

# CONSUMER ATTITUDES AND GREEN SCEPTICISM TOWARDS ENERGY-EFFICIENT HOUSEHOLD APPLIANCES: FINDINGS FROM A PRELIMINARY STUDY

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## ABSTRACT

Customers are becoming increasingly conscious of the environmental implications of their behaviour, prompting businesses to incorporate information about the level of sustainability of the products they consume. Nevertheless, poor or inaccessible information might result in consumers' negative attitudes towards companies and concerns about the quality of their products, leading to mistrust, commonly referred to as green scepticism. Such belief can hinder the translation of consumers' sustainability awareness into actual behaviour, with potential consequences for the environment, society, and firms. Despite the rising awareness of green scepticism toward sustainable marketing, the literature in this field is still limited. This exploratory study sought to comprehend the attitudes of working-age adults towards high-energy efficient household appliances and their perceived green scepticism towards sustainability-related information provided by companies. Actual Italian consumers who had purchased a household appliance in the last six months were recruited for the study, as they could offer valuable insights into attitudes and beliefs towards energy efficiency. The study also investigated consumers' green scepticism towards information companies provide, such as energy consumption. Preliminary findings indicate that even highly educated consumers who are conscious of environmental issues and perceive themselves as knowledgeable about energy efficiency are distrustful of the sustainability-related information provided by companies and experts in the field. The lack of clear information conveyed to consumers could exacerbate their scepticism, negatively influencing their decisions to purchase household appliances considering their energy consumption. The study offers several implications for companies and scholars, providing insights into overcoming green scepticism towards sustainable information of household appliances and encouraging more energy-saving habits.

## KEYWORDS

Energy consumption, Green scepticism, Sustainability, Household appliance, Green attitudes, Eco-anxiety

## 1. INTRODUCTION

As the urgency of environmental issues grows, promoting the consumption of sustainable goods has become an important objective for many institutions. "Green marketing" refers to marketing strategies that aim to reduce a product's negative environmental impact. These strategies include communication campaigns and the inclusion of information regarding a product's environmental impact, such as energy-savings or CO<sub>2</sub> emissions (Bhardwaj et al., 2023; Schwartz et al., 2020). However, green marketing initiatives are hindered by the increasing scepticism of consumers regarding the environmental claims of companies ('green scepticism'), due to the not-always clear definition of sustainability and information shared (Do Paço & Reis, 2012; Vlachos et al., 2013; Bhardwaj, et al., 2023). This lack of trust may be also a consequence of companies' irresponsible environmental conduct, such as making statements about sustainability, without taking real action, known as 'greenwashing' (Leonidou & Skarmneas, 2015). In 2009, a Eurobarometer Survey (EU) revealed that 48% of participants showed mistrust towards green marketing campaigns.

To date, research has primarily focused on positive drivers of green purchasing behaviour (Gho, 2016; Carrete et al., 2012; Atkinson & Kim, 2015). However, attention should also be given to the factors that hinder the purchase of green products. In recent years, the majority of studies have focused on the food industry, and only recently has the focus extended to the household appliance sector (Butt et al., 2022; Asif et al., 2022).

Further research is needed on consumer scepticism towards the environmental claims of companies, particularly in the context of energy efficiency and environmental choices (Raska & Shaw, 2012; Matthes & Wonneberger, 2014), to help firms and scholars design successful strategies and incentives to enhance energy-saving habits.

## 1.2 Related Work

As the urgency of environmental issues grows, consumers are becoming more conscious of the environmental impact of their actions (Dagher & Itani, 2014), and companies started to provide information about the environmental impact of their products to address these concerns (Schuitema & De Groot, 2015). Consumers may develop negative attitudes toward companies if the provided information is unclear or inaccessible. Specifically, green scepticism is related to consumers' distrust and questioning of the quality of "green" products, leading to negative assumptions about a company's values and decreased willingness to purchase (Nyilasy et al., 2014; Akturan, 2018).

Moreover, the rise in greenwashing, where some companies falsely claim their products to be environmentally safe, exacerbates consumers' negative attitudes towards companies (Mitchell & Ramey, 2011; Polonsky et al., 2010). Although environmental regulations exist, they are not adequately enforced, contributing to consumers' scepticism towards firms' green initiatives. Providing accurate information can encourage consumers' pro-environmental behaviours (Schuitema & De Groot, 2015; Schwartz et al., 2020). Evidence suggests that people with a high self-concept, green identity, and belief in the impact of personal consumption on the environment are more likely to purchase green products (Schuitema & De Groot, 2015). Despite concerns about environmental issues, consumers' attitudes may not always translate into actual green behaviour and purchasing decisions (Dagher & Itani, 2014). This may be due to ambivalent attitudes towards these products and towards companies (Al Mamun et al., 2018).

