

Article

How Do Environmental Knowledge, Eco-Label Knowledge, and Green Trust Impact Consumers' Pro-Environmental Behaviour for Energy-Efficient Household Appliances?

Imran Hossain ¹ , Md. Nekmahmud ^{2,*}  and Maria Fekete-Farkas ³ 

¹ Department of Marketing, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj 8100, Bangladesh; imran@bsmrstu.edu.bd

² Doctoral School of Economic and Regional Sciences, Hungarian University of Agriculture and Life Sciences (MATE), 2100 Gödöllő, Hungary

³ Institute of Agricultural and Food Economics, Hungarian University of Agriculture and Life Sciences (MATE), 2100 Gödöllő, Hungary; farkasne.fekete.maria@uni-mate.hu

* Correspondence: nekmahmud.mohamed@phd.uni-mate.hu or nekmahmud.argon@gmail.com

Abstract: Pro-environmental behaviour (PEB) helps individuals to minimize the negative effects of their actions on the environment; for example, by recycling and reducing energy consumption. This study aimed to explore consumers' attitudes and trust in energy-efficient household appliances and their environmental and eco-label knowledge to determine how these may affect pro-environmental behaviour (PEB). In addition, the study examined the mediating effects of attitude and green trust on the proposed frameworks of environmental and eco-label knowledge in relation to consumer pro-environmental behaviour. PLS-SEM (Partial Least Squares–Structural Equation Modelling) was applied to a study from Bangladesh to examine hypotheses proposed from the data generated by 1510 valid respondents relating to their experiences of using household energy-efficient products. The results showed that environmental knowledge, eco-label knowledge, attitude, and green trust all significantly correlated with consumer pro-environmental behaviour. In addition, attitude and green trust significantly mediated the relationship between environmental knowledge, eco-label knowledge, and pro-environmental behaviour. This study also found that green trust positively affects consumer attitudes, and that those attitudes serve as a significant mediator between green trust and pro-environmental behaviour. An IPMA (importance-performance matrix analysis) map indicated that the total effects of environmental attitude and eco-label knowledge were more important to defining the pro-environmental behaviour of consumers than those of environmental knowledge and green trust. To the best of the authors' knowledge, this research introduces for the first time an empirical survey that provides a new theoretical framework for consumer pro-environmental behaviour in regard to energy-efficient household appliances in the context of a developing country. Suggestions are provided on ways to promote energy-saving appliances from theoretical and practical perspectives.

Keywords: environmental marketing; pro-environmental behaviour; energy-efficient products; green trust; eco-label knowledge; environmental knowledge; sustainable energy consumption



Citation: Hossain, I.; Nekmahmud, M.; Fekete-Farkas, M. How Do Environmental Knowledge, Eco-Label Knowledge, and Green Trust Impact Consumers' Pro-Environmental Behaviour for Energy-Efficient Household Appliances? *Sustainability* **2022**, *14*, 6513. <https://doi.org/10.3390/su14116513>

Academic Editors: Diana Rusu and Sorin Popescu

Received: 12 April 2022

Accepted: 13 May 2022

Published: 26 May 2022

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

Global climate change has been an emerging issue of concern in recent decades, and it is clear that consumer environmental behaviour can contribute to reducing CO₂ emissions and protecting the environment. According to the Intergovernmental Panel on Climate Change (IPCC), the current global warming results from human activities, mainly from consumption patterns [1]. As a result, policymakers around the world have highlighted the need for citizens to take responsibility for their local ecology. These human responsibilities include recycling, using energy-efficient items, purchasing green

label products, and lowering electricity use [2,3]. In addition, the IPCC (2016) reported that changes in consumption patterns, adoption of energy-saving measures, psychosocial interventions, and reduction in food waste could all help reduce global energy consumption and emissions. Nevertheless, intense global dependence on energy increases the likelihood of environmental degradation over time [4]. Dealing with ecological degradation requires a change in consumer behaviour based on a better understanding of the factors influencing an individual's response to environmental consumption behaviour [1].

The use of household energy is an important factor for sustainable economic growth [5]. Increasingly, household appliances are the major source of household energy consumption and CO₂ emissions, and this is growing rapidly. According to the International Energy Agency IEA, (2019), the residential sector consumed approximately 21% of total global energy consumption in 2017. Therefore, the usage of energy-efficient products can greatly reduce household energy consumption, carbon emissions, and environmental sustainability [6]. In addition, the engagement of consumers in pro-environmental behaviour (PEB) reduces the negative impact of their actions on the environment [7].

While pro-environmental consumer behaviour has been investigated in developed markets, such research is still in its infancy in many emerging markets, including in Asia. For example, since Bangladesh is one of the fastest growing developing countries, its energy consumption has increased rapidly. Meanwhile, Bangladesh, a vulnerable country in terms of climate change, has taken steps to minimize greenhouse gas emissions. The country faces hurdles in maintaining economic development after assuring commercial and residential energy for its people, which are predominantly reliant on fossil fuels [5]. Bangladesh contributes very little to greenhouse gas emissions globally. Renewable energy is essential for both a sustainable future and modern technology [8]. The energy sectors in Bangladesh are faced with several challenges, such as extreme system losses and a lack of infrastructure to enable the fast installation of new power plants. This causes a big gap between energy supply and energy demand. Therefore