




“Factors influencing carbon-labeled product purchase intentions: A case study in Vietnam”

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FACTORS INFLUENCING CARBON-LABELED PRODUCT PURCHASE INTENTIONS: A CASE STUDY IN VIETNAM

Abstract

This study aims to examine university students' intention to purchase carbon-labeled products in Can Tho City, Vietnam, as well as the main reasons driving the desire to purchase carbon-labeled products. A survey was conducted using quantitative analytic methodologies, and 234 students' responses were obtained using Google Forms during the third quarter of 2023. Before surveying student participants, ten educational experts crafted and reviewed a questionnaire. The questionnaire had three sections. Structural equation modeling (SEM) and SPSS are used to assess the data. This study analyzed independent variables such as sustainable consumption habits, the green halo effect, carbon label visibility, and climate consciousness to consider their impact on the dependent variable of purchase intention. To guarantee the dependability of these variables, Cronbach's Alpha was employed with a threshold set at 0.60. The findings demonstrate Vietnamese students' comparatively low level of understanding regarding carbon labeling. Only 45.7% of the 234 survey participants claimed to have heard of carbon labels, compared to 54.3% who said they had never heard of them. Furthermore, sustainable consumption habits and the green halo effect directly impact the intentions to purchase carbon-labeled products, in which sustainable consumer habits play the most critical role. Carbon label visibility and climate consciousness do not directly influence the intention to buy, but these factors contribute to increasing purchase intention.

Keywords

carbon labeling, consumer, environment awareness,
marketing, sustainable consumption, sustainability,
emissions, climate change

JEL Classification

D20, F60, A10, M10

INTRODUCTION

As worries about climate change grow, consumers strive to incorporate sustainability into their daily lives. Carbon-labeled products offer insight into emissions from production and use, greatly impacting consumer choices with heightened environmental awareness. In a quickly changing global context, there has never been a greater need to address climate change. Globally, people and societies are becoming more responsible due to the need to cut greenhouse gas emissions and transition to more sustainable activities. People are becoming increasingly aware that sustaining the planet necessitates a significant shift in consumption patterns toward sustainability as the effects of climate change become more apparent.

The importance of consumers is greater than ever in the face of these worries. Rising environmental consciousness among consumers can completely transform entire sectors of the economy and change the course of climate change. The preference for products that not only satisfy one's needs but also align with sustainable goals is an emerging trend in the consumer context as a result of this new perception.

Modern consumers seek out goods that are both environmentally friendly and functional. The notion of “carbon-labeled products” has gained significant prominence within this particular context.

Products with carbon labels are a noteworthy innovation in the fight for sustainability. These labels give customers important information about the quantity of carbon emissions produced during manufacturing and using the goods they are considering purchasing. With this knowledge, buyers can choose products with lower carbon emissions and help cut greenhouse gas emissions by making better-informed decisions. Essentially, goods bearing the carbon label close the distance between the personal preferences of consumers and the overarching objective of reducing global warming.

1. LITERATURE REVIEW

The theoretical framework of Hsu et al. (2015) integrates the existing body of research concerning the expectation-confirmation model and its application to online shopping. The model showcases how the role of habit moderates the connection between trust, satisfaction, and the inclination to engage in future purchasing behavior. It was discovered by Ji and Wood (2007) that customers’ habits might overcome their intentions and cause them to repeat habitual actions despite their best efforts. According to Amri and Prihandono (2019), the way of life significantly influences consumer choice. According to Chang et al. (2015), customers’ inclinations to buy technological goods are significantly influenced by their lifestyle choices. Hsu et al. (2015) found that the influence of other factors, such as trust and pleasure, on the likelihood of a repeat purchase is altered by habitual behavior.

The halo effect represents a cognitive bias where individuals favorably perceive attractive people’s personality traits or other attributes above those of less attractive people. This bias may also impact other industries, such as marketing and brand equity (Li & Jain, 2009). According to Nisbett and Wilson (1977), the halo effect is caused by extrapolating from a general sense to unknown qualities. Woo (2019) focuses on branding, trademarks, and product packaging when examining the halo effect’s uses in marketing. In the evaluation of Sony and Coca-Cola subsidiaries in South Korea, Oh and Ramaprasad (2003) identified overall and salient-trait halo, providing a more exact definition of halo and implementing it in international public relations. According to Kapoor et al. (2022), the “Natural” label halo effect has positively influenced customer purchase

behavior, perceived value, and willingness to pay for skincare products. Chong and Wong (2005), studying the halo effect in online auctions, suggest that emphasizing particular satisfaction criteria may have the greatest overall effects on customer contentment and positive spillover effects on other satisfaction traits. Grote and Matheson (2007) found evidence that the halo effect in lottery games happens and is caused by players trading their winnings for new tickets.

