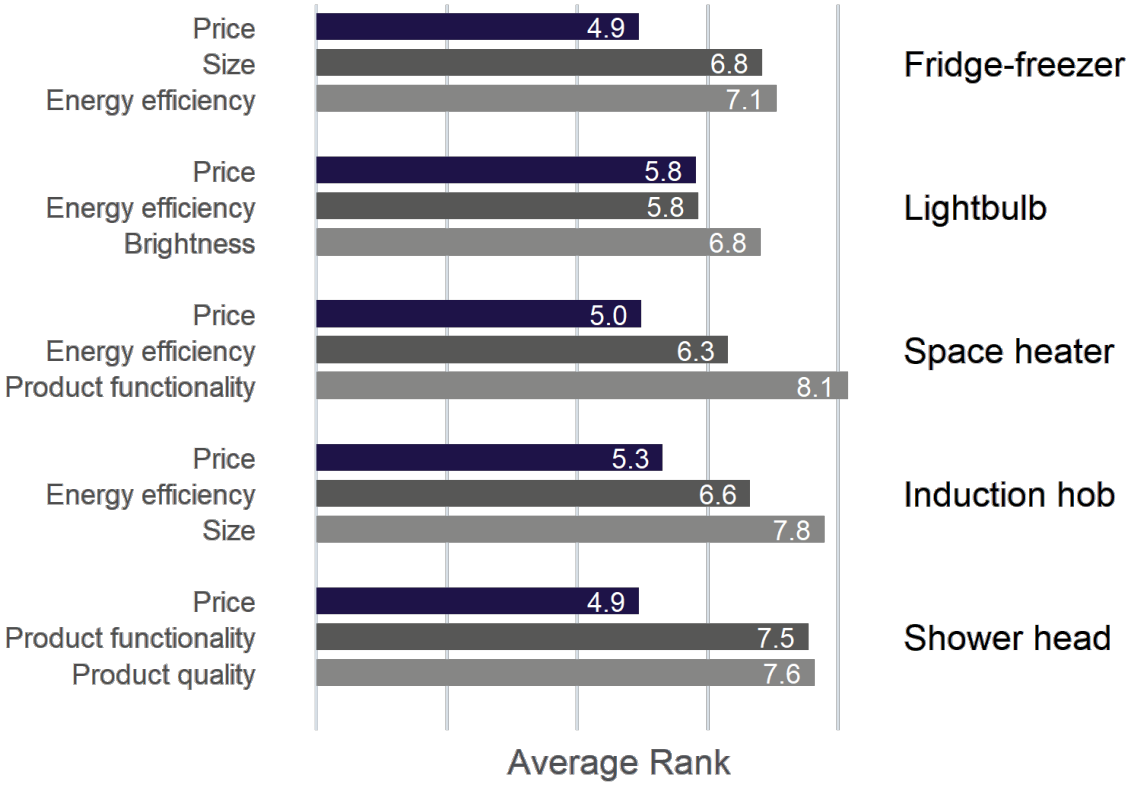
When asked where they'd be most likely to purchase a product, retailer websites, followed by in-store, were the most popular selections. Comparison websites, second-hand websites and second-hand stores received a small percentage of responses. Interestingly, light bulbs were the only product category where participants were more likely to purchase in-store than online. Figure 7 outlines these results by product category.

Figure 7: Where do people purchase different household appliances?



When asked which factors were most important to them when purchasing products, price was consistently rated as the most important factor. Energy efficiency was ranked the second highest among participants on average, but its position as the second-highest factor was less consistent between products than price's position as the highest-importance factor. Outside of these two factors, product quality and functionality were rated highly, particularly for shower heads, while product-specific features (e.g. fridge loudness) were not rated as particularly important. Figure 8 highlights the highest ranked product features by product category.

Figure 8: Most important factors to participants when purchasing household appliances, top 3[18] factors split by product category (average rank out of 17; lower rank = more important)



[18] Full list of reasons to purchase energy efficient products: "Price", "Brand", "Size", "Fridge loudness (fridge-freezer only)", "Fridge storage space (fridge-freezer only)", "Freezer compartment (Fridge-freezer only)", "Number of Rings (Induction hob only)", "Relevance for preferred cooking method (Induction hob only)", "Compatibility with pops & pans (Induction hob only)", "Lighting technology (Light bulb only)", "Brightness (Light bulb only)", "Colour temperature (Light bulb only)", "Water consumption (Shower head only)", "Flow restrictor (Shower head only)", "Auto stop/start features (Shower head only)", "Heating space size (Space heater only)", "Maximum temperature (Space heater only)", "Auto on/off timer setting (Space heater only)", "Aesthetics", "Product quality", "Product functionality", "Financial flexibility", "Expert recommendations", "Recommendations from shop assistant", "Recommendations from friends & family", "Online reviews", "Energy efficiency", "Environmental friendliness", "Independent reviews"

3.2.2 Barriers and enablers to pro-environmental purchases

Reasons for buying energy efficient products

When asked to cite reasons why someone might purchase an energy efficient product, the most frequently cited reasons were beliefs that energy efficient products are cheaper to run and environmental reasons. Responses did not vary much based on which product category a participant was asked about. Table 5 summarises the responses to this question.

Table 5: Reasons for buying energy efficient products, split by product category (% saying 'important')

	Avg. (n=3044)	Fridge-freezer (n=633)	Light bulb (n=600)	Space heater (n=610)	Induction hob (n=609)	Shower head (n=592)
Belief that energy efficient products are cheaper to run and **more cost effective** over time	**80%**	80%	83%	77%	82%	76%
Care about their **impact on the environment**	**78%**	77%	79%	74%	82%	77%
Belief that it is the right thing to do given the current **urgency to reduce climate change**	**75%**	75%	77%	73%	76%	73%
Belief that energy efficient products will **last longer**	**72%**	68%	74%	71%	81%	66%
Thinking it is easy enough to interpret the **energy efficiency** of a product from its **label**	**69%**	69%	68%	67%	73%	67%
Belief that energy efficient products are **produced more sustainably**	**68%**	66%	73%	66%	71%	66%
Belief that energy efficient products are **safer**	**60%**	57%	61%	60%	65%	58%

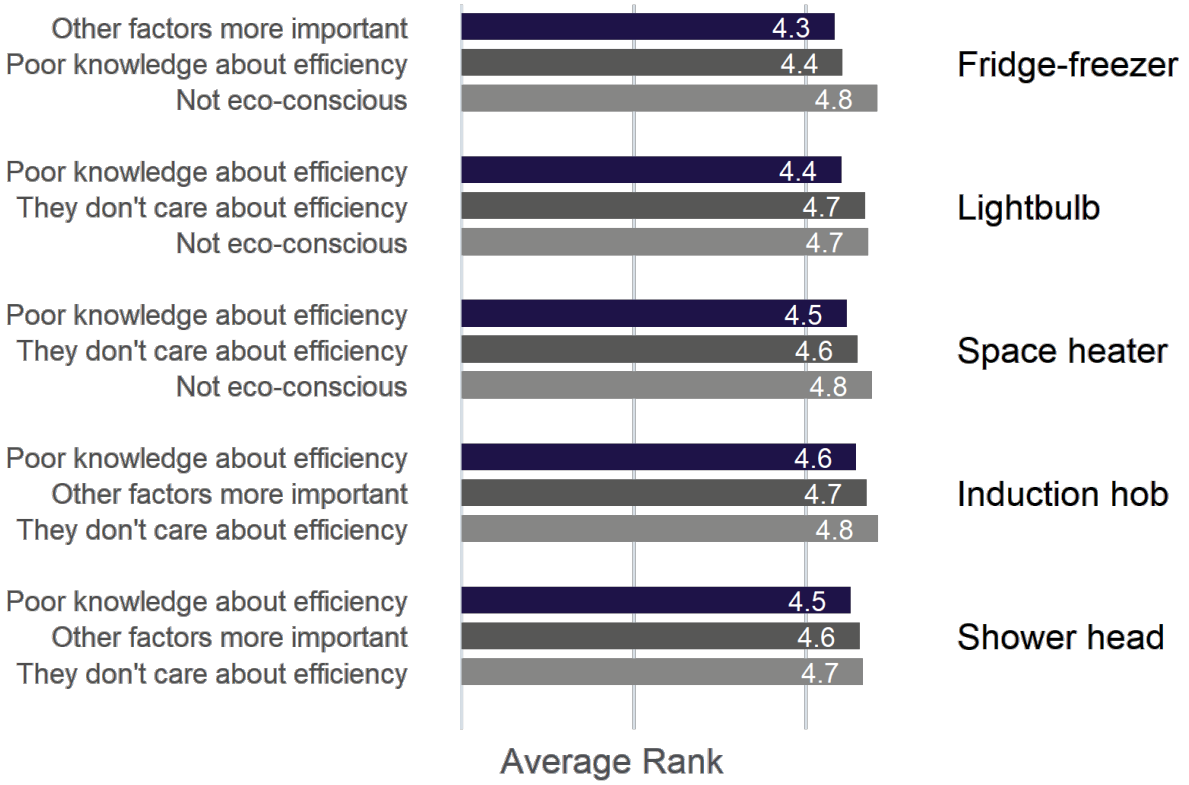
Belief that **most people** buy energy efficient products	**58%**	58%	57%	55%	62%	55%

Reasons to refrain from buying energy efficient products

During the survey we asked people to rank their top 3 reasons, **related to characteristics of individuals**, why people may not purchase energy efficient products. Overall, the rankings were very similar across product categories, with the top three reasons overall being (1) "They have poor knowledge about products' energy efficiency", (2) "Other factors are more important to them", and (3) "They don't care about sustainable products". As shown in figure 9, these factors had an average rank of between 4.3 and 4.8 out of 9.

The lowest-rated factors (not shown in the figure) were "They already do enough to protect the environment" and "They don't know where to start looking for energy-efficient products", with average ranks of 5.7 and 5.3, respectively.

Figure 9: Individuals-related reasons people don't buy energy efficient products, top 3[19] reasons split by product category (average rank out of 9; lower rank = more important)



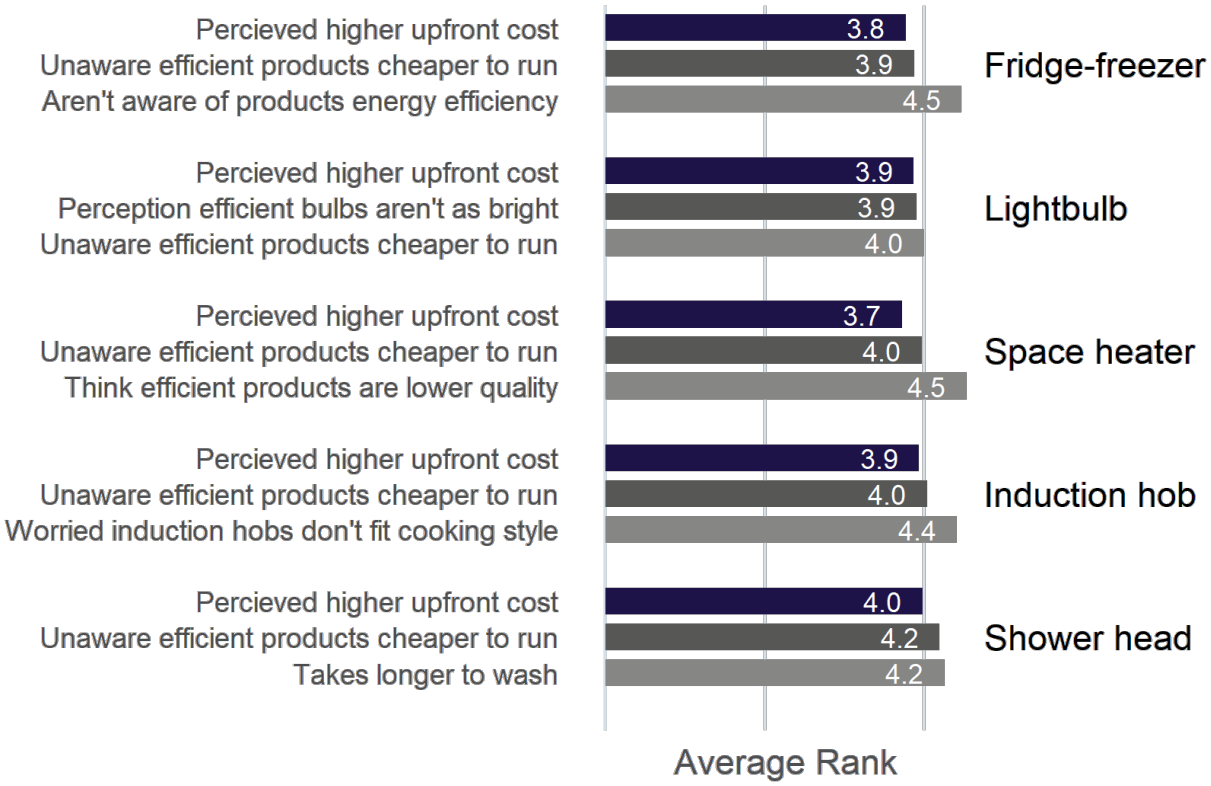
[19] Full list of individual barriers participants were asked about: [They…] "are not very eco-conscious ", "have poor knowledge about products' energy efficiency", "do not know about environmental sustainability", "think that energy-efficient products do not make a difference to our environment", "already do enough to protect the environment", "don't know where to start looking for energy-efficient products", "don't care about buying sustainable products", "are not confident in buying energy efficiency products because it is new to them", "Other factors of the product are more important to them"

When it came to **product-related barriers** to purchasing energy efficient products, the perception of energy efficient products as having a higher upfront cost was the highest ranked barrier, with an average rank of 3.8 out of 8 (averaged across the five product categories). Lack of awareness that efficient products have lower running costs was a close second place, with a rank of 4.0. Conversely, distrust of energy efficiency claims was the lowest ranked barrier, with an average rank of 4.9, suggesting that this is not a common concern.