Further exploration of these factors could facilitate sustainable consumption and promote environmental responsibility. The Theory of Planned Behaviour (TPB), a social-psychological paradigm used to comprehend green behavior (Ajzen, 1991), has been widely used to measure green consumerism levels in the European Union and inform policy development (Rahimah et al., 2018). TPB states that behavioural intentions can be predicted by three sociocognitive variables: attitudes, subjective norms, and perceived behaviour control. The concepts of eco-knowledge and self-efficacy affect attitudes towards green products. When environmental knowledge increases, consumers are more concerned about their purchase decisions, which positively influences their attitude towards eco-friendly purchasing, as reflected in their behaviour (Zhao & Zhong, 2015; Tseng & Hung, 2013). Subjective norms and perceived behavioural control can affect an individual's beliefs in their ability to conduct behaviour and intention to buy green products based on situational and internal factors (López-Mosquera et al., 2014; Chen & Tung, 2014).

Based on the above theoretical and empirical premises, in this preliminary study, we aimed to understand working-age adults' attitudes toward high-energy efficient (HEE) household appliances, focusing on how they perceived greenwashing and scepticism towards sustainability information. We were also interested in their levels of eco-anxiety to assess their general concern regarding climate change, which has received less attention in the field of green purchases (Yang, 2021). Additionally, we intended to investigate their actual understanding of energy efficiency and appliance usage, which has been found to be significantly different from perceived knowledge in previous research (Pernice et al., 2022). Furthermore, the purchase phase has been investigated to determine empirically which attributes are most important to consumers when purchasing an appliance.

## 2. MATERIALS AND METHODS

### 2.1 Materials

A total of two questionnaires were conducted online. A brief description of both questionnaires follows.

First questionnaire and related sections: *Green attitude and green scepticism*

The questionnaire comprised 69 items grouped into five sections: Demographics, Attitude towards HEE household appliances, Green scepticism toward sustainability information regarding those appliances, Concerns about climate change, and Energy-efficiency actual knowledge. The Demographic section

investigated participants' backgrounds, namely gender, age, education, job position, monthly income, how many people they live with, their previous engagement in other household appliances purchases and finally, their willingness to purchase household appliances online (8 items).

The second section explored the respondents' attitudes and knowledge about HEE household appliances. Items were completed on a 7-point scale Likert ranging from 1 "totally disagree" to 7 "totally agree":

- **Attitude (ATT)**; The degree of consumer's favourable or unfavourable evaluation of the HEE household appliance (6 items adapted from Hossain et al., 2022).

- **Subjective Norms (SN)**; Social pressure exerted on consumers from the surrounding environment to perform, or not, a certain behaviour related to an HEE household appliance (4 items adapted from Isoack et al., 2018).

- **Perceived Behavior Control (PEB)**; Individual's degree of having the opportunity and ability to perform a "green" behaviour using HEE household appliances (5 items adapted from Bhutto et al., 2020).

- **Perceived Ecoknowledge (PEK)**; Consumer knowledge of energy efficiency issues (6 items adapted from Waris & Hameed, 2020).

The third section explored respondents' perceptions of sustainability information, their scepticism toward the sustainability information of HEE appliances and the social actors who can drive this information. On a 7-point scale ranging from 1 "completely disagree" to 7 "absolutely agree," respondents rated the following items:

- **Greenwashing (GW)**; The perception that the information regarding the sustainability of HEE household appliances is a tactic to manipulate consumers (6 items adapted from Nguyen et al. 2019).

- **Green scepticism toward Shop assistants, Companies, and Experts (GS)**; Untrusting the sustainability information that a shop assistant (4 items), a company (2 items), an expert (2 items) shares about the household appliances (adapted from Akturan, 2018).

The fourth section explored respondents' climate change worries using a standardised questionnaire (ECOANX). Items were scored using a 7-point scale Likert ranging from 1 "never" to 7 "always" (10 items from Innocenti et al., 2021).

In the final section, we aimed to explore participants' actual knowledge of energy efficiency by designing 8 *ad-hoc* true or false items. The items covered general information about energy efficiency, such as "Energy efficiency is the use of less energy to perform the same task or produce the same result" (4 items, of which 2 were true). We also included more specific information about how to use household appliances efficiently. One example statement was "Laundry is only completely clean at temperatures above 30°C" (4 items, of which 2 were true). These statements were based on information provided by the European Union in 2022.