Consumers’ intentions to make green purchases are directly, favorably, and significantly influenced by eco-labels and green advertising (Nguyen-Viet, 2022). Carbon labels are more effective with a clear, eye-catching design (Zhou et al., 2019). Khandpur et al. (2018) examined how consumers interpret front-of-package labeling and their intention to buy. Although their analysis was primarily concerned with nutritional factors, it acknowledged that label design differences might affect consumer buying intentions. According to Khan and Lan (2019), consumers use the carbon label as a signal to evaluate a product’s extrinsic quality, and their attitudes and intentions to buy a product are influenced by how well they perceive the carbon label. According to Yeo et al. (2020), product packaging is the most critical element affecting consumers’ purchase intentions. Packaging text, picture, form, and color, according to Khuong and Tran (2018), have direct and indirect relationships with the buyer’s intent. The purchasing intention was highly influenced by visibility, emotional appeal, and workability (Khan et al., 2021). Consumers may strengthen behavioral control to reinforce the desire to purchase organic goods by enhancing the labeling system to provide more practical details, including the product’s advantages for one’s health, the ecosystem, and society (Aitken et al., 2020).

Ricci and Banterle (2020) discovered that significant climate change-related public events, such as Pope Francis' encyclical publication and the 2015 United Nations Climate Change Conference, have an influence on consumer behavior and understanding of the climatic and environmental effects of their daily decisions. Kim et al. (2016) discovered that customers' attitudes about mandated carbon labeling were impacted by how they perceived climate change in South Korea. The contrast in consumer readiness to invest in low-carbon labeling, whether voluntary or mandatory, is substantial, especially as many individuals gain awareness about the repercussions of climate change. According to Emberger-Klein et al. (2021), consumers' behavioral intentions toward consuming climate-friendly foods are positively impacted by their views about the environment and by subjective and societal standards. Environmental awareness significantly impacts the purchasing intentions of individuals interested in non-electric vehicles (Okada et al., 2019).

As examined in various studies, purchase intention is a multifaceted aspect of consumer decision-making that assesses the factors influencing the choice between different brands. Mirabi et al. (2015) argue that purchase intention is an invaluable tool for forecasting the buying process due to its intricate interplay with consumer behavior, perceptions, and attitudes. Understanding consumer behavior and predicting purchase intentions requires a comprehensive grasp of the beliefs, evaluations, and motivations that steer the buying decision (Fishbein & Ajzen, 1977).

One notable finding from Zhao et al.'s (2018) study is that, despite consumers' initial skepticism, a substantial majority express an intention to purchase carbon-labeled products. Duan et al. (2023) reveal that consumers are willing to pay extra for products with carbon information labels, even in cases where their comprehension of the system is limited. Furthermore, Liang et al. (2020) demonstrate that consumers with high levels of objective knowledge and perceived consumer effectiveness are more inclined to purchase products with carbon labels. Feucht and Zander (2018) find that consumers are willing to pay a premium for products bearing the "carbon-labeled" designation.

Liu et al. (2017) offer insights into various factors that influence consumers' readiness to purchase low-carbon products, including an understanding of carbon labeling, acceptance of these labels, dependability, consumer perspectives, confidence in the efficacy of adopting low-carbon consumption, societal pressures, influential social groups, costs, and economic incentives. Duan et al. (2023) identify that the positive effect on consumers' inclination to purchase carbon-labeled products can be attributed to functional, emotional, and epistemic values. Factors such as low-carbon product delivery speed, consumers' patience, and degree of pleasure also influence customers' willingness to purchase low-carbon products (Liu et al., 2017).

N. Xu and Y. Xu (2022) highlight the role of informal communication with family and friends as the most effective means for individuals to adopt new energy vehicles, underscoring the importance of tacit knowledge in spreading low-carbon intentions among automotive buyers. Price is a driving factor behind the purchase of carbon-labeled goods (Zhao et al., 2020), as consumers evaluate carbon labels to determine the extrinsic quality of a product, which significantly influences their attitudes and intentions to purchase (Khan & Lan, 2019). Liang et al. (2020) find that consumers with high subjective knowledge and perceived consumer effectiveness are more inclined to purchase packaged tea products with carbon labeling.

Despite consumers' positive attitudes toward environmental conservation, demand for organic products remains limited, primarily due to concerns about higher prices, entrenched food buying patterns, perceived limited accessibility, insufficient marketing and information, trust in labeling, and a sense of limited impact on consumer choices (Röös & Tjärnemo, 2011).