Among product-specific barriers, the perception that energy efficient light bulbs were not as bright was highly ranked (3.90), as was the perception that an efficient shower head would use less water and therefore require more shower time (4.25).

Figure 10 shows the top three product barriers broken down by category.

Figure 10: Product-related reasons people don't buy energy efficient products, top 3[20] reasons split by product category (average rank out of 8; lower rank = more important)



[20] Full list of product barriers participants were asked about: [They…] "don't trust efficiency claims", "think that standard products work better than energy-efficient ones", "think that energy-efficient products are usually more expensive than standard products", "do not understand that it is cheaper to run energy-efficient products", "aren't aware of a product's energy efficiency when they buy it", "do not understand how to find out how energy-efficient a product is", "worry that they will have a less enjoyable shower with an energy-efficient shower head" (shower head only), "worry that a less powerful shower head will mean it will take longer to wash, so they will use more water" (shower head only), "think that energy-efficient light bulbs are not as bright" (light bulb only), "do not like the colour of energy-efficient light bulbs" (Light bulb only), "are worried that an energy-efficient portable space heater would not keep them warm" (space heater only), "are worried that an energy-efficient portable space heater would be bigger and less aesthetic" (space heater only), "Induction hobs and stovetops run on electricity, which is more expensive than gas" (induction hob only), "worry that electric/induction hobs do not work as well for the way they like to cook" (induction hob only), "are worried that an energy-efficient fridge freezer would not keep their food cool enough" (fridge-freezer only), "don't believe that a fridge freezer can really be energy efficient" (fridge-freezer only)

Generally speaking, there were high levels of disagreement between participants when ranking **point-of-purchase barriers**, both in store and online – leading to somewhat similar *average* ranking of point-of-purchase barriers. These barriers were also ranked quite low when ranked against other barrier types later in the survey, suggesting that the barriers at this stage in the customer journey are not perceived as particularly problematic for consumers. Figures 11 and 12 show the ranking of in-store and online barriers respectively.

Figure 11: In-store barriers to buying energy efficient products, all four reasons split by product category (average rank out of 4; lower rank = more important)

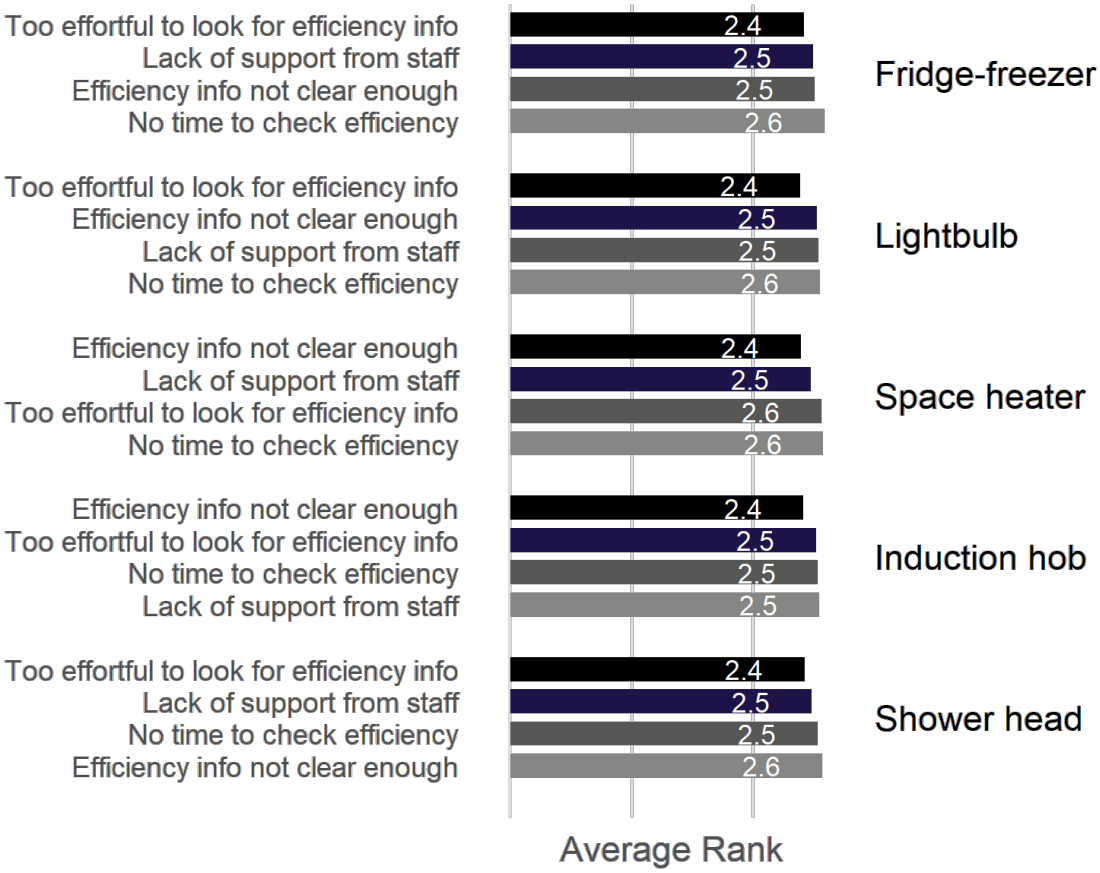
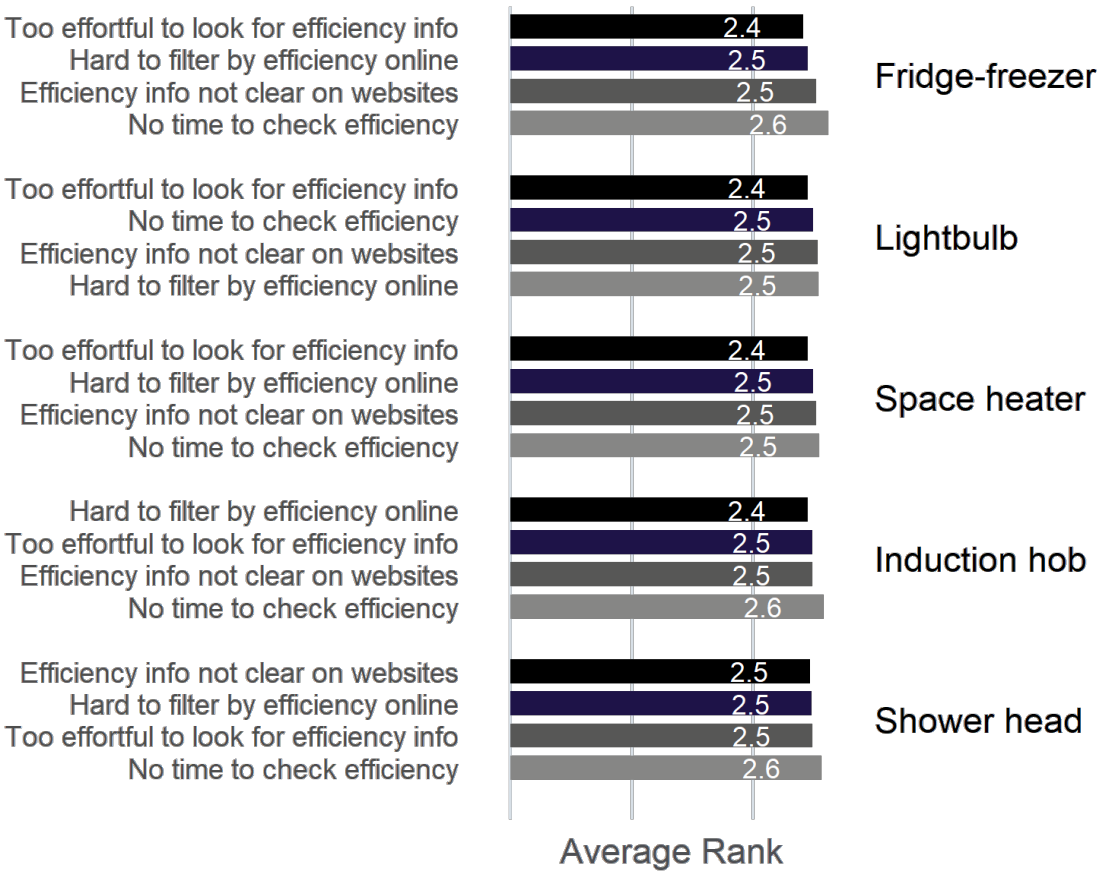
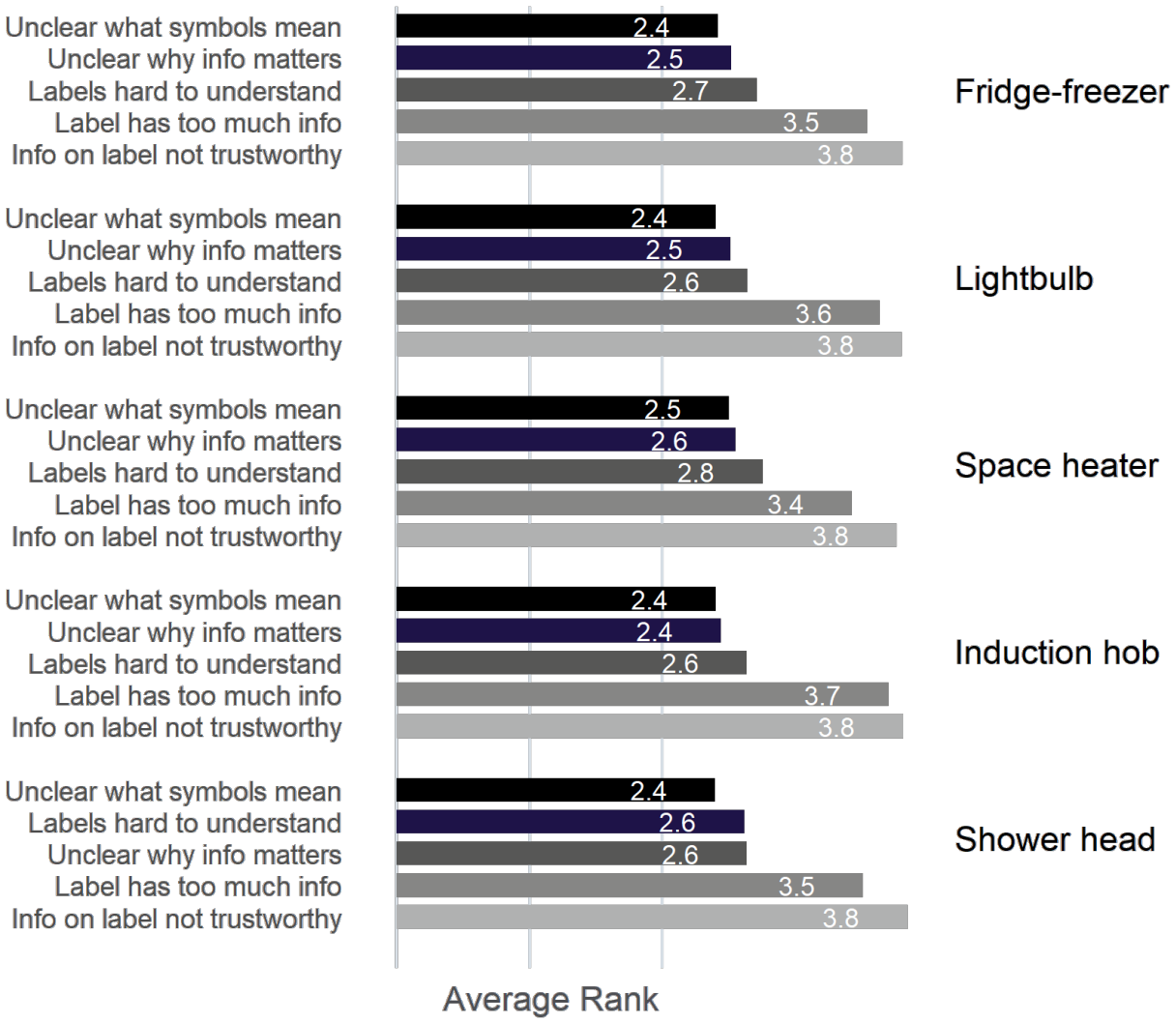


Figure 12: Online barriers to buying energy efficient products, all 4 reasons split by product category (average rank out of 4; lower rank = more important)



Next, participants were asked to select and rank their top three **barriers related to energy labels**, of the five presented to them. Figure 13 shows that, across product categories, energy labels were perceived as complex, it was not clear to participants why some of the information on the label mattered, and it was not clear what the symbols on the labels meant (see Figure 15 for the labels used in the survey – in general, the symbols on these labels give information about product functionality, such as fridge-freezers' volume (in litres) of the refrigerator and freezer components). As discussed earlier, participants generally seemed to trust the information on the labels, and they didn't think the label had too much information.

Figure 13: Barriers related to energy labels to buying energy efficient products, all 5 reasons split by product category (average rank out of 5; lower rank = more important)



3.2.3 Overall ranking of barriers

After ranking barriers to purchasing energy efficient products by category, participants were shown their top ranked choices from each category and were asked to rank these again in terms of their importance. Table 6 shows these results by product category. Among all product categories, barriers relating to understanding and engaging with energy labels were ranked as the most significant overall. A lack of knowledge about energy efficient products, as well as the perception that energy efficient products are more expensive to purchase (in other words, that they have high upfront costs) were also frequently mentioned across product categories.

Note, again, that participants completed the survey immediately after the experiment, so it is possible that views on the relative importance of energy labels were influenced by having completed an experiment involving viewing information about products where the energy label was salient.