#### Second questionnaire: Users' preferences during the purchase phase

The study utilised a pairwise comparison approach to investigate consumer choices concerning household appliances (Figure 1). A pairwise comparison is one of the most widely used methods for investigating consumer preferences in the field of sustainability (Kinoshita, 2020). This method consists in asking the respondent to compare two options at a time, and to choose their preferred one based on the predictor variables, called attributes and their attributes, the levels. The aim of the pairwise comparison is to determine the contributions of the attributes and their levels in the purchase.

**Which of these washing machines would you buy?**

<p>Energy efficiency class</p> <p>C</p> <hr/> <p>Price</p> <p>€ 429</p> <p style="text-align: center; color: #007bff;">This one</p>	<p>Energy efficiency class</p> <p>B</p> <hr/> <p>Price</p> <p>€ 779</p> <p style="text-align: center; color: #007bff;">This one</p>
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Figure 1. Example of pairwise comparison used in the study

In this study, respondents were asked to choose between two alternative washing machines (the most common appliance in Italy (according to Statista, 2023) based on several attributes, such as price, capacity, energy class, CO2, kWh, brand and their levels (Table 1).

The pertinent attributes and levels based on those attributes were identified based on the existing literature (i.e., Sonnenberg, Erasmus & Donoghue, 2011; Pernice et al., 2022). To ensure consistency with the current market demands, RStudio (R Core Team, 2021) was used to conduct a systematic web analysis of the three Italian main e-commerce and unrealistic options were eliminated. An average of 30 alternative pairs were shown to each participant.

Table 1. Pairwise comparison attributes and levels

Attribute	Levels
Energy class	A; B; C
Price	€ 829; € 779; € 429; € 379
kWh	175; 160; 145; 130
CO2	1500; 1000
Brand	Unknown; Known
Capacity	9 kg; 7 kg

## 2.2 Participants

The inclusion criteria to be part of the study were having purchased at least one large household appliance (e.g., dishwasher, refrigerator, washing machine) in the past six months and being of working age. The sample comprised 16 respondents (10 female, 6 male) with an average age of 39.31 years (SD = 12.55).

Concerning education, 25% of the respondents had a high school degree, 18.75% had a bachelor's degree, and 56.25% had a master's degree. With regard to income, 25% of the respondents had a monthly income below 1000€, 50% had a monthly income between 1000€ and 1499€, and 25% had a monthly income above 1500€.

The majority of employed respondents worked in the private sector (31.25%) or public sector (37.5%), while 25% were freelancers and 6.25% were small entrepreneurs. In terms of living arrangements, 37.5% of the respondents lived alone, 25% lived with one other person, and 37.5% lived with multiple people. Participants reported having bought at least one large household appliance in the last six months, with 56.25% purchasing a refrigerator, 37.5% purchasing a dishwasher, 31.25% purchasing a washing machine, and 18.75% purchasing an oven. Regarding their intention to buy household appliances online, 37.5% of the respondents preferred to buy online, 31.25% had no clear preference, and 31.25% preferred not to buy online.

## 2.3 Procedure

The study was conducted between December 2022 and January 2023. Questionnaires were pre-tested to minimise errors and potential misunderstandings. For participant recruitment, the researchers initially contacted acquaintances who had purchased large household appliances in the past six months. Once eligibility was confirmed, participants were sent a link to an online survey to complete both questionnaires. Subsequently, each participant was given the option to refer other eligible participants to the study. Participation was voluntary, and no compensation was provided. The study was approved by the local Ethical Committee.

## 2.4 Analysis and Results

All analyses were conducted using the software Rstudio (R Core Team, 2021). Non-parametric analyses were performed and the Benjamini & Hochberg (Benjamini and Hochberg, 1995) correction was applied.

To analyse participants' attitudes toward the energy-saving of household appliances and the perceived scepticism toward household appliance sustainable information, a series of one-sample Wilcoxon tests were run. In particular, we compared the scores that participants assigned to each dimension with the median value of the scale (Mdn= 4), which indicates a neutral attitude (Table 2).

Generally, the participants believed in their ability to make energy-saving choices (PEB), reporting to prefer buying HEE household appliances (ATT). They believed that they influence and were influenced by others (SN). They also reported to search for information about HEE household appliances and other

sustainability-related information, such as CO2 and water consumption (PEK). They did not perceive the sustainability-information regarding the HHE household appliances as a marketing strategy to manipulate the consumers (GW). However, participants reported a lack of confidence in both appliance companies and experts (GS: companies and experts), while their beliefs toward shop assistants seemed neutral (GS shop assistants). They believe that the information they release has the ultimate purpose of the sale. Finally, they reported high worry about climate change (ECOANX).