While products with carbon labels promote sustainable consumption and eco-friendly living, they also present challenges, including limited availability, complex cost estimation processes, low visibility of logos, and confusion about the labels' meaning (Bhardwaj, 2012). Surprisingly, consumer environmental information has no discernible impact on purchase intentions (Ahmad & Thyagaraj, 2015). According to Azizan and Suki (2013), the most significant indicators of customer

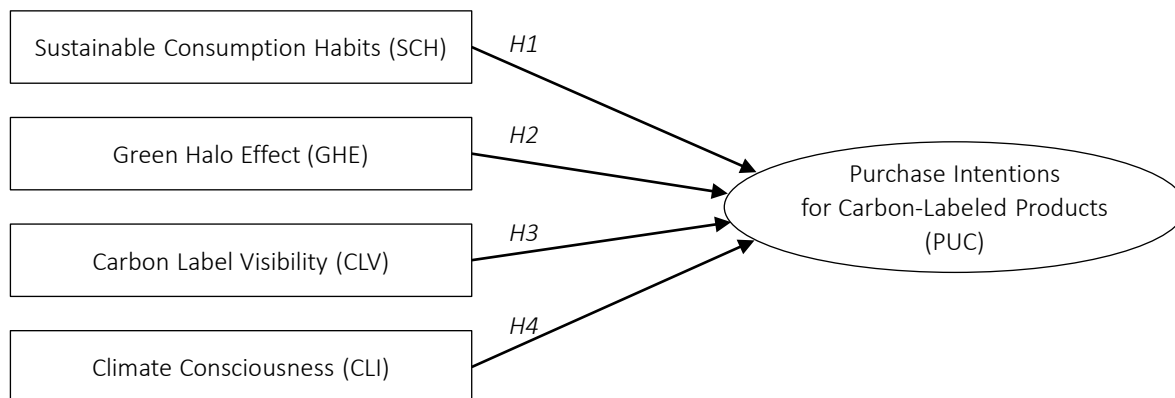


Figure 1. Theoretical framework

purchase intention are health consciousness and environmental awareness, with environmental labeling considered unimportant.

In conclusion, consumers’ inclination to purchase low-carbon products is influenced by a multitude of factors. These encompass understanding, endorsement, and reliability of carbon labeling, perspectives on low-carbon products, perceived effectiveness, adherence to social norms and reference groups, pricing considerations, and financial incentives. The readiness to make such purchases positively correlates with greater acceptance, credibility, and knowledge of carbon labels. However, this correlation may vary significantly depending on other factors (Li et al., 2017).

The impact of sustainable consumption habits, the green halo effect, carbon label visibility, and climate consciousness on the intention of consumers in Vietnam to purchase carbon-labeled products is eagerly anticipated to be investigated. With this in mind, the goal has been launched to better understand and encourage environmentally responsible consumer choices in Vietnam’s changing setting.

2. AIMS AND HYPOTHESES

This study seeks to bridge existing gaps in the literature by pursuing a key objective. This study aims to assess consumer awareness of carbon labels among the Vietnamese population and to analyze the various factors influencing consumer intentions to buy those products.

Figure 1 illustrates the conceptual foundation for this investigation. These theories are formulated in light of the goals of the present investigation as well as the literature review:

- H1: *Sustainable consumption habits impact purchase intentions for carbon-labeled products.*
- H2: *Green halo effect impacts purchase intentions for carbon-labeled products.*
- H3: *Carbon label visibility impacts purchase intentions for carbon-labeled products.*
- H4: *Climate consciousness impacts purchase intentions for carbon-labeled products.*

3. METHOD

The study was created using quantitative approaches, with the theoretical framework shown in Figure 1 as the basis for the study’s design. The independent variables encompass sustainable consumption habits, green halo effect, carbon label visibility, and climate consciousness, which are suggested to impact purchase intentions for carbon-labeled products. Before surveying student participants, ten educational experts crafted and reviewed a questionnaire. Utilizing Google Forms for survey administration due to its convenience and efficiency, noted in academic contexts (Masbullah & Bahri, 2022), Microsoft Excel was used for data encryption, while analysis employed SPSS and Amos software. In order to gauge the extent of agreement among participants regarding the statements, the evaluation employed a 5-tier

Likert scale. This scale spans from “strongly disagree” (1) to “strongly agree” (5), and it represents a foundational and widely adopted measurement instrument in research within educational and social sciences domains (Joshi et al., 2015). This tool not only facilitates uncomplicated data categorization and examination (Carifio & Perla, 2008) but also aligns seamlessly with the study’s principal goals of data collection. According to Table A1, the questionnaire had three sections. Part A gathered demographic information on people’s gender, ages, marital statuses, incomes, occupations, and awareness of items with carbon labeling. Part B concentrated on factors affecting consumers’ intentions to buy carbon-labeled goods, whereas Part C contained statements assessing the dependent variable – consumers’ intentions to buy carbon-labeled goods. Parts B and C required participants to respond using the 5-point Likert scale, which was proven effective for gauging opinions and attitudes (Awang et al., 2016) related to variables impacting intention to buy products with carbon labels.