Table 6: Overall ranking of all barriers to purchasing energy efficient products, split by product category (% of participants ranking in the top 3)

	Barrier Type	Avg. (n=3044)	Fridge-freezer (n=633)	Light bulb (n=600)	Space heater (n=610)	Induction hob (n=609)	Shower head (n=592)
It is not clear what the symbols mean	Energy label	**26%**	30%	25%	22%	25%	26%
It is not clear why the information on this label matters	Energy label	**20%**	21%	20%	19%	20%	19%
Energy labels are hard to understand	Energy label	**18%**	19%	19%	16%	18%	20%
They think that energy efficient products are usually more expensive to purchase than standard products.	Product	**18%**	20%	20%	18%	16%	17%
They worry that a less powerful shower head will mean it will take longer to wash, so they will use more water **(Shower head only)**	Product	**15%**	-	-	-	-	15%
They do not understand that it is cheaper to run energy efficient products	Product	**14%**	14%	16%	13%	14%	12%
They have poor knowledge about products' energy efficiency	Individual	**14%**	13%	15%	13%	15%	12%
They think that energy efficient light bulbs are not as bright **(Light bulb only)**	Product	**13%**	-	13%	-	-	-

	Barrier Type	Avg. (n=3044)	Fridge-freezer (n=633)	Light bulb (n=600)	Space heater (n=610)	Induction hob (n=609)	Shower head (n=592)
Other factors of the product are more important to them (e.g. functionality, design, performance)	Individual	**13%**	17%	9%	12%	13%	14%
Induction hobs and stovetops run on electricity, which is more expensive than gas **(Induction hobs only)**	Product	**12%**	-	-	-	12%	-
They don't care about buying sustainable products	Individual	**12%**	10%	10%	14%	13%	11%
They are not very eco-conscious	Individual	**11%**	11%	12%	11%	10%	12%
They worry that they will have a less enjoyable shower with an energy efficient shower head **(shower head only)**	Product	**10%**	-	-	-	-	10%
They are worried that an energy efficient portable space heater would not keep them warm **(Space heater only)**	Product	**10%**	-	-	10%	-	-
They worry that electric/induction hobs do not work as well for the way they like to cook **(Induction hobs only)**	Product	**10%**	-	-	-	10%	-
They think that standard products work better than energy efficient ones	Product	**10%**	8%	12%	10%	10%	9%
They do not understand how to find out how energy efficient a product is	Product	**9%**	8%	11%	8%	10%	8%
They do not like the colour of energy efficient light bulbs (e.g. yellow vs. white light) **(Light bulb only)**	Product	**9%**	-	9%	-	-	-
They think that energy efficient products do not make a difference to our environment	Individual	**9%**	8%	8%	10%	9%	9%
They aren't aware of a product's energy-efficiency when they buy it	Product	**9%**	10%	7%	9%	9%	9%

	Barrier Type	Avg. (n=3044)	Fridge-freezer (n=633)	Light bulb (n=600)	Space heater (n=610)	Induction hob (n=609)	Shower head (n=592)
The label has too much information	Energy label	**8%**	10%	6%	8%	8%	10%
A product's energy efficiency is not clear enough (or easy to spot)	In-store	**8%**	6%	6%	10%	9%	8%
They are not confident in buying energy efficiency products because it is new to them	Individual	**7%**	6%	8%	7%	9%	7%
People find it takes too much effort to search for a product's energy efficiency	In-store	**7%**	7%	8%	6%	7%	8%
There is a lack of support and guidance from staff about product energy efficiency in store	In-store	**7%**	9%	5%	9%	6%	7%
People find it takes too much effort to search for a product's energy efficiency online	Online	**7%**	7%	7%	9%	6%	6%
They are worried that an energy efficient fridge freezer would not keep their food cool enough **(Fridge-freezer only)**	Product	**7%**	7%	-	-	-	-
They don't believe that a fridge freezer can really be energy efficient **(Fridge-freezer only)**	Product	**7%**	7%	-	-	-	-
They do not know about environmental sustainability	Individual	**7%**	7%	8%	6%	7%	6%
They don't know where to start looking for energy efficient products	Individual	**7%**	6%	8%	7%	7%	7%
It is not easy to filter online searches for energy efficiency while shopping	Online	**7%**	8%	6%	8%	6%	4%
People don't always have time to check a product's energy efficiency online	Online	**7%**	6%	8%	6%	6%	7%
They do not really trust the product energy efficiency claims	Individual	**6%**	6%	5%	8%	5%	7%
Websites don't make a product's energy efficiency clear enough (or easy to spot)	Online	**6%**	5%	6%	6%	6%	7%

	Barrier Type	Avg. (n=3044)	Fridge-freezer (n=633)	Light bulb (n=600)	Space heater (n=610)	Induction hob (n=609)	Shower head (n=592)
online							
They are worried that an energy efficient portable space heater would be bigger and less aesthetic **(Space heater only)**	Product	**6%**	-	-	6%	-	-
People don't always have time to check a product's energy efficiency	In-store	**6%**	6%	6%	6%	5%	7%
The information on the label is not trustworthy	Energy label	**6%**	6%	5%	7%	5%	5%
They already do enough to protect the environment (e.g. they are vegetarian or donate to environmental charities)	Individual	**4%**	4%	3%	4%	5%	3%

We also asked participants for some free-text feedback, asking if there were any other reasons they would, or wouldn't, buy energy efficient products. These comments mainly echoed the findings from the ranking questions, with price being a commonly cited barrier to purchasing efficient products and 'doing our bit' for the environment being a commonly cited enabler.

We also asked if they could think of anything else that would make it easier for consumers to purchase energy efficient products, and found some interesting suggestions:

- **When searching online**, it was suggested that sites should *"list products from most energy efficient first to attract customers"* and that customers should have *"the opportunity to search by running costs".*
- Making **energy savings more salient** was mentioned frequently, with one participant suggesting retailers should show *"How much money it saves in comparison with a named standard model".*

3.2.4 Understanding and usage of energy labels

As we discuss next, most participants have low or moderate confidence in estimating products' energy efficiency, and most are confused about the meaning of symbols and information other than the headline coloured A-G scale. However, as discussed in Section IV discussing findings from 10 qualitative interviews, customers may ignore the information they find confusing and focus on the information they understand in order to make a purchasing decision. Therefore, whilst confusion about kWh is a limitation it does not necessarily dissuade purchase. Note also that there is a non-negligible minority of participants who rate the symbols and kWh value as useful. That said, the experiment found that illustrating the kWh value in financial terms changed a meaningful number of participants' hypothetical choice, suggesting that another set

of participants would make a different (hypothetical) choice given a somewhat different presentation of running costs.

How people use energy labels

Approximately 3 in 4 of participants said they had seen fridge-freezer, light bulb, and induction hob labels before, while fewer said they had seen labels for a space heater – possibly because people buy space heaters less often than the other products. Approximately 30% of people also said they had seen the shower head water labels before, even though they aren't currently in circulation, suggesting some confusion around the differences between label types. Despite this stated familiarity with the labels, we found that participants typically didn't know where to look for energy labels, with 49% saying they'd know where to look in store, and only 29% saying they'd know where to look online.

Figure 14: Percentage of people saying they have seen each of the five labels

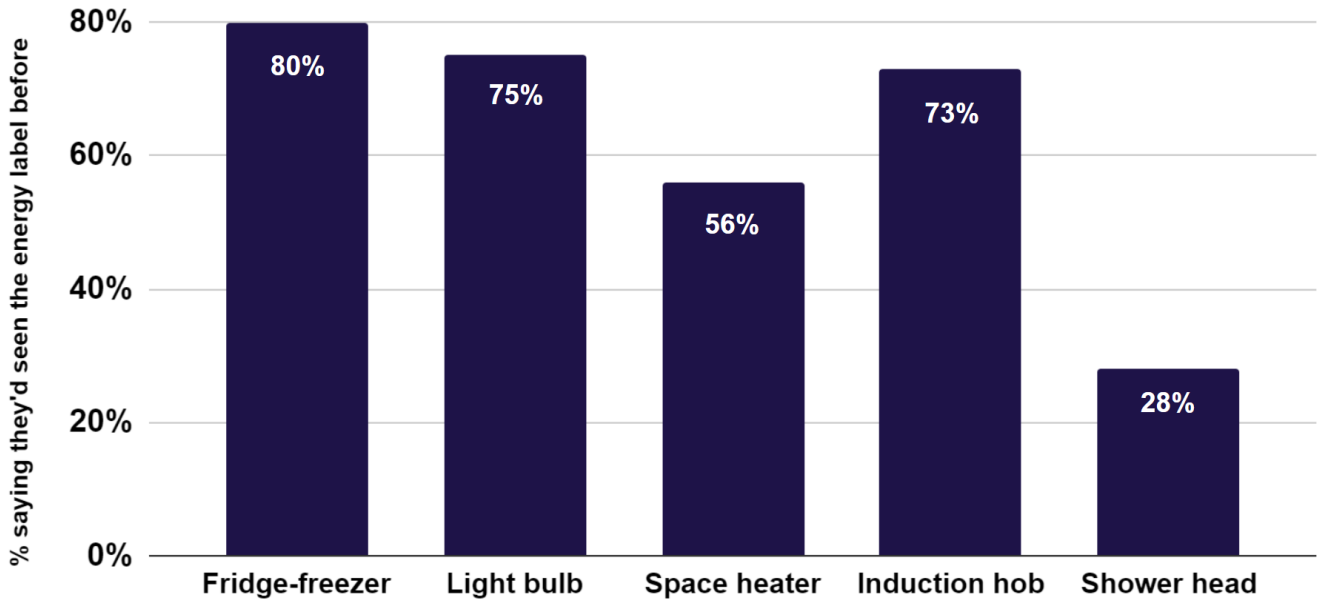
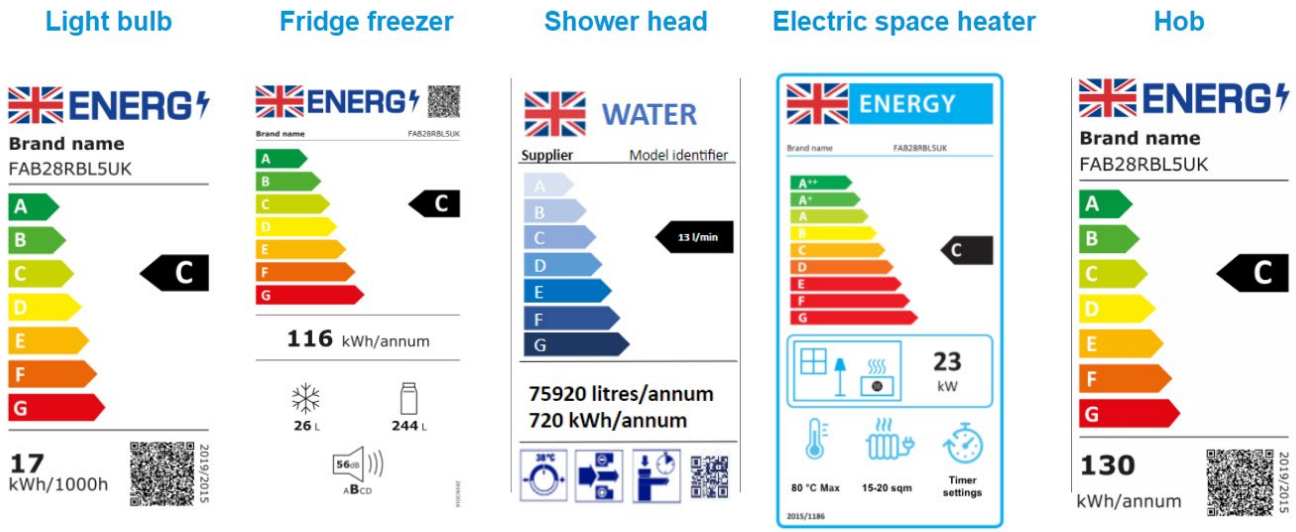


Table 7 continues to build upon the findings that energy labels are typically not well understood across product categories. Generally speaking, the only aspect of the labels that people found informative were the A-G rating scale, with the symbols, QR code, and the kWh figures generally being perceived as not very useful (see Figure 15 for the labels that were used).

Table 7: Percentage of participants finding each element of the label useful

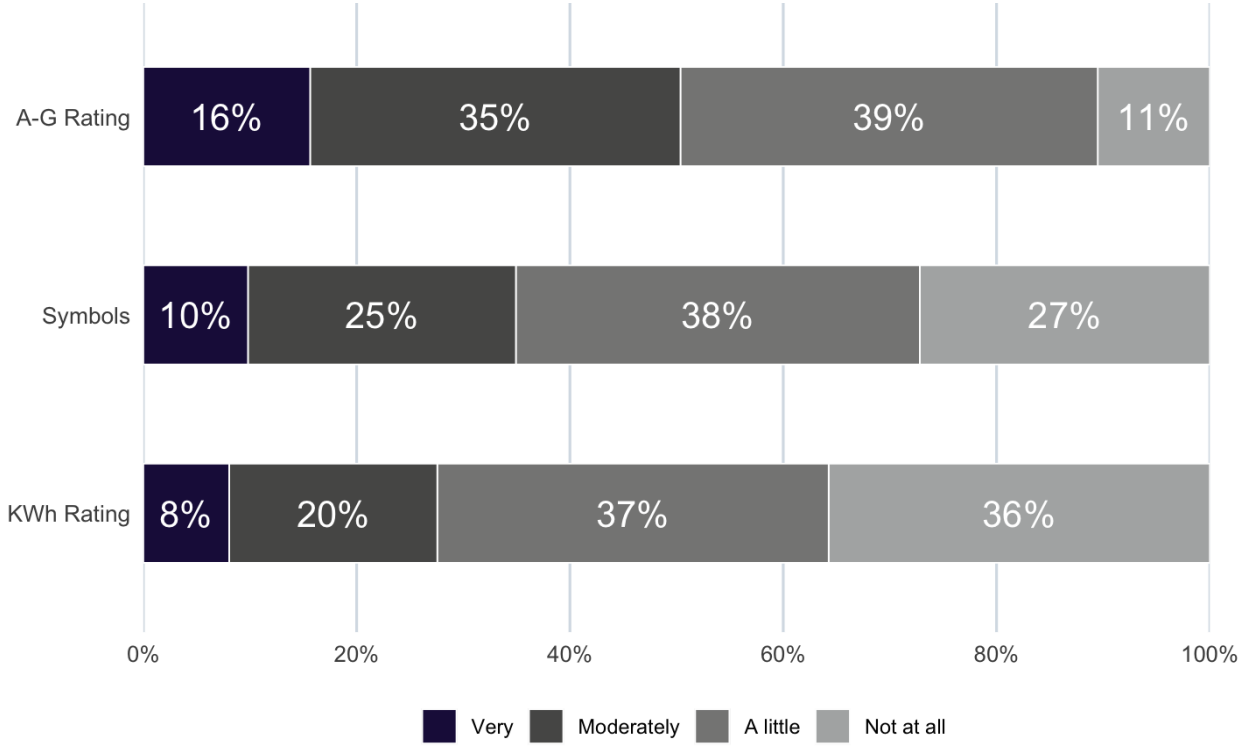
	Avg. (n=3044)	Fridge-freezer (n=633)	Light bulb (n=600)	Space heater (n=610)	Induction hob (n=609)	Shower head (n=592)
The A-G colour rating scale	**75%**	75%	78%	74%	75%	73%
The symbols	**27%**	27%	-	31%	-	25%
The kWh value	**23%**	21%	23%	23%	28%	20%
The QR code	**16%**	13%	18%	-	17%	15%

Figure 15: Energy and water label examples



To test participants' understanding of the A-G rating, we showed them an energy label with a 'C' rating and asked them to judge how efficient the product was, from 'Not very efficient at all' to 'Highly efficient'. 53% of participants rated the product as moderately efficient, and 31% rated it as somewhat efficient, suggesting that participants had an intuitive understanding of the A-G scale, but were not aware of the intricacies of rescaling (such that 'C' products are efficient relative to alternatives currently available). We also asked participants to guess what various symbols on the labels meant, and the guesses were generally very inconsistent, reinforcing the idea that people do not have a good understanding of what the symbols mean.