Table 2. Values of one-sample Wilcoxon tests comparing score with median (Mdn=4); values means, standard deviations and medians

Dimension	V	p (BH)	M	SD	Mdn
PEB	120	<0.01	5.93	0.99	6.1
ATT	136	<0.01	5.83	0.81	5.91
SN	128	<0.01	4.87	0.71	4.87
PEK	130	<0.01	5.12	0.94	5.33
GW	88	0.059	4.45	0.96	4.58
GS Shop assistants	53	0.665	3.96	1.46	4.12
GS Companies	69	<0.01	5.03	1.37	5.25
GS Experts	115	<0.01	4.55	0.99	4.45
ECOANX	92	<0.05	4.55	0.99	4.45

Exploring participants scoring based on their sociodemographic characteristics, we performed a between-subject analysis based on income, and whether or not they were actively engaged in other household appliances purchase. For the sake of brevity, we only reported the analyses that showed significant differences. The Kruskal-Wallis test was performed between the levels of monthly income (low VS medium VS high). The test identified that the PEB was significantly higher in those with high income compared to those with medium income ( $\chi^2(2) = 6.84, p = .03$ ). Surprisingly, GS towards experts was significantly higher in those with low income compared to those with high income, and medium income compared to those with high income ( $\chi^2(2) = 6.88, p = .03$ ). The Mann-Whitney tests was performed considering whether or not they were actively engaged in other household appliances purchase (yes VS no). Those who were not actively engaged had significantly higher scores of ECOANX ( $W=41.00, p = .04$ ). GW and GS towards the brand was higher in those who were engaged ( $W= 3.5, p = .01$ ;  $W=4.5, p = .02$ ) compared to those who were not. GS toward experts was significantly higher in those who were not engaged ( $W=42.50, p = .03$ ).

Frequencies and proportions were first calculated to describe the respondents' actual knowledge. We set the sufficient threshold to 50%, meaning that participants had to answer correctly to at least 50% of the items. Results show that 53% of participants did not know how to manage household appliances to the highest level of efficiency. Additionally, 77% of them were not aware about the negative environmental impacts associated with the waste of energy.

Finally, we analysed respondents' preferences concerning the characteristics of household appliances. An overall importance score was calculated to determine what the most important attributes were (Table 3).

The price was found as the most important within the attributes, while kWh was the less important attribute.

Table 3. Pairwise comparison. Attributes, Levels and Relative importance

Attributes	Levels	Relative importance (equal 100% in total)
Price	429 €	25,93
Capacity	9 kgs	17,97
Energy Class	B	17,78
CO2	1000gr	12,98
Brand	unknown	12,77
kWh	145	12,54

### 3. DISCUSSION AND CONCLUSION

This study is a first attempt to provide insights into the attitudes and perceptions of real consumers towards HEE household appliances and the sustainable information provided by manufacturers and experts. Overall, participants expressed concern about environmental issues and showed a high level of awareness regarding the energy efficiency of their household appliances. They also perceived themselves as capable of implementing sustainable and energy-saving behaviours. However, they found the sustainable information provided by manufacturers and experts to be ambiguous and potentially driven by sales purposes. In contrast, participants had a neutral perception of the role of shop assistants in providing information on energy-efficient products.

According to the literature, purchasing green household appliances may not directly influence future green purchases if consumers' attitudes towards the sustainable market are generally negative (Rahimah et al., 2018). As our results show, being engaged in the purchase seems to be not enough to reduce the scepticism toward sustainable information. Additionally, consumers reported that external social influence might play a key role in gathering information and shaping their energy-efficient habits. However, this information may not be accurate or helpful in promoting energy-saving behaviours. In fact, this could even reinforce incorrect habits and hinder sustainability efforts. Even though respondents were well-educated, their actual knowledge about sustainability and energy efficiency is often limited. A clear example could be their choice of the kWh as the least preferred characteristic in the purchase phase of a household appliance.

Fully comprehending the complexity of the sustainable information about the household appliances, such as energy consumption, could promote coherent purchase choices and enhance consumers' energy-saving behaviours in managing their household appliances. Further research in this field could be an additional step towards bridging the household energy efficiency gap (Kallbekken & Hermansen, 2013; Gamberini et al., 2012). Moreover, in line with the literature (Do Paço & Reis, 2012), our findings suggested that those attitudes are sensitive to sociodemographic characteristics, even if the sample was small. Companies and marketers need to improve their messaging and communication efforts around the energy efficiency benefits of their products, specifically addressing consumers' needs. Consumers would have more information regarding their appliances, but these have to be clear and reliable. Providing technical information to back up their statements could decrease consumers' negative attitudes towards companies and experts in the HEE household appliances market. Future research should focus on identifying effective communication strategies to promote sustainable and energy-saving-oriented behaviours among consumers.

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