It was necessary to choose a sample strategy to accurately reflect the population since it was too big to examine (Lee et al., 2010). A sampling solution should be used to manage a vast volume of data. Representative sample in quantitative research can be generalized to the target population (Omair, 2014). In Can Tho, Vietnam, information was gathered during the third quarter of 2023, and surveys were conducted. Due to its simplicity and ability to yet provide a solid foundation for data analysis, a straightforward random sampling approach is used in this study (Tang, 2019). A survey uses a random sampling method to provide a sample representative of the particular population being studied (Kato et al., 2020). The survey was collected from 250 university students in Can Tho City. After the negative vote was eliminated, 234 reliable samples remained for analysis.

In this study, a quantitative analysis was performed using SPSS 26.0 to compile data on product frequency and descriptive statistics. Additionally, the factors that significantly impact consumers’ intentions to buy products labeled with carbon information were explored. To guarantee the dependability of these variables, Cronbach’s Alpha was employed with a threshold set at 0.60. To en-

hance the efficiency of the analytical approach, exploratory factor analysis (EFA) was employed. EFA helped in summarizing variable observations and eliminating inappropriate factors. Confirmatory factor analysis (CFA) was performed using Amos 24 software. The aim of conducting a confirmatory factor analysis (CFA) was to evaluate the validity of the constructs, encompassing both their convergent and discriminant aspects. Convergent validity gauges the strength of associations, while discriminant validity emphasizes the absence of significant correlations among constructs. The results from the CFA allowed for establishing connections between the formulated hypotheses and the research findings. Drawing from the insights of Kline (2005), Byrne (2010), and Hair et al. (2014), structural equation modeling (SEM) was utilized for the implementation of the study. SEM was utilized to evaluate the hypotheses of the proposed structural model, assess the model’s fit, and determine the degree to which changes in the independent variable may be ascribed to variations in the dependent variable.

4. RESULTS

Table 1. Sample structure

Demographic	Characteristics (N = 234)	Frequency	Percent
Gender	Male	116	49.6
	Female	118	50.4
Age	Under 18	7	3.0
	18-25 years old	227	97.0
Academic Standard	University	234	100.0
Occupation	College student	234	100.0
Income	Under 5 million VND	200	85.5
	From 5 to 10 million VND	26	11.1
	From 10 to 15 million VND	2	0.9
	From 15-20 million VND	2	0.9
	Over 20 million VND	4	1.7
Marital status	Single	152	65.0
	In a relationship/dating	78	33.3
	Married	2	0.9
	Divorce	2	0.9

The study had 234 participants in total, as stated in Table 1. Regarding gender, 49.6% said they were male, while 50.4% said they were female.

Most participants were between 18 and 25 years old (97.0%), and only a small number (3%) were under 18. All respondents had at least a bachelor's degree, and most (100%) were college students. When it came to income, 85.5% said they made less than 5 million VND, 11.1% said they made between 5 and 10 million VND, and the rest of the percentages came from different income ranges, such as 0.9% for 10 to 15 million VND, 0.9% for 15 to 20 million VND, and 1.7% for over 20 million VND. 65.0% were unmarried, 33.3% were in a relationship or dating, 0.9% were married, and 0.9% were separated. In conclusion, the survey found that young, highly educated people made up the bulk of the respondents, which was precisely what the research was searching for.

The degree to which respondents were aware of carbon labels was investigated. Only 45.7% of the 234 survey participants claimed to have heard of carbon labels, compared to 54.3% who said they had never heard of them. This demonstrates how little knowledge there is of the carbon labeling system among Vietnamese citizens. In order to inform and communicate with the general public about the significance of carbon labeling for environmental reasons, additional effort must be made. This finding aligns with a prior investigation indicating that the general public's awareness of carbon labeling systems is comparatively limited (Duan et al., 2023).

Table 2. Cronbach's alpha analysis

Constructs	Code	Items	Cronbach's Alpha Value
Carbon label visibility	CLV	5	0.847
Green halo effect	GHE	5	0.823
Climate consciousness	CLI	5	0.813
Sustainable consumption habits	SCH	5	0.818
Purchase intentions	PUC	6	0.882

The validity of factors influencing students' decisions to buy items with carbon labeling may be assessed using Cronbach's Alpha coefficient test. As outlined by George and Mallery (2019), the modified overall correlation value must exceed 0.3 and the Cronbach's Alpha coefficient to be equal to or more than 0.60. All of the Cronbach's Alpha values in Table 2 are more than 0.8. Each correlation coefficient exhibits values equal to or exceeding 0.3, which shows that the variable meets the criteria. Suggestions for research are based on what is found to be reliable and will continue to be tested further.