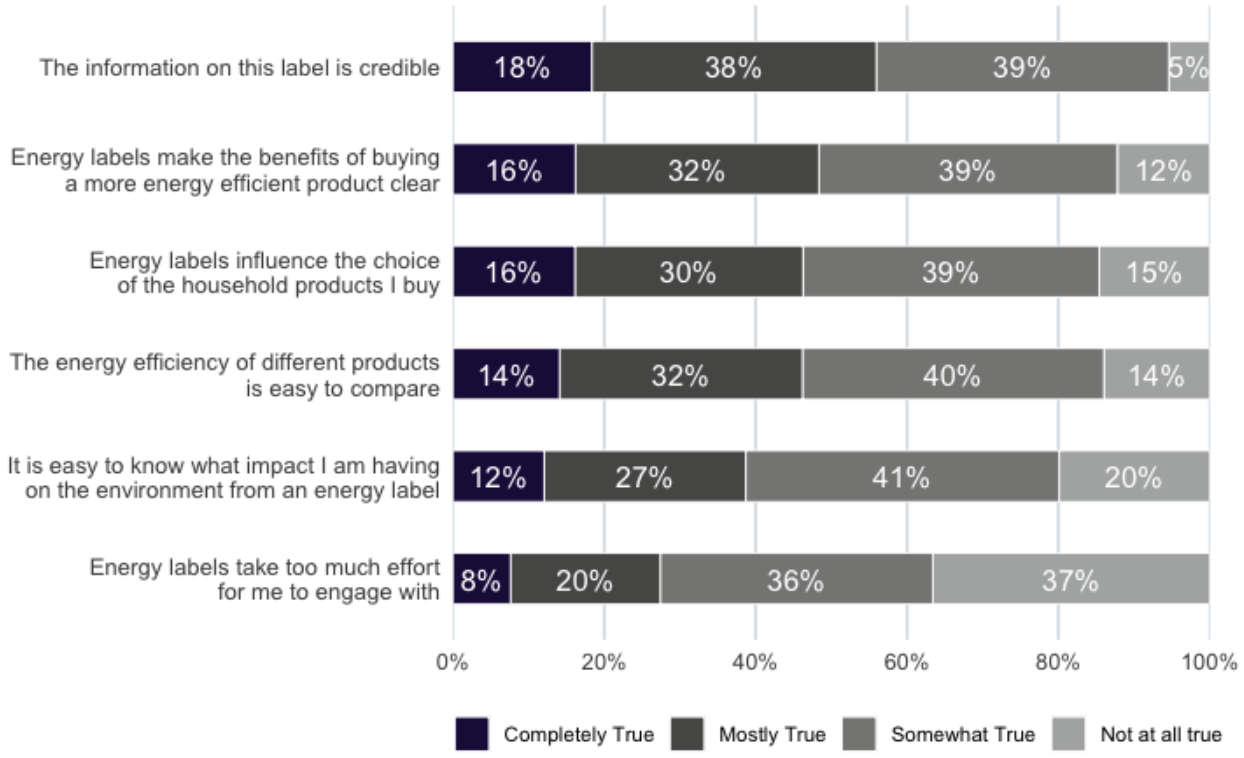
Figure 16: Confidence about the meaning of the A-G rating, the kWh value, and the symbols on energy labels



Attitudes toward labels

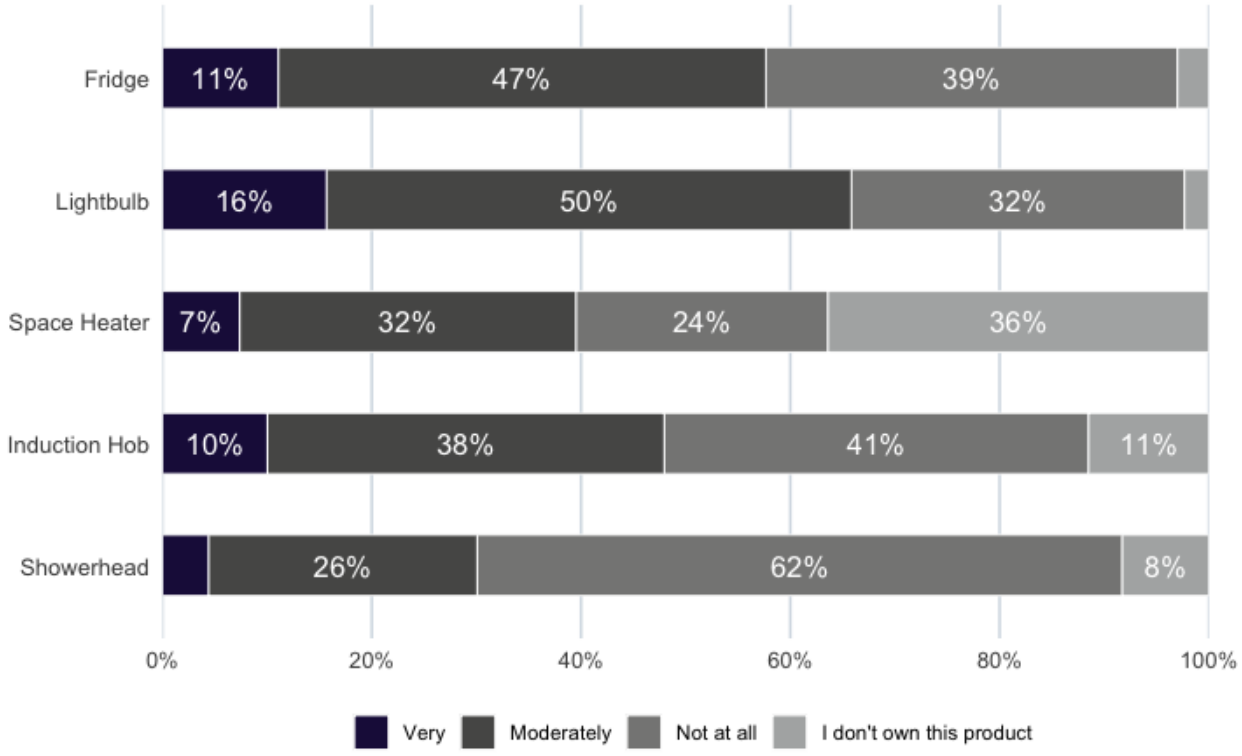
After asking participants about specific elements of the labels, we asked them a few questions about their overall attitudes toward labels. Figure 17 shows participants' answers to these questions. As discussed in examining responses to earlier questions, participants generally thought the labels were credible but found it harder to translate the information on the energy label to the level of impact using the products would have on the environment.

Figure 17: Attitudes towards labels: Participant responses when asked how true they believed the following six statements were



Despite the presence of energy labels, few were ‘very confident’ in estimating energy efficiency of any of the products, as shown in Figure 18. Participants were most confident about interpreting light bulbs’ energy labels and least confident about shower heads and heaters – perhaps because they are less frequently purchased products.

Figure 18: Confidence in estimating the energy efficiency of products



4. Qualitative interviews

4.1 Methodology

4.1.1 Interview recruitment

We conducted qualitative research with 10 individuals to further explore how consumers interact with energy labels while purchasing electrical household appliances. These interviewees were all randomly selected from a pool of consenting participants identified during the survey phase of this research. The interviewees had already completed the survey and choice experiment (discussed in Sections II and III), therefore it is important to note that their views on energy labels may have been informed by this phase of the research. Moreover, it is noteworthy this sample does not capture people who do not have access to the internet or those individuals who do not partake in online surveys. Given that participants in this sample have self-selected to partake in interviews, they may be more extroverted, open to new experiences, and potentially more interested in the interview topic than others, which we note as a possible limitation.

Finally, it is essential to note that with a sample size of just $N = 10$, findings from these interviews should not be over-generalised as representative of the UK population. Instead these findings should be used to guide further research and understand potential nuance around how some people may use energy labels. In this section, we describe our methodology for sampling, data collection, and analysis.

4.1.2 Interview sample

Our recruitment criteria was designed to reflect the demographics of the general population and the variation in consumer shopping habits and pro-environmental motivations. Specifically, our sampling criteria are shown below in Table 8. We were able to meet the majority of our sampling criteria, though were unable to reach the target sample for certain criteria (including participants with an income < £20,000, were not aware of energy labels, and were not homeowners).

Table 8: Sampling criteria and Interview sample

Participants (n=10)		
Primary criteria		Final sample (target sample)
Annual household income	> £40,000	4 (minimum 2)
	£20,000 - £40,000	5 (minimum 2)
	< £20,000	1 (minimum 2)
Awareness of energy labels	Aware	9 (minimum 4)
	Not aware	1 (minimum 2)
Where do they shop for appliances	Mainly online	6 (minimum 2)
	Mainly in-store	4 (minimum 2)
Secondary criteria		
Sex	Male	6 (minimum 3)
	Female	4 (minimum 3)
Homeowner?	Homeowner	9 (minimum 4)
	Non-homeowner	1 (minimum 2)
During the survey phase, did the participant select energy efficient appliances	Yes (2 or 3 energy efficient appliances selected)	7 (minimum 2)
	No (0 or 1 energy efficient appliance selected)	3 (minimum 2)

4.1.3 Data collection

In November 2021, we conducted ten 30-minute interviews with participants. Interviews were structured according to an interview guide and were conducted virtually via the video conference software Google Meet. We developed a structured response sheet for recording interviewees' answers to enable us to collate and analyse interview data more quickly. We also made audio recordings so that we could refer back to transcripts for any details of the interview which weren't captured in the response sheet.

4.1.4 Analysis

Drawing on transcripts and notes from interviews, we conducted a thematic analysis of the interview data to draw out the key findings on the impact of energy labels on the electrical household appliance consumer journey. The themes were based on the key research questions that were identified and prioritised following the survey and choice experiment to explore specific themes.

4.1.5 Research question for the interview

The qualitative interview research questions were prioritised after quantitative survey and choice experiment in order to further explore areas of particular interest. These research questions were:

1. What is the consumer journey for electrical household appliances? Focussing on:
    a. How do energy labels feature in the consumer journey?
    b. Are consumer journeys the same online and offline?
2. What does energy efficiency mean to the consumer?
3. How do the pros and cons of the energy labels shape purchase of energy efficient products?
    a. What do consumers like about the label?
    b. How do 'confusing' elements of labels impact self-report purchase?

4.2 Findings

In this section, we report the key findings from our qualitative research exploring how consumers interact with energy labels while purchasing electrical household appliances. Full findings are summarised in table 9.