Table 3. Exploratory factor analysis

Constructs	Number of Items	Factor Loadings
Carbon label visibility (CLV)	3	0.80 - 0.87
Green halo effect (GHE)	4	0.69 - 0.77
Climate consciousness (CLI)	3	0.68 - 0.85
Sustainable consumption habits (SCH)	4	0.67 - 0.79

The study employed exploratory factor analysis (EFA) to establish linkages among variables within the dataset and exclude those with relatively lower importance. KMO and Bartlett's analyses indicated that the Kaiser-Meyer-Olkin coefficient yielded a value of 0.871, surpassing the threshold of 0.5. This indicates a significant correlation between the observed variables and the underlying factor. Additionally, Bartlett's analysis has statistical significance (Sig = 0.000 < 0.05). As demonstrated in Table 3, factors with factor load coefficients larger than 0.5 are those of practical significance. The four components account for 68.17% of the data volatility of the 14 observed variables, as shown by the bigger than 1 Eigenvalue criteria and more than 50% cumulative deviation.

Table 4. Construct validity assessment

Constructs	Number of Items	CR	AVE	MSV
Carbon label visibility (CLV)	3	0.84	0.64	0.42
Green halo effect (GHE)	4	0.80	0.51	0.42
Climate consciousness (CLI)	3	0.82	0.60	0.30
Sustainable consumption habits (SCH)	3	0.77	0.52	0.41

Note: CR is a measure of Composite Reliability; AVE represents Average Variance Extracted; MSV stands for Maximum Shared Variance.

The composite reliability (CR) exceeding 0.7 for every aspect of the study's scale attests to the potential validity of this model. The average variance extracted (AVE) of the variables, which is more than the conventional AVE ratio of 0.5, reflects the model's convergence effect. Table 4 has removed SCH4 to improve the average variance extracted (AVE). Since maximum shared variance (MSV) is lower than average extracted variance (AVE), discriminability is guaranteed. Due to the four elements satisfying the requirements above, Table 4's difference values are deemed reasonable. The EFA analysis findings guarantee convergence and differential values based on the link between the observable variables. Observed variables differ from the observed variables of other factors while shar-

ing the exact characteristics of convergence on the same factor. In other words, when the matrix rotates, they converge on the same column.

Table 5. Fit indices for the CFA measurement model

Fit Index	Recorded Value	Desired Threshold	Outcome
Chi-square/df	1.852	≤2.00	Satisfactory
GFI	0.931	≥0.90	Satisfactory
CFI	0.96	≥0.90	Satisfactory
TLI	0.948	≥0.90	Satisfactory
RMSEA	0.06	≤0.08	Satisfactory
PCLOSE	0.159	≥0.05	Satisfactory

After using SPSS for exploratory factor analysis (EFA), Amos was employed for confirmatory factor analysis (CFA). A value exceeding 0.5 indicates a strong alignment between the normalized regression of the observed variables and the research model. All recorded observations possess a significance value of 0.000, leading to the retention of the variables. Table 5 shows that the measured numbers are good because they align with the criteria for a good fit. In particular, the Chi-square/df

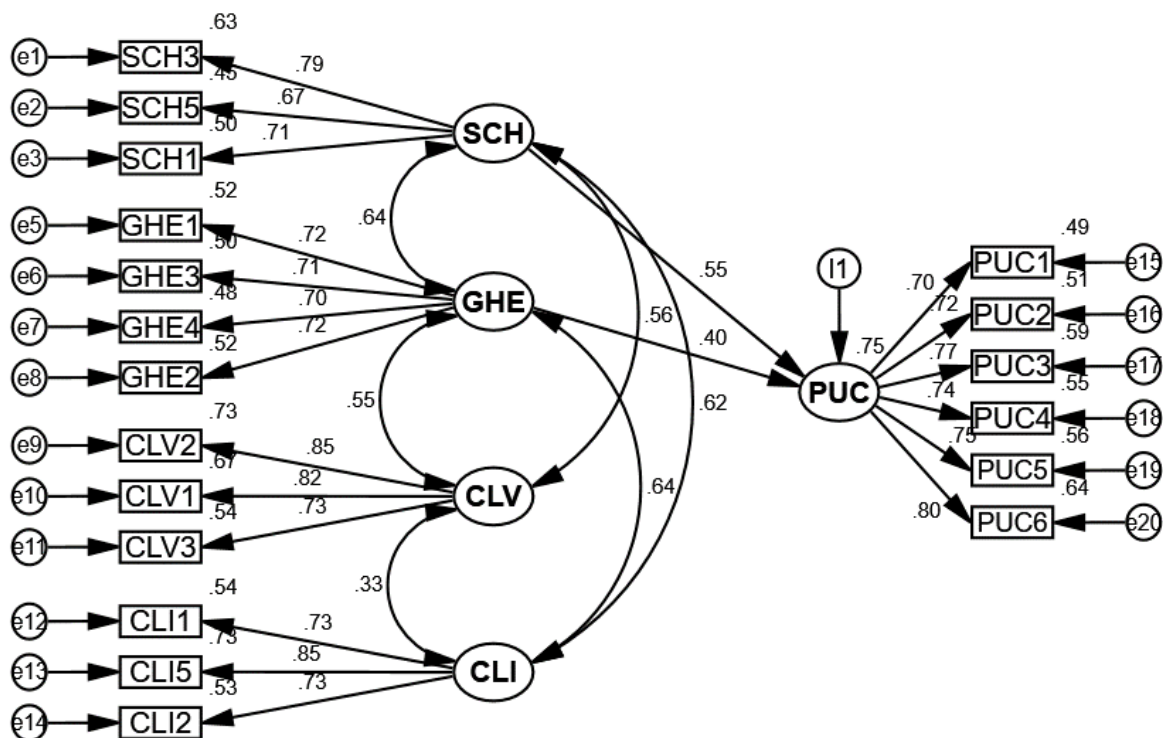
value of 1.852 is below the suggested threshold of 2.00, while the GFI, CFI, and TLI scores of 0.931, 0.96, and 0.948, respectively, surpass the specified threshold of 0.90, indicating a strong alignment. The strong correspondence is also demonstrated as the RMSEA value of 0.06 falls within the established threshold of 0.08. Lastly, the PCLOSE value of 0.159 surpasses the 0.05 standard, indicating a satisfactory level of fit. This is a condition for continuing to analyze the SEM model.

Table 6. Model’s findings

Hypotheses	Explanatory Variables	P-Value
H1	Sustainable consumption habits impact purchase intentions for carbon-labeled products.	0.000
H2	Green halo effect impacts purchase intentions for carbon-labeled products.	0.000

Note: The p-value is less than 0.001. Significant at the 0.05 threshold.

The link between independent and dependent variables is examined using the SEM model. Table 6 and Figure 2 display the fundamental indica-



Note: CMIN/DF = 1.844, GFI = 0.892, CFI = 0.944, TLI = 0.934 and RMSEA = 0.060. *** p < 0.001. SCH means sustainable consumption habits; GHE means green halo effect; CLV means carbon label visibility; CLI means climate consciousness.

Figure 2. Direct and indirect impacts on the intention to buy items with carbon labeling

tions. The value of Chi-square/df is 1.844, smaller than the good is 2. When the value of the goodness of fit index (GFI) attains 0.892, it is deemed to have a sufficient degree of suitability (Baumgartner & Homburg, 1996; Doll et al., 1994). The comparative fit index (CFI) surpasses the threshold of 0.9 with a value of 0.944, which is a respectable result. The outcome revealed a root mean square error of approximation (RMSEA) measuring 0.06, which falls below the necessary threshold of 0.08, and the Tucker-Lewis index (TLI) exceeds the acceptable threshold of 0.9, with a value of 0.934. Two independent variables, green halo effect and sustainable consumption habits, had Sig values lower than 0.05 after the data were run. This outcome illustrates the significant influence of two distinct variables on the dependent variable, purchase intention regarding products with carbon labels. The statistical analysis indicates that carbon label visibility and climate consciousness exhibit p-values exceeding 0.05. This suggests that their impact on the dependent variable is not statistically significant. The impact arrow of carbon label visibility and climate consciousness to products with carbon labels has been removed. Additionally, purchasing intentions for items with carbon labels are affected by sustainable consumption habits by 0.552 units. It demonstrates how increasing someone's sustainable consumption habits to one unit will inspire purchase intentions for items with carbon labels to increase by 0.552 units, significantly impacting the promotion of such intents.

Moreover, increasing a person's green halo effect by one unit would also increase purchase intentions for carbon-labeled products by 0.399 units. Considering the analysis results, the mean R-value for the products with carbon labels-dependent factor is 0.746. This means that the consumption habits and green halo effect components explained the 74.6% impact of these two variables on purchase intention regarding products with carbon labels. Ultimately, H1 and H2 were accepted through analysis, and H3 and H4 were rejected.