Table 9: Summary of key interview findings and illustrative quotes

Theme	Finding	Quote
RQ1: The consumer journey	During the purchase journey, interviewees largely prioritised product utility features and functions (e.g. bulb shape, fridge capacity or size) and product upfront price over energy efficiency.	*"I would maybe think about whatever [energy efficiency] rating [the products] got, but first of all, it's going to perform its function and be a fair price" [INTERVIEWEE 1].*
	Online searching: Interviewees searched pragmatically and generally for products, often including main product preference criteria in their search terms (e.g. 'brand', 'cheap', etc.), rarely including energy efficiency.	One interviewee said they *"would go into Google and open up about thirty thousand different tabs,"* and said that *"it was not very systematic" [INTERVIEWEE 4*].
	Online comparisons: Interviewees compared different products based on their personal priorities (e.g. price, brand), not by energy efficiency naturally. They used retailer websites, manufacturer websites, and even second-hand platforms such as eBay.	"*Amazon is the 'go to' because I don't have to pay for delivery. If they haven't got the products that I need, then obviously I'll go to other sites, like Currys or John Lewis" [INTERVIEWEE 2].*
	Identifying energy efficiency online: Interviewees highlighted that many websites allow users to filter by product energy efficiency directly during a search and highlighted that energy efficiency information can always be found in the product description section for product.	Interviewees explained that *"you can filter for energy rating on the left-hand side" [INTERVIEWEE 7]* *"Energy use info is normally in the product description" [INTERVIEWEE 2]*"
	Consumers trust online info about energy efficiency.	One INTERVIEWEE said that "*we have trust in what we read about products. I'd like to think that the requirements of firms to provide this information have some sort of parameters that need to be proved or otherwise" [INTERVIEWEE 1]*
	Consumers need to be proactive to look out energy labels online. It is not necessarily in each consumer's journey.	It's "*more down to the consumer to really try to be a bit more proactive to be a bit more energy efficient*," [INTERVIEWEE 7].
	In store product comparisons: Consumers knew that energy labels were on the side of products but found comparing products for their energy efficiency less convenient when in store.	One interviewee explained that energy labels can be found "*on the side of the box or appliance there's a little sticker where it tells you the energy*" *[INTERVIEWEE 7].* However, when shopping in store for a light bulb, she mentioned that "*I didn't quite understand what was what,*

Theme	Finding	Quote
		they weren't really organised into a category or anything" [INTERVIEWEE 3].
	Consumers said they do not properly attend to energy labels in store	*"Even when those labels are on there, I look at them and I think 'that's a good rating' and I don't really look beyond that." [INTERVIEWEE 1].*
RQ2: What energy efficiency means to the consumer.	Consumers use 'energy efficiency' as an approximate indication of 'running cost effectiveness'	*"I think the primary thing for us is making sure it is energy efficient for the cost. I mean, it saves us in the long run on electricity costs." [INTERVIEWEE 4].*
	However, consumers are unable to quantify by how much they will save, despite claiming energy efficiency is all about cost. Consumers use labels as a rough approximation for how expensive bills will be.	One interviewee mentioned that, when using more efficient product "*your bills are going to be cheaper*", but said that "[she doesn't] *know by how much you can save money*" *[INTERVIEWEE 6]*
	Consumers are more influenced by upfront cost than by running cost	I "*think most people aren't looking ahead in time",* and that if they "*get offered a replacement [appliance] for £300 rather than £500, they'll take it*", explaining that "*everybody is just thinking about what they've got in the bank this month*" [INTERVIEWEE 6].
	Consumers' environmental motivations are secondary to financial benefits, and often not mentioned.	*"Obviously, [energy efficiency] means cheaper running first, and secondly better for the environment*" [INTERVIEWEE 5]
RQ3: Consumer evaluation of the energy label	Consumers do understand the A-G rating and coloured bars.	*"I think the label is quite clear. I mean, green means good and red means bad. It's also similar to energy ratings you see on houses when you buy new houses and things. So I'm familiar with this." [INTERVIEWEE 8].*
	Consumers do not understand the kWh figure and find it confusing. Therefore, they tend to use the A - G rating and colour gradient scale when purchasing something and are not dissuaded.	One interviewee explained that kWh information is "*very confusing to me - I haven't got a kilowatt mind*" [INTERVIEWEE 3]. Another interviewee said: *"I tend to ignore the kilowatts and things like that… that kind of information I don't really fully comprehend. So I tend to just ignore that and look at the green and red label" [INTERVIEWEE 8].*
	Consumers may prefer 'running cost' information over kWh, though may prefer 'annual' over 'lifetime' running cost because it is more intuitive to use in day-to-day cost calculations.	Presenting 'cost' information *"would turn the rating into something that I understand more about, and that's pounds…" [INTERVIEWEE 1].* "*I think it would be a good idea if you put it annually, for example, how much it is going to be running costs per year?*" [INTERVIEWEE 7]

Homogeneity of findings: It is noteworthy to mention that the themes mentioned above were very homogenous and consistent between interviewees, despite the diversity between participant demographics. Interviewees tended to feel strikingly similar toward energy labels across RQ1 - 3 irrespective of many of the sampling criteria, however, where there is any slight trends of variation by sample criteria we have illuminated it below. It is important to emphasise that variation in this sample should not be over-generalised given the sample itself is small (*N* = 10), however variation can prompt further research questions. In the following sections we detail the above themes in greater detail.

4.2.1 The consumer journey and energy labels

To better understand how consumers factor a product's energy efficiency into a purchase decision, we explored their self-reported typical decision process and consumer journey. To do so, we asked questions about their aims and motives for purchasing products, methods for researching products, methods for comparing alternatives, and methods for identifying a product's energy efficiency.

Summary: Overall, the interviews showed that:

- Participants enter the household product consumer journey prioritising price and utility over energy efficiency, so it is not salient throughout the journey or searches.
- Participants do know how to identify energy efficiency online (through filters and product descriptions) and in store (through stickers on the sides of boxes), **but** do not necessarily check them during the process.
- Participants said that consumers need to be proactive to incorporate energy efficiency into their purchase journey.

Consumers tend to prioritise product cost and utility over energy efficiency

During the purchase journey, interviewees tended to prioritise product utility features and functions (e.g. bulb shape, fridge capacity or size) and upfront price over energy efficiency. When authentically prompted (without leading prompts about energy labelling), user goals rarely incorporated energy efficiency. One participant said: *"The cost is my thing, and then other factors like size. Overall, I ask: what size? What is the cost? That's my thing" [INTERVIEWEE 2],* which highlights the two priorities that interviewees have top of mind when beginning their search. This primacy of upfront cost was consistent across different sampling criteria in this phase of research, and price mattered to people across all income brackets.

Other interviewees further exemplified the primacy of upfront cost and functionality in user goals as they explained that they look for products that are "*good value for money but not cheap" [INTERVIEWEE 6]* or look for "*an offer on some [products]" [INTERVIEWEE 7]* – rather than mentioning anything to do with energy efficiency. The importance of product features to consumers was also captured well in the following quote from a participant: *"When we decided*

we needed a new fridge freezer, the first major consideration for us was fridge space" [INTERVIEWEE 1]. Overall, these interviews suggested that users enter the consumer journey largely deprioritising or ignoring energy efficiency and energy ratings.

Even after being prompted about energy efficiency, participants said that they still prioritised these other features during their search, and that energy efficiency rarely comes up as a conscious primary motive. For example, one participant said, *"I would maybe think about whatever [energy efficiency] rating [the product's] got, but, first of all, it's going to perform its function and be a fair price" [INTERVIEWEE 1].* This differs from the survey results, highlighting that energy efficiency could be a lower priority than demonstrated in the survey. Participants may have realised the lower priority of energy efficiency when transported more into the consumer journey during interviews, hence this difference. This discrepancy may also result from the tendency of interviews to foster more nuanced answers than some survey responses and follow up prompts in interviews offering an opportunity for more reflection, whereby participants can directly compare their priorities during consumer journey mapping. This could explain why participants report that energy efficiency is a lower priority in the interviews. There was little variation across demographic groups or other recruitment criteria.

During consumer journeys – both online and in-store – energy labels were not salient unless the consumer was proactive.

There were more similarities than differences between the online and in-store consumer journeys. Our 10 interviewees said that they understood well how to locate a product's energy label both online and offline, but that it was not salient in their minds (until prompted by our interviewer to consider how the energy label influences their decisions). It is worth noting that 9/10 of our participants indicated that they had heard of energy labels before, so this sample is possibly more attuned to energy labels in the consumer journey. However, 'energy label knowledge' may be expected since all the participants undertook the survey/choice experiment prior to this. Analysis of both online and in-store experiences follows.

A. Online consumer journey

Many interviewees said that household electrical appliance purchases often involved online shopping. The consumers we spoke to said they feel competent and confident to search the web for certain products that they want to buy. There were no demographic differences and this did not vary by sampling criteria - even those participants who pre-indicated that they shopped in-store were confident talking about online purchase. Most interviewees reported navigating online stores similarly across the following phases: 1) search phase, and 2) comparison and decision phase. Participants said they sometimes identified products' energy efficiency during these phases, particularly in conducting comparisons, but usually only when prompted by our interviewer about whether they consider energy efficiency.

<u>i. Online search phase</u>

Participants said that they did not undertake sophisticated or complex online searches, instead employing pragmatic and basic methods to search for products. Participants searched generally for products, often including main product preference criteria in their search terms

(e.g. the brand, 'cheap', etc.). For example, one participant explained that, at the beginning of a search online, they *"would go into Google and open up about thirty thousand different tabs,"* noting of their search process *"it was not very systematic*" *[INTERVIEWEE 4*]. This reflects the fairly unstructured approach that interviewees took consistently across sampling criteria and demographic groups.

ii. Online comparison and decision phase

Participants said they compared products based on their personal priorities (e.g. price, brand, functionality) by using retailers' websites, manufacturers' websites, review websites, and second-hand platforms such as eBay. Most interviewees mentioned initially searching for well-known online retailers when beginning their online shopping journey, *"Amazon is the 'go to' because I don't have to pay for delivery. If they haven't got the products that I need, then obviously I'll go to other sites, like Currys or John Lewis*" [INTERVIEWEE 2]. They also search on manufacturers' websites and second-hand selling platforms, comparing priority features across tabs. One participant said that they *"would go on to different [tabs] and just compare, compare, compare, eventually saying, 'right, we like that one'!"* [INTERVIEWEE 4]. The sites participants used did not differ across sampling criteria and demographic groups.

As noted above, interviewees rarely organically mentioned energy efficiency in these stages of their shopping journeys, instead focusing on upfront cost, brand, and functionality. That said, some interviewees did mention searching for value for money – which is discussed in section 2.2.

iii. Identifying the energy efficiency of a product online

Participants were generally confident and competent at identifying a product's energy efficiency online. Some participants said that many websites allow users to filter by product energy efficiency directly during a search. Participants explained that *"you can filter for energy rating on the left-hand side" [INTERVIEWEE 7]* if you *"specify in the search function the energy rating that you were looking for, like A+ or whatever it was you wanted."* This was confirmed by multiple participants, another said that the *"websites I visited actually gave you the option to put in the energy efficiency of the filter criteria. So it wasn't so difficult" [INTERVIEWEE10]*.

Some participants also correctly highlighted that energy efficiency information can always be found in the product description section for products (*"Energy use info is normally in the product description" [INTERVIEWEE 2]*"). There were no trends in demographic differences for these participants. One participant even highlighted that they knew that they could learn about a product's energy efficiency on the manufacturers website, saying they were willing to check "*the manufacturer's website, where they give you all the energy ratings and all of the other specs*" *[INTERVIEWEE 6]*. Overall, most interviewees said that they *"didn't struggle to find that information or anything. It was quite easy to find." [INTERVIEWEE 8].*

Participants said that they did trust the information presented to them online; they trusted that firms are being held accountable to provide accurate information. One interviewee said, "*We have trust in what we read about products. I'd like to think that the requirements of firms to provide this information have some sort of parameters that need to be proved or otherwise"*

[INTERVIEWEE 1]. Another noted, *"I put my trust in the company. They're not coming up telling me lies about it." [INTERVIEWEE 8].*

However, whilst consumers know where to find them, they don't necessarily check energy labels before purchase. Consumers said they need to be proactive to inspect energy labels; interviewees generally agreed that it is "*more down to the consumer to really try to be a bit more proactive to be a bit more energy efficient*," [INTERVIEWEE 7]. Even participants who selected all energy efficient products in the choice experiment (e.g. interviewee 1) agreed that they needed to make an effort to actually include energy labels in their consumer journey.

B. In-store consumer journey

Shopping in-stores, consumers did generally understand how to find energy efficiency information, but it was not necessarily part of their consumer journey due to motivational, salience, and access barriers. Generally, interviewees would go to the store with a user goal that was not to do with energy efficiency. This was, again, consistent across different demographic groups. Given similarities between the online and in-store consumer journeys, we have focussed just on identifying energy efficiency in store:

i. Identifying energy efficiency in store

Overall, interviews about in-store shopping indicated that, similar to online shopping, consumers do generally know how to find energy efficiency information in store by searching the side of appliances or asking shopkeepers, but that this information can be hard to locate in some instances and is not generally part of consumers' shopping journeys.

Consumers said that they found identifying and comparing products for their energy efficiency less convenient and less helpful whilst purchasing in stores. They did know that energy labels in stores can be found "*on the side of the box or appliance, there's a little sticker where it tells you the energy*" *[INTERVIEWEE 7].* This did not meaningfully vary by sampling criteria either, and even participants who previously stated that they did not know about energy labels said that "*I think they usually even have stickers on them* " *[INTERVIEWEE* 3].

However, interviewees explained that they tend not to look closely: *"Even when those labels are on there, I look at them and I think 'that's a good rating' and I don't really look beyond that." [INTERVIEWEE 1].* This quote reflects a sentiment found in many interviewees that, while in store, they do not generally engage with energy efficiency information as a priority. This was true across all sampling criteria, even of participants who had chosen 3/3 energy efficient products in the choice experiment (e.g. Interviewee 1 above). This reflects interview findings for the online consumer journey.

One participant mentioned that, in store, products were not arranged in intuitive ways and that it could be difficult to prioritise certain products, especially by energy efficiency. When shopping in store for a light bulb, she mentioned that "*I didn't quite understand what was what, they weren't really organised into a category or anything*" [INTERVIEWEE 3].

Nonetheless, interviewees tended to trust and depend on shopkeepers in store to educate and aid them with energy labels. One participant explained that "*if you go somewhere like Currys, you can ask for help and have [energy efficiency] explained*" [INTERVIEWEE 3].

4.2.2 What 'energy efficiency' means to the consumer

After exploring the household appliance consumer journey with interviewees, interviews next explored how interviewees thought about 'energy efficiency' more closely. Again, it should be noted that nine out of ten participants indicate prior knowledge of energy labels (and that each participant had been previously exposed to energy labels during the survey/choice experiment phase), which may shape perceptions and responses.

Summary: Interviews showed that:

- Participants used a products' energy efficiency to tell themselves about the cost effectiveness of its running cost.
- However, consumers would use energy efficiency as a rule-of-thumb approximation of running cost (e.g. cheap or expensive), as they were unable to estimate how much it actually cost to run products from their labels.
- Moreover, upfront cost was more important to people than running cost or energy efficiency; and environmental benefits were a secondary motivation.