5. DISCUSSION

The search for sustainable consumption practices is an urgent issue today due to escalating environmental challenges. As a type of eco-labeling, carbon labeling informs customers of the carbon

emissions connected to items throughout their lifespan. Promoting a culture of sustainable consumerism depends on knowing the elements that affect customers' decision to buy items with carbon labels. As per the findings from this investigation, sustainable consumption habits and the green halo effect affect consumers' intentions to buy products with carbon labels. The two factors, carbon label visibility and climate consciousness, were found to have no effect on intentions to buy products with carbon labeling.

Significant insights were gained from the investigation of the connection between sustainable consumption practices and purchase intention regarding products with carbon labels. The results of this study demonstrate that sustainable consumption habits exert a notable influence on consumers' intentions to purchase carbon-labeled products. Khalifa and Liu (2007) also found that online shopping habits similarly impact repurchase intention. This finding contrasts with that of Chiu et al. (2010), who determined that an increased routine level diminishes trust's impact on the intention to make repeat purchases. This finding is consistent with the viewpoint that individual behaviors and choices regarding one's lifestyle exert a substantial influence on consumer tendencies toward adopting sustainable consumption practices. Acceptance of H1 highlights the importance of established eco-friendly habits in directing consumers toward carbon-labeled products. By continuously engaging in sustainability practices, consumers seek products that match their values, further reinforcing their intention to purchase carbon-labeled products.

The study outcomes validate H2, which proposed that the noteworthy influence of the green halo effect plays a crucial role in shaping customers' inclination to purchase products featuring carbon labels. The findings of this study are consistent with those of earlier ones. The halo effect resulting from organic labels has been observed to have a favorable effect on the variables influencing consumer purchasing patterns, as demonstrated by Kapoor et al. (2022). The inferences about quality traits and utilitarian value sparked by the labeling cause this effect, which increases the likelihood of product purchase and willingness to spend a higher amount on the item. Additionally, Gong

et al. (2015) discovered that the halo effect might raise customers' opinions of how valuable mobile payments are, raising their intentions to use them. This study showed this impact, where customers tended to rank items with the carbon label more highly owing to their eco-friendly qualities. This study advances the understanding of this topic by establishing a link between the green halo effect and purchase intentions for goods with carbon labels. The findings offer helpful information for companies and marketers advertising environmentally friendly and sustainable products.

The study's findings demonstrate that H3, which proposed that purchase intentions for products with carbon labels are unaffected by carbon label visibility, cannot be accepted. Babakhani et al. (2020) contend that the advantages of carbon labeling receive little attention, indicating that they are insufficient to persuade customers to purchase menu items with reduced emissions. This conclusion, however, contrasts with Ul Haq et al. (2019), who contend that brand label has a favorable and substantial influence on customers' intentions to purchase cosmetics in Pakistan's cosmetics industry. Another point is that, in this study, carbon label visibility indirectly impacted consumers' intentions to purchase items with carbon labels. However, climate consciousness also had an impact on the other variables. The presence of visible carbon labels could impact consumers' perception of a product's environmental attributes. This, in

turn, might foster a more favorable inclination toward purchasing such items.

The study's analysis of climate consciousness has produced a finding that contradicts H4. Research results indicate that climate consciousness does not influence consumers' purchase intention regarding products with carbon labels, as demonstrated by previous studies. This result calls for a careful investigation of the complex aspects that underpin customers' intentions to buy items with carbon labels in connection to their concern for the environment. This finding contradicts Okada et al.'s (2019) finding that the level of environmental consciousness directly impacts the purchase intention of individuals who do not use electric vehicles. The findings concurred with Kim and Lee (2023), who found that environmental concerns did not influence consumers' intentions to buy eco-friendly goods. However, the fact that there was no direct effect on products with carbon labels in this study does not lessen the significance of raising consumer awareness of climate change to encourage sustainable purchasing habits.

The relationship between sustainable consumption patterns, the green halo effect, and purchase intentions for carbon-labeled goods is essential to understand in light of this research finding. Although carbon label visibility and climate consciousness do not directly affect the other elements, they significantly impact the remaining variables.

CONCLUSION

This study sought to determine factors of consumer preferences for carbon-labeled products. Although the group of participants is relatively limited, it mainly consists of high-performing students, providing appropriate information to consumers planning to buy carbon-labeled products.

This result highlights a fundamental problem: the general perception of Vietnamese consumers about carbon labeling is lacking. This lack emphasizes the need for effective communication strategies to raise environmental awareness. Notably, the findings reveal that consumers' intentions to purchase carbon-labeled products are significantly influenced by two key factors: sustainable consumption habits and the green halo effect. These elements act as critical drivers, guiding consumer choices and behaviors.