Consumers use 'energy efficiency' as an approximate indication of 'running cost effectiveness'

When interviewees did mention energy efficiency unprompted, their comments usually related to reduced running cost, lower bills, and price benefits for themselves. One interviewee summarised the biggest benefits of energy efficient products: *"I think the primary thing for us is making sure it is energy efficient for the cost. I mean, it saves us in the long run on electricity costs.*" *[INTERVIEWEE 4].*

After prompting, others said that running cost is the only reason they might check a product's energy efficiency: "*So that's the reason why I kind of do look into energy efficiency when I am buying a product, so I know how it will impact my bills" [INTERVIEWEE 7].* These interviews reinforced the finding that personal benefits of energy efficient products (e.g. lower running costs) remain the main reason the consumers we spoke to engage with energy labels, as opposed to environmental benefits. Again, this theme did not seem to differ by sampling criteria, even Interviewee 5 (who chose 0 energy efficient products in the choice experiment) said that "*if a car had a ridiculous 'miles-per-gallon' rating, then it's going to use too much and cost [them] a fortune, and so [they] wouldn't buy it… energy efficient obviously means it's cheaper to run…"* to reference that they see energy efficiency through financial means and personal benefits.

Although interviewees said that they use energy labels to learn about expected impact on bills, they were unable to quantify this impact. One interviewee said that, when using more efficient products "*your bills are going to be cheaper*" but said that she didn't "*know by how much you can save money*" *[INTERVIEWEE 6].* Participants suggest that energy labels themselves do not make financial savings easy to interpret, arguing that they *"don't really make it clear in terms of how much you're going to save per grade," [INTERVIEWEE 7].* Interviewees generally used energy labels as a rough approximation / 'rule of thumb' – higher energy efficiency means lower bills, but interviewees said they were not making fine-grained calculated decisions.

Consumers do not naturally link 'upfront cost' and 'running cost' to understand the overall cost recuperation of a product

Despite the benefit of lower running cost associated with energy efficiency, interviewees still focused on the upfront cost of a product, rather than considering the recuperation cost (i.e. the overall 'whole life' price). Even when interviewees were asked about the running cost and recuperation cost, they still said that the upfront cost is more impactful on their decision. This may be due to a psychological phenomenon known as 'temporal discounting', which describes the tendency to prefer a smaller present reward to a larger later reward. One interviewee summarised this phenomenon by saying that they "*think most people aren't looking ahead in time",* and that if they "*get offered a replacement [appliance] for £300 rather than £500, they'll take it*", explaining that "*everybody is just thinking about what they've got in the bank this month*" [INTERVIEWEE 6]. This quote also highlights the possibility that some interviewees may also be more influenced by the upfront cost more (than the recuperation cost) because they lack sufficient upfront funds to buy a more expensive product for the sake of longer-term savings. However, this did not differ by demographic including income bracket: for example, interviewee 6 (quoted above) is not in the lowest income bracket.

Consumers' environmental motivations are secondary, and often not mentioned

When prompted, for some interviewees environmental benefits of energy efficient products were less persuasive during purchase decisions than personal benefits such as cheaper energy bills.

For example, one interviewee said, *"Obviously [energy efficiency] means cheaper running first, and secondly better for the environment*" [INTERVIEWEE 5], and another said that "*less power means the least cost to me and then the least cost to the environment" [INTERVIEWEE 1].* Many interviewees could link energy efficiency to climate change and carbon emission issues - one interviewee said that "*the advantage, obviously, to the environment is fewer greenhouse gases and lower emissions disadvantages" [INTERVIEWEE 6].* This was consistent across the sampling criteria - even participants who selected majority low energy efficiency appliances in the choice experiment knew the impact of products on the planet (e.g. Interviewee 6 quotes above).

However, other interviewees were more likely to prioritise the environmental benefits of energy efficient products when making decisions. One interviewee said: "*I think probably the environment [is more important], because I think it is so much bigger than just saving, like, 20 pounds over the year?"* [INTERVIEWEE 8]. Notably, interviewee 8 (quoted here) is in the

highest income bracket, which may have impacted their priority for the environment over finances.

4.2.3 Consumer evaluation of the energy label

Next, interviewees were asked to discuss energy labels, after being presented with examples on screen. Participants were next shown a visual of the modified energy labels that contained running cost information in place of kWh information and were asked to react to the modified label. The findings from this section of the interview are discussed below.

Summary: Interviews showed that:

- Almost all interviewees find the A - G rating and the colour bar gradient useful and say they use it entirely to inform their decisions about energy efficiency.
- The kWh information does confuse participants, Click here to enter text.forcing them to rely further on the A - G rating. Therefore, whilst confusion about kWh is a limitation it does not necessarily dissuade purchase.
- However, behavioural evidence in the wider literature suggests that in most cases, superfluous information on labels can be distracting and damaging to behaviour change.
- Participants spontaneously suggest that including running cost information (annually) would be useful.

Interviewees did understand the A-G rating and coloured bars

Interviewees did understand how to interpret certain elements of the current energy labels – especially the simpler, more intuitive, and visual elements of the label. Interviewees generally understood and appreciated the A-G rating as an indicator of 'good - bad', and they said the colour scheme bar gradient was intuitive, too. For instance, one interviewee said: *"I think the label is quite clear. I mean, green means good and red means bad. It's also similar to energy ratings you see on houses when you buy new houses and things. So I'm familiar with this." [INTERVIEWEE 8].*

Interviewees did not understand the kWh figure and found it confusing

Overall, we found that consumers do not factor the numeric kWh information presented on energy labels into their decision-making. Instead consumers rely on the more intuitive elements of the energy labels (the A - G rating and colour gradient).

All interviewees agreed that the numeric information about a product's energy efficiency presented in kWh on the energy label was not possible to understand, confusing, and unnecessary. For example, one woman said that kWh information is "*very confusing to me - I haven't got a kilowatt mind*" [INTERVIEWEE 3].

Some interviewees told us they would just ignore the confusing kWh information, so it did not

seem to make them less likely to engage with the label or buy an energy efficient product. For example, one interviewee explained their process of ignoring the kWh information by saying *"I tend to ignore the kilowatts and things like that… that kind of information I don't really fully comprehend. So I tend to just ignore that and look at the green and red label" [INTERVIEWEE 8].* However, behavioural evidence in the wider literature suggests that in most cases, superfluous information on labels can be distracting and damaging to behaviour change as it impedes processing fluency.

Some participants summarised that people would be able to interpret financial information more fluently than kWh information: *"People aren't going to recognize the 257 kilowatts per annum… People would find it easier if there was a cost on it of what it roughly would cost" [INTERVIEWEE9].*

Consumers may prefer 'annual' running costs to 'lifetime' running costs, and over kWh information

Participants in this sample said that the 'lifetime cost' label is an improvement on the existing 'kWh' label. All interviewees said that this information is clear, understandable, and makes it easier to compare products on energy efficiency. One interviewee summarised this well by explaining that presenting 'cost' information *"would turn the rating into something that I understand more about, and that's pounds…" [INTERVIEWEE 1].*

However, some interviewees also suggested that the running cost information would be even easier to use if it were presented in 'annual cost' rather than 'lifetime cost'. This is summarised by a quote from an interviewee who said, "*I think it would be a good idea if you put it annually, for example, how much it is going to be running costs per year?*" [*INTERVIEWEE* 7]. Interviewees suggested that it would feel more relevant to the present moment by making monthly bills easier to calculate, as highlighted by an interviewee who said "*if you can quickly calculate in your head how much it's going to cost you a year on top of your electricity bill or less on your electricity bill, that would be good*" [INTERVIEWEE 3] and another who said that *"For me personally, [annual cost] would give me a better idea of value for money" [INTERVIEWEE9].* It is certainly worth emphasising that this finding has emerged from interviews with a small sample of people (*N* = 10), and warrants further exploration (see recommendation 6).

Furthermore, some interviewees considered that it would be useful to display price and cost information at each gradient of the A - G rating scale. One interviewee explained that this was because "*people find it really hard to compare like for like with [the existing label], they would have to be looking at other [labels] to see whether that was expensive or whether it was cheap*" [INTERVIEWEE 5]. This interviewee argued that being able to understand comparative savings from viewing one label would be useful. Again, this idea warrants further investigation due to the small sample size of the qualitative interview section.

5. Conclusions

Before discussing conclusions and suggestions, note the limitations to our research stated in the main body of this report. First, experiment and survey participants were representative of the UK in terms of age, sex, income, and location, but did not include digitally excluded or people otherwise not inclined to complete online surveys. Second, experiment and survey outcomes were based on hypothetical choices that may be subject to social desirability bias and other sources of imprecision and bias such as ordering effects (the survey came after the experiment), and we generally interpret stated intent as an upper bound of real behaviour. Third, our qualitative interviews drew on a small sample (n=10); findings from this qualitative research should be interpreted as showing range and diversity of views rather than allowing us or the reader to draw quantitative conclusions.

Our survey and qualitative interviews both highlighted that upfront price is the most important factor in influencing consumers' product purchasing decisions. The survey results indicated that energy efficiency was also an important factor; however, the consumers we interviewed, somewhat in contrast to these results, rarely brought up energy efficiency unless prompted with questions about it as an influence on their decisions. Outside of these two factors, product quality and functionality were rated highly as influences on shopping decisions.

When asked to cite reasons why someone might purchase an energy efficient product, our survey results indicated that lower running costs and environmental benefits were roughly of equal importance. Our interviewees emphasised the importance of lower running costs more than environmental benefits, though some interviewees said that the environmental benefits of more energy efficient products would have a large impact on their shopping decisions.

When it came to barriers to purchasing energy efficient products, survey participants ranked most highly the perception of energy efficient products as having higher upfront costs. Interviewees did discuss this issue, but a larger emphasis was placed on simply not noticing energy efficiency ratings, when shopping both online and in store.

Survey participants and interviewees emphasised that, when they did look at energy efficiency ratings, they trusted them and were familiar with them. Many of the participants said they had seen fridge-freezer, light bulb, and induction hob labels before (whereas it was less common to have seen the shower head water labels – which makes sense given these are not in circulation).

The major barrier seems to be difficulty translating the information on the labels into financial and environmental impact, as found in both the survey and interviews. That is probably why we found a strong effect of the label redesign displaying products' 'lifetime costs' in monetary terms instead of displaying kWh/annum that are difficult to interpret. Relatedly, participants appeared to be more motivated by price savings (perhaps in combination with energy and environmental concerns) than by energy and environmental concerns alone.

As discussed in the introduction, previous experiments have found that providing more information can backfire. A 2014 study found that the full label least effectively promoted

consideration of more energy efficient products – it was outperformed by all 'reduced form' labels designed by the researchers.[21] Superficially, our finding is in some conflict with this idea. However, we hypothesise that the key is to include genuinely useful information, while being mindful about overloading consumers with too much information.

We make four policy-relevant suggestions in Table 10.

Table 10: Policy-relevant suggestions from research

Recommendation	Description
Recommendation 1: Increase salience of energy labels and energy efficient products in consumer journeys, both online and in stores, as well as via communication campaigns.	Consumers tend not to enter the consumer journey with energy efficiency in mind, so do not naturally prioritise it in their decisions to purchase products. There is an opportunity to target policies at raising awareness or increasing the general salience of energy labels in the consumer journey by: ● Encouraging physical stores to arrange products by energy efficiency or highlight high-efficiency products with special signage. ● Encouraging online retailers to sort products by energy efficiency by default and make 'filter by energy efficiency rating' features salient and easy to find. ● Encouraging online and physical retailers to display labels saliently, such as on the front of the product in store and within products' display images online. ● Designing and launching communication campaigns that raise awareness and salience of energy labels on products, ideally education on how to find information in-store and online.
Recommendation 2: Make energy labels easier for people to interpret and include consumer-relevant information.	Illustrate or replace kWh information with estimated running costs (perhaps in terms of annual costs or monthly bills) rather than costs over the 'whole lifetime' of the product. Where possible, emphasise immediate benefits of energy saving products, make differences in running costs salient, and/or connect these differences to customers' current expenditures on energy. This is true both for energy labels and water/energy labels. ● Our choice experiment indicated that 'whole life cost' causes some consumers to choose the more energy efficient product.

[21] Leenheer, J., Elsen, M., Mikola, N., van der Wagt, M., & Lloyd, L. (2014). Study on the effects on consumer behaviour of online sustainability information displays. *European Commission*.

	• Another option, favoured by some interviewees, would be to display the running cost information as in 'annual' form.
Recommendation 3: Use messaging highlighting personal financial benefits.	Emphasise personal financial benefits (e.g. savings) first; environmental benefits may be persuasive to some consumers but should probably be a secondary message.
Recommendation 4: Investigate the impact of making water usage 'relatable' on water labels – through financial or physical analogies.	We suggest investigating the impact on customer choices of water-using products of making water usage estimates 'relatable' – by illustrating the cost financially (combining the cost of water and of the energy required to heat the water) and/or through a physical analogy (e.g. number of bathtubs filled per use, or per year).

Finally, we include recommendations for further research.

Table 11: Suggestion for further research

Recommendation	Description
Recommendation 5: Test framing 'running cost' information as 'annual' vs. 'lifetime'	Given feedback from participants that they would find the 'running cost' information easier to interpret if it was framed as 'annual' running cost, we recommend undertaking further research to explore the relative impact of product choice when information is presented this way. This could be through repeating the 'choice experiment' used in this report, but presenting participants with labels framed differently, compared to a control.
Recommendation 6: Assess the impact of energy labels that include 'running costs' in a field trial	In order to gain further external validity, a further research phase would be to explore the impact of presenting 'running cost' information on energy labels to consumers on purchase in the real world, such as through a field trial comparing purchase of energy efficient appliances with different energy labels at physical or online retailers.
Recommendation 7: Research and explore how adding 'running cost' information to labels could be operationalised	Given that energy prices change over time, operationalising and implementing labels that accurately display average running costs may be difficult. Given this, further research could map and explore possible avenues and barriers to implementing this information on labels.

-

ANNEXES

Annex 1: Research questions

This project was phased sequentially so that research questions in phase 2 could be adapted to direct focus on findings from phase 1.

Phase 1 (Quantitative Survey and Online Experiment)

- Explore barriers to consuming energy efficient household products:
    a. Which are/are perceived as the most important behavioural barriers to consumer purchasing of energy efficient products?
    b. How do these vary between different product types?
    c. Do they differ when purchasing products online or in store?
- Exploring barriers and enablers relating to the energy label itself:
    a. What information on the label, or information presented to the consumer in the course of their customer journey, do consumers perceive as the most effective at influencing a customer to purchase a more energy efficient product?
- Enablers in the consumer journey. Are there existing enablers that encourage consumers to purchase more energy efficient product? For example:
    a. How and when (if at all) does the energy label feature within the decision-making process (for which products)?
    b. Are there other sources of advice (e.g., retailer advice, manufacturer website) which inform decisions?
    c. Do enablers vary depending on whether products are being purchased online or in store?
    d. Are there any enablers that specifically target higher upfront cost as a barrier?

Phase 2 (Qualitative interviews)

The qualitative interview research questions were prioritised after quantitative survey and choice experiment in order to further explore areas of particular interest. These research questions were:

4. What is the consumer journey for electrical household appliances? Focussing on:
    a. How do energy labels feature in the consumer journey?
    b. Are consumer journeys the same online and offline?
5. What does energy efficiency mean to the consumer?
6. How do the pros and cons of the energy labels shape purchase of energy efficient products?
    a. What do consumers like about the label?
    b. How do ‘confusing’ elements of labels impact self-report purchase?

Annex 2: Participant characteristics

	Primary Sampling Criteria			Secondary Sampling Criteria		
Interviewee	Household income	Energy label awareness	Where do they shop for appliances?	Sex	Homeowners hip status	How many energy efficient appliances did they select in the choice experiment out of 3?
1	£20 - £40k	Yes	I shop online and in store equally	M	Yes	3
2	> £40,000	Yes	I shop online and in store equally	M	Yes	2
3	< £20,000	No	Mainly in store	F	Yes	0
4	> £40,000	Yes	I shop online and in store equally	F	No	3
5	£20 - £40k	Yes	I shop online and in store equally	M	Yes	0
6	£20 - £40k	Yes	Mainly online	F	Yes	1
7	£20 - £40k	Yes	I shop online and in store equally	M	Yes	3
8	> £40,000	Yes	I shop online and in store equally	F	Yes	3
9	> £40,000	Yes	I shop online and in store equally	M	Yes	3
10	£20 - £40k	Yes	I shop online and in store equally	M	Yes	3

Annex 3: Consent form

Why do you need my consent?

We are asking you for your email address, which constitutes Personal Data under the UK General Data Protection Regulation (UK GDPR). We need your consent to be able to collect and temporarily store this information.

What will you do with my email address?

We may use it to contact you to invite you to a 1-hour video interview. The interviews are for research relating to energy labels of appliances. The interviews will be recorded and transcribed.

What do I do if I don't want to share my email address?

You can choose not to share your email address and continue to submit this survey. However, you will not be able to participate in the 1-hour interview.

When will my personal data be deleted?

We will delete your email address from our systems within 2 weeks of completing the study. Your choices in the survey will be retained for research purposes.

BIT will anonymise data for the following interview activities

- *Analysing & coding transcriptions*
- *Reporting*

The interview data (i.e. recordings and transcripts) will be deleted 2 weeks after project completion.

Can I withdraw my consent at a later point?

Yes. You can withdraw your participation at any point during the survey by closing the browser window. If you have already submitted your responses, please contact your panel provider to inform them that you want to withdraw your consent to participate in the study. They will get in touch with us and we will exclude your data from this research. If you have any questions about our data policy, please contact predictiv@bi.team

Behavioural Insights Ltd is the controller of your personal data. Please contact our Data Protection Officer at dpo@bi.team or by post at Data Protection Officer, Behavioural Insights Team, 4 Matthew Parker Street, London SW1H 9NP, if you have any questions about how we use your personal data, referencing the code UK101855.000. For more details about how we process personal data, please visit our full Privacy Notice.

Annex 4: Interview discussion guide

Introduction and background (5 mins)

Researchers introduce themselves:

My name is X (introduce other colleagues on the call). We are from a research organisation called the Behavioural Insights Team.

- *We are working with the Government's department for Business, Energy and Industrial Strategy to explore how consumers make decisions about buying household appliances and products, such as fridge-freezers, space heaters or lightbulbs.*

Aim of the interview:

- *The purpose of this short interview is to understand your experience buying these appliances – what made you buy one appliance over another, and what you considered important during that process.*

Discussion logistics:

- *The discussion will last up to 30 minutes.*
- *We would like to know your thoughts and understand your point of view - there are no right or wrong answers to any of our questions.*
- *If you feel uncomfortable answering a question we can just skip it. It is your choice whether you take part in the interview and you will not be disadvantaged if you decide not to take part. You can end the interview at any point or not answer any particular question, without giving a reason. Following the interview, you can also ask for anything you say to be removed from our research.*
- *If you later change your mind about anything you have said - let me know, that's absolutely fine too*
- *What you tell us today will be kept anonymous. This means when we share findings from interviews we will remove any identifiable information. The only time we would have to break confidentiality would be if something you say makes us concerned for your safety or someone else's, in which case we'd pass this along to the nominated safeguarding lead at the Behavioural Insights Team.*

Do you have any questions? Are you happy to proceed with the interview *[take verbal consent]*

Recording consent

- Are you happy for me to record the interview? Wait for consent

- RECORD THE INTERVIEW

- By consenting to this interview, you authorise us to share your data with key members of the research team at the Behavioural Insights Team. Are you happy for your data, including your responses to the interview, to be accessed by other key members of the research team? Wait for consent

- We write up our findings from our interviews. We may include anonymous quotes or a summary of your answers from this interview in a report, presentation or other deliverable, but all identifiable information such as names and names of locations will be removed. Are you happy for us to use your responses in any final research outputs? Wait for consent

The consumer journey (12.5 mins

Firstly, I'd like to know a little more about what specific household appliances you might have had experience purchasing in the past. For example, [REFER TO THE INTERVIEWEE INFORMATION to assess what products they have purchased], do you remember whether you have bought any of the following products, respond yes or no:

a. *Lightbulbs?*
b. *Fridge-freezer?*
c. *Space heater?*
d. *Hob?*

(Recall) Great, during this interviews, I'd like you to think about the time you purchased [product(s)]
(Hypothetical) Not to worry, instead let's imagine you are about to buy a [product]

1. *Can you take me through, step-by-step, that purchase experience, starting from when you realised you needed to buy one…..*
   What were the first steps you took to get the [product]?
   a. *Did you research the product?*
   b. *Did you go into the store? Or go online?*

2. *How did you narrow down to the specific product that you ended up buying?*
   a. *How did you research the product? (Online? And In store?)*
   b. *How did you compare products to alternatives?*
   c. *Online vs. in store?*

3. *What aspects or features of the product were most important to you?*
   a. *What other features matter to you?*
      i. *Continue asking.*
   b. *Prompt: Do you think about how much the product costs?*
      i. *What does 'cost' mean to you?*
      ii. *[Tease out 'lifetime' vs 'upfront cost']*
   c. *[if they do not mention 'label' or 'energy efficiency', then probe] Why not the label/or energy efficiency?*
      i. *Why do you not use the label to compare alternative products?*

---

4. *What do you expect of a product that is high "energy efficiency"? What about one that is low "energy efficiency"?*

5. *What does the term 'energy efficient' mean to you?*
   a. *Prompt: Does it mean…*
      i. *Quality?*

ii. *Durability?*
iii. *Cost savings?*
iv. *Carbon Emissions?*
v. *Environmental friendliness?*

6. *What are the benefits of a product that has good energy efficiency?*
    a. *Prompt: What does this mean for you? What is most attractive about a product being energy efficient?*
    b. *What are the disadvantages?*

---

7. *How would you go about finding out a product's energy efficiency?*
    a. *When you are shopping in the shop, what would you do to find a product's energy efficiency?*
    b. *What about online?*

8. *If at all, at what point do you start thinking about a product's energy efficiency?*

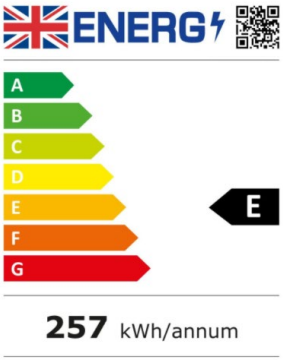
9. *What are the challenges to considering a product's energy efficiency during a purchase?*
    a. *What makes it hard? What are the barriers?*
    b. *Prompt: At what moment in your consumer experience do these problems with label comprehension occur?*

10. *Most standard electrical appliances have 'energy labels' on them, which inform the consumer about a product's energy efficiency. What do you think could be done to make you (and other people) pay more attention to a product's energy label?*
    a. *Prompt: In store - larger? Clearer? Advice from shop staff?*
    b. *Prompt: Online - displayed? Filtered by energy efficiency?*

The energy label (12.5 mins)

[Show energy label]

Price: £350.00



I am going to show you an energy label and ask you to interpret the information on it. You may recognise these labels from *:*

11. How easy or difficult is this label to understand?

a. *Can you interpret what the information and graphics on this label mean?*
b. *What does kWh/annum mean to you?*
c. *Understand energy efficiency?*
d. *How confident are you that you can understand this label?*
e. *How useful is the information on the label?*

12. How would you use this information to make a purchase decision? Or would you ignore it?

a. *Given what you have just said about the label, do you think you would ever use them to inform a purchase decision? Does the complicatedness of this label make it hard to engage with?*

13. How do you think this label impacts what you buy? If you saw this label

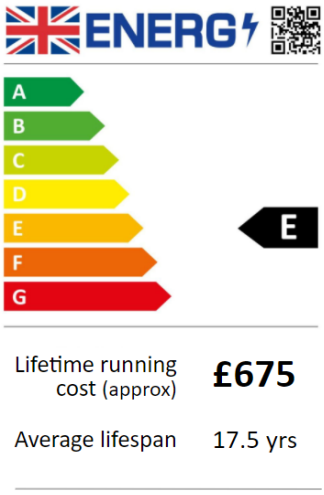
a. *Would you buy a product with information that you didn't fully understand on it?*
b. *Would this put you off purchasing?*
c. *Too confusing?*

14. What features of this label do you think are good?

a. *Prompt: What is easy to understand?*

[Show treatment label]

Price: £350.00



14. What do you think of this label?

- *a. How easy or difficult is it to understand?*
  - *i. Lifetime running cost/ Average lifespan.*
- *b. Compared to the previous label I showed you?*
- *c. How would you use this label?*

15. Can you think of any improvements to this label?

"Here, we have provided price and cost-saving information on the label hoping it would encourage consumers towards buying more energy efficient products."

16. Can you tell us more about how you feel when you see this label?

- *a. Does it make you more attracted to the energy efficient product?*
- *b. Do you understand what the relationship between cost and energy efficiency is?*

17. Would you mind if cost information like this appeared on energy labels? Why?

- *a. Prompt: Is it acceptable? Why?*

18. [If they were shown the information] In the survey did you notice the price information on the labels? Can you tell me about that?

19. Can you think of any other methods or ways of changing these labels to encourage people to buy more energy-efficient appliances ?

Close

Do you have any questions on what we have covered in the interview?

[You can round off the interview by summarising the main points you learned from the interview, and ask the respondent if they want to comment.

Thank them for their time and reassure them of the anonymity of the responses, as explained at the beginning of the interview.

Thanks and wrap up.]

Annex 5: Quantitative survey questions

Welcome and thank you for participating in this survey.

Task: In this survey, we are going to ask you some questions about common household appliances. We'd first like you compare two products and select the option that you would prefer to purchase in the real world. We will then ask you some additional questions about your views and your past experiences.

Duration: The survey should take about 12 minutes to complete and requires your attention, so please only participate if you can dedicate this time.

Interview: At the end, you will also have the opportunity to express interest to be invited to a 30-minute online interview. Interviewees will be paid £30 for their time.

Please note that you cannot go back to previous pages.

Interview sampling questions

[EnergyLabelAwareness] Appliances (like dishwashers, lightbulbs, and washing machines) typically have labels which inform consumers about how much energy they use. Are you aware of these labels?

- Yes
- No
- Not sure

[pastProdPurch] Which of the following products have you bought in the past 10 years (for personal or household use, rather than for work)? (tick all that apply)

- [bulbs]Lightbulbs
- [fridgefreezer]Fridge freezers
- [spaceheater]Portable space heaters (small plug-in heaters)
- [showerhead]Shower heads (the piece of the shower that water comes out of when it is turned on)
- [hob]Electric or induction hobs (a stovetop hob, often made of glass, that conducts heat to the cooking pans)
- [none]None of the above

[shoppinghabitsIfYes] Show if ANY items are ticked in [PastProdPurch] **When buying home appliances such as these, where did you typically shop?**

- Mainly online
- Mainly in store
- I shop online and in store equally

[shoppingHabitsIfNo] Show if NO item are ticked in [PastProdPurch]. **When buying home appliances such as these, where would you choose to shop?**

- Mainly online
- Mainly in store

- I shop online and in store equally
- Not applicable - I do not tend to buy these products.

[homeOwnership] Do you own (or co-own) the property that you currently live in?

- Yes
- No

[Online Experiment] Participants undertook the online experiment

[1] Household product purchase

Outcome measures
Hypothetical purchasing Behaviour

[FutureRes] Imagine that you wanted to buy [PRODUCT CATEGORY]. How would you find out more information about which product to buy? Please tick all that apply. [randomise order]

- [retailer] Online, on a retailer websites (e.g. Argos, Curry's, Amazon, John Lewis)
- [manufacturer] Online, on manufacturer websites (e.g. Bosch)
- [comparison] Online, on comparison websites (e.g. Which?)
- [secondh] Online, across second hand website (e.g. Gumtree)
- [personal] Online, on social media websites (e.g. blogs, YouTube)
- [storeSelf] In the store myself
- [assistance] Seek advice from sales assistance at the store
- [Other] Open text: Other, please specify.