Furthermore, though not direct determinants of purchase decisions, ancillary factors closely related to sustainable consumption and the green halo effect bolster purchase intentions. These insights serve as a compass for guiding marketing strategies, informing governmental initiatives, and shaping educational programs to promote sustainable consumption practices and steer Vietnam toward a greener and more environmentally conscious future.

Although the results have met the research objectives, some limitations remain. The SEM model's goodness of fit index (GFI) fell short of the required level of 0.9, raising the possibility that the sample size used had limitations. Recognizing these limitations, it is essential to underscore the study's significance while also recognizing its constraints. The significantly small sample size is the first constraint, mainly university students, most of whom are surveyed students living in the Can Tho city area. As a result, the study's generalizability may be compromised by the restricted coverage of varied populations. The second drawback is the overwhelming presence of student participants, which may lead to a bias against particular age groups and educational levels.

Based on the study's findings, there are a number of recommendations for companies and businesses. To raise Vietnamese people's awareness of carbon labeling, the government should implement cognitive behavior educational measures while supporting the purchase of low-carbon products. The sustainable consumption habits factor influences purchase intentions for carbon-labeled products. Governments should implement policy interventions encouraging sustainable choices, such as reducing taxes on environmentally friendly products, regulating disposable plastics, and introducing carbon prices to curb emissions. In addition, governments should create programs that reward sustainable behavior, such as offering discounts for public transportation, energy-efficient appliances, and eco-friendly products. Companies should have take-back programs to offer take-back or recycling programs for products they sell. This encourages responsible disposal and shows their commitment to the product's lifecycle.

Users view the green halo effect as influencing intentions to buy products with carbon labels, and the green halo effect can be increased if the government can demonstrate a substantial commitment to sustainable practices within government operations. Eco-friendly policies, energy-efficient buildings, and waste reduction initiatives set a positive example for citizens. The government may establish certification programs for those that meet specific sustainability criteria. These certifications can boost the green halo effect by signaling to consumers that they prioritize environmental responsibility.

AUTHOR CONTRIBUTIONS

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APPENDIX A

Table A1. Questionnaire items

Variables	Code	Statements	1*	2*	3*	4*	5*
Sustainable Consumption Habits	SCH1	I prefer to buy products with minimal packaging or products made from recyclable materials.					
	SCH2	I try to reduce my overall consumption and choose more sustainable alternatives.					
	SCH3	I am actively looking for products with environmentally friendly or sustainable labels when shopping.					
	SCH4	I regularly review the environmental impact of product packaging before buying.					
	SCH5	I regularly study product environmental declarations and certifications before buying.					
Green Halo Effect	GHE1	I believe that the products that are labeled are environmentally friendly because their carbon reduction efforts have a positive impact on the environment.					
	GHE2	I have noticed that products with environmentally friendly attributes are of higher quality.					
	GHE3	I am willing to buy carbon-labeled products because of their association with environmentally friendly properties.					
	GHE4	I believe that buying carbon-labeled products can positively impact reducing carbon emissions.					
	GHE5	I tend to feel that carbon-labeled products are more environmentally friendly, even if I do not fully understand what carbon labeling means.					
Carbon Label Visibility	CLV1	I can recognize the carbon labels on the product during the shopping process.					
	CLV2	I am attracted to the carbon labels that are highlighted on the products.					
	CLV3	I am more attracted to carbon-labeled products that I can see.					
	CLV4	I like products with clear and attractive carbon labels because they attract my attention.					
	CLV5	I felt the presence of carbon labels on products motivated me to make environmentally friendly choices.					
Climate Consciousness	CLI1	I believe that climate change is a major global issue.					
	CLI2	I am aware of the environmental impact of carbon emissions and greenhouse gases.					
	CLI3	I actively search for information about the environmental activities of companies before making purchases.					
	CLI4	I feel motivated to support companies that make a positive contribution to environmental sustainability.					
	CLI5	I believe that climate change will have a significant impact on future generations.					
Purchase Intentions for Carbon-Labeled Products	PUC1	I will buy carbon-labeled products even if they are a little more expensive than unlabeled alternatives.					
	PUC2	I will buy carbon-labeled products in my future purchasing decisions.					
	PUC3	I would prefer carbon-labeled products to unlabeled ones.					
	PUC4	I feel proud and satisfied with my purchase when I choose carbon-labeled products.					
	PUC5	I actively search for carbon-labeled products when making a purchase decision.					
	PUC6	I will recommend that someone else buy carbon-labeled products.					

Note: *1: Strongly Disagree; *2: Disagree; *3: Neutral; *4: Agree; *5: Strongly Agree.