[FuturePurch] If you were to purchase [PRODUCT CATEGORY] today, where would you purchase the product? [randomise order]

- Online, on a retailer websites (e.g. John Lewis, Argos, Curry's)
- Online, on comparison websites (e.g. Which?)
- Online, across second hand website (e.g. gumtree)
- In store
- From a second hand store

Outcome measures
Rating / Ranking of Barriers to purchasing [PRODUCT CATEGORY]
[RatePRODUCT]
Imagine you wanted to buy a PRODUCT. Please choose up to 5 factors from the list that most influence your choice. [randomise order]

- [price]Price
- [brand]Brand
- [size]Size
- [PRODUCT SPECIFIC FEATURE x3]

- [desig]Design and aesthetics / fit with current interior (e.g. colour)
- [qual]Product quality (e.g. solid manufacturing)
- [funct]Product functionality (e.g. durability, reliability)
- [flex]Financial flexibility (e.g. deals, tax breaks, subsidies, loans)
- [which]Expert recommendations/reviews, such as from Which?
- [shop]Recommendations from shop owner/shop assistant
- [frien]Recommendations//reviews from friends and family
- [onlin]Online customer recommendations/reviews
- [effic]Energy efficiency
- [envir]Environmental friendliness
- [indep]Independent reviews (e.g. forums or YouTube

[new page]

[RankPRODUCT] Listed here are the factors you rated as most important. **Please rank them here from most important at the top, to least important at the bottom by double clicking each selection**. *Please double check your selections before proceeding*.

- Show selected attributes
-

[PRODUCT SPECIFIC FEATURES] tested across condition
Fridge freezer: [Loudn] Loudness (noise emissions); [Stora]Storage space volume; [Freez]Presence of a freezer compartment
Induction hob: [Zone]The number of cooking zones (“rings”); [Metho]Relevance for preferred cooking method; [Compa]Compatibility with existing pots and pans
Lightbulb: [Techn]Lighting technology (e.g. LED, halogen, fluorescent); [Brigh]Brightness/luminance; [Colou]Colour temperature
Showerheads: [water]Water consumption; [Flow}Presence of a flow restrictor; [Autom]Automatic stop/start features.
Space heater: [Space]Heating space size (e.g. 15 squared foot room); [max]Maximum temperature; [Timer]Automatic on/off timer setting.

[2] Pro-environmental purchase of household products

Promotors

[Promoters] We would like to ask you about reasons why someone might want to purchase an energy-efficient [PRODUCT].

Please rate how important you think these reasons are for someone who makes an energy-efficient purchase.

[randomise order]

- **[EnvironmentalMotive]** They care about their impact on the environment
- **[SaveMoney]** They believe that energy-efficient products are cheaper to run and more cost effective

over time

- **[Durable]** They believe that energy-efficient products will last longer
- **[InjunctNorm]** They believe that it is the right thing to do given the current urgency to reduce climate change
- **[DescriptiveNorm]** They believe that most people buy energy efficient products
- **[Sustainable]** They believe energy-efficient products are produced more sustainably
- **[Safety]** They believe that energy-efficient products are safer
- **[EasyEnough]** They think it is easy enough to interpret the energy efficiency of a product from its label

[Not at all important, Slightly important, Moderately important, Very important]

Pro-Environmental Barriers
Individual differences

People also may have different reasons why they do NOT buy energy-efficient products.

[SelectIndividualBarriers] Please select 3 of the following that you think most impact whether someone buys an energy-efficient [PRODUCT CATEGORY]
[Select 3 and rank question] [randomise]

- **[Identity]** They are not very eco-conscious
- **[EcoImportance]** Other factors of the product are more important to them (e.g. functionality, design, performance)
- **[ConsumerEnergyKnowledge]** They have poor knowledge about products' energy efficiency
- **[ConsumerEnvironmentKnowledge]** They do not know about environmental sustainability
- **[ConsumerEnvironmentalSelfEfficacy]** They think that energy-efficient products do not make a difference to our environment
- **[AlreadyDo]** They already do enough to protect the environment (e.g. they are vegetarian or donate to environmental charities)
- **[Procedural]** They don't know where to start looking for energy-efficient products
- **[MotivationEco]** They don't care about buying sustainable products
- **[NoveltyAversion]** They are not confident in buying energy efficiency products because it is new to them

[RankIndividual] Below are the reasons you selected above. Please rank them here from most important at the top, to least important at the bottom by double clicking each selection. *Please double check your selections before proceeding*.

- Show selected attributes

Pro-Environmental Barriers
Product

[SelectProductBarriers] People's choices are also influenced by the qualities of the product themselves. Please select 4 of the following that you think most impact whether someone buys an energy efficient [PRODUCT CATEGORY].
[Select 4 and rank question] [randomise]

- **[TrustPerceptions]** They do not really trust the product energy efficiency claims
- **[LowQualityPerceptions]** They think that standard products work better than energy-efficient ones
- **[UpfrontCost]** They think that energy efficient products are usually more expensive than standard products.
- **[CostUnderstand]** They do not understand that it is cheaper to run energy efficient products
- **[Product knowledge]** They aren't aware of a product's energy-efficiency when they buy it
- **[ProductEnergyProcedure]** They do not understand how to find out how energy-efficient a product is
- **[show for showers][ShowerQual]** They worry that they will have a less enjoyable shower with an energy efficient shower head
- **[show for showers] [ShowerSoap]** They worry that a less powerful showerhead will mean it will take longer to wash, so they will use more water
- **[show for light bulbs][LightQual]** They think that energy-efficient light bulbs are not as bright
- **[show for light bulbs] [LightColour]** They do not like the colour of energy-efficient light bulbs (e.g. yellow vs.white light)
- **[show for heaters][HeaterQual]** They are worried that an energy-efficient portable space heater would not keep them warm
- **[show for heaters] [HeaterSize]** They are worried that an energy-efficient portable space heater would be bigger and less aesthetic
- **[show for hobs] [HobElectricity]** Induction hobs and stovetops run on electricity, which is more expensive than gas.
- **[show for hobs] [HobCulture]** They worry that electric/induction hobs do not work as well for the way they like to cook
- **[show for fridge freezer] [FridgeQual]** They are worried that an energy-efficient fridge freezer would not keep their food cool enough
- **[show for fridge freezer] [FridgeBelief]** They don't believe that a fridge freezer can really be energy efficient

[RankProducts] Below are the attributes you selected above. Please rank them here from most important at the top, to least important at the bottom by double clicking each selection. *Please double check your selections before proceeding*.

- Show selected attributes

Pro-Environmental Barriers
The shopping environment

Thank you for your answers so far! The shopping experience can also shape whether someone buys energy-efficient appliances.

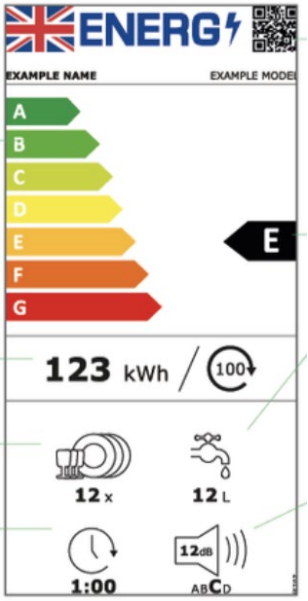
[RankShopStore] This question concerns shopping *in-store*. Please rank the following reasons that impact whether someone buys an energy-efficient [PRODUCT CATEGORY], from most important to least important.
[randomise]

- **[InaccessToInfoStore]** A product's energy efficiency is not clear enough (or easy to spot)
- **[PerceivedSearchTime]** People don't always have time to check a product's energy efficiency
- **[PerceivedSearchEffort]** People find it takes too much effort to search for a product's energy efficiency
- **[LackShopSupport]** There is a lack of support and guidance from staff about product energy efficiency in store

[RankShopOnline] The following concerns shopping *online*. Please rank the following reasons that impact whether someone buys an energy efficient [PRODUCT CATEGORY], from most important at the top to least important at the bottom by double clicking each selection. *Please double check your selections before proceeding*.
[randomise]

- **[PerceivedSearchTime]** People don't always have time to check a product's energy efficiency online
- **[PerceivedSearchEffort]** People find it takes too much effort to search for a product's energy efficiency online
- **[LackOnlineSupport]** It is not easy to filter online searches for energy efficiency while shopping
- **[InaccessToInfoOnline]** Websites don't make a product's energy efficiency clear enough (or easy to spot) online

Pro-Environmental Barriers
Energy labels



Below is an example of an energy label for [PRODUCT CATEGORY].
[SelectELBeliefBarriers] Please have a look at it and select 3 reasons why the label would NOT encourage people to buy an energy-efficient [PRODUCT CATEGORY]? [randomise]

- **[Complex]** Energy labels are hard to understand
- **[True]** The information on the label is not trustworthy
- **[Matter]** It is not clear why the information on this label matters
- **[InfoMuch]** The label has too much information
- **[Text]** It is not clear what the symbols mean

[RankELBelief] Below are the attributes you selected above. Please rank them here from most important to least important.

- Show selected attributes

Rank overall

[RankOverall] Thank you for your answers so far! Below are your top reasons that people do not buy energy-efficient products. Please rank them against each other, from most important to least important. You can rank your answers by double clicking on the reasons listed on the left. Please start with the most important reason.

Show top 2 ranked responses from [RankIndividual]
Show top 2 ranked responses from [RankProducts]
Show top 1 ranked responses from [RankShopStore]
Show top 1 ranked responses from [RankShopOnline]
Show top 2 ranked responses from [RankELBelief]

Beliefs and attitudes
That consumers have about other ideas

[same page as before, so that people can refer to the list when thinking about what's missing]

[fbPro] Can you think of any other reasons to purchase energy-efficient [PRODUCT CATEGORY]?

[fbConta] Can you think of any other reasons to not purchase energy-efficient [PRODUCT CATEGORY]?

[fbOpenOnlineImprove] Do you have any suggestions for online retailers that you think would make it easier for consumers to purchase energy efficient products?

[3] Energy label moment

Outcome measures
Product-Specific Energy Label Knowledge / Sentiment

[LabelKnow] Before this survey, had you ever seen the following type of energy label on a [PRODUCT CATEGORY]?

[show example image of a relevant product label]
[Yes / No / Don't know]

[efficient] How energy-efficient would you rate this [PRODUCT] according to the A-G rating? [Very inefficient/ Somewhat inefficient / Moderately efficient / Very efficient / Don't know]

[confRating] How confident do you feel about the meaning of the A-G rating? [Not at all/ A little / Moderately / Very]

[LabelUseful] Please indicate what element of the energy label is most useful and informative for you, tick all that apply.

- **[Scale]** The A-G color rating scale
- **[Symbols]** The symbols
- **[QR]** The QR code
- **[Kwh]** The kWh value

[show example image of symbols]

[SymbolMeaning] What do you think the following symbols mean? **[Open text response and show images of the product category symbols]**
[SymbolMeaning1]
[symbolMeaning2]
[SymbolMeaning3]
[SymbolMeaningX]

[symbols] How confident do you feel about the meaning of the symbols? [Not at all/ A little / Moderately / Very]

[kwhConfident] How confident do you feel about interpreting the kWh value?
[Not at all/ A little / Moderately / Very]

[qrscan] Have you ever scanned the QR code to find out more about a product? [Yes / No / Don't know]

[onlinet] Do you know where to find energy labels online? [Yes / No / Don't know]

[inStore] Do you know where to find energy labels in-store? [Yes / No / Don't know]

[fbLabel] Do you have any other feedback about the label? (optional)

[conf] How confident are you that you know the energy efficiency of your current PRODUCT?

[I don't own this product/
Not at all/ A little / Moderately / Very]

Outcome measures
Product-Specific Energy Label Knowledge / Sentiment

[RateEcolabelFeatur] How true are the following statements about energy labels? [randomise]

- **[ELImportanceQ]** *Energy labels influence the choice of the household products I buy*
- **[Comparability]** *The energy efficiency of different products is easy to compare*
- **[Credibility]** *The information on this label is credible*
- **[ImpactConceptualisat]** *It is easy to know what impact I am having on the environment from an energy label*
- **[RationalInattentionREV]** *Energy labels take too much effort for me to engage with*
- **[Clear]** *Energy labels make the benefits of buying a more energy efficient product clear*

[Not at all true, Somewhat True, Mostly True, Completely True]

Outcome measures: *Attitudes about enablers*
[EnablersInterventions] We have thought of some ideas that could help encourage people to buy more energy-efficient products. Please rate these ideas based on how effective you think they would be. [randomise]

- **[Deal]** Deals on energy-efficient products in store and online
- **[Guarentee]** Longer guarantees on energy-efficient products (e.g. cheaper running cost guarantees)
- **[Savings]** Displaying lifetime saving information on all products (e.g. "this product will save you £100 over its lifetime")
- **[Advert]** Adverts and educational campaigns promoting more energy-efficient products
- **[Simplify]** Simpler energy labels
- **[ProductGrouping]** Group products in store so that energy efficient products are together
- **[SiteFeatures]** Features on online sites to make it easy for people to compare home appliances for their energy efficiency (e.g. filter criteria)
- **[ShopShopkeeper]** Guidance from shopkeepers in store to make it easy to compare home appliances for their energy efficiency
- **[Impact]** Make the impact on the environment more obvious (e.g. carbon emissions per year)
- **[Gov]** A government-endorsed list of the most energy-efficient appliances on the market
- **[Tax]** A tax on the least energy-efficient products, to encourage manufacturers to phase them out

[Not very effective, A little bit effective, Moderately effective, Very effective]

This publication is available from: www.gov.uk/government/publications/exploring-the-effect-of-energy-labels-on-consumer-shopping-decisions

If you need a version of this document in a more accessible format, please email alt.formats@beis.gov.uk. Please tell us what format you need. It will help us if you say what assistive technology you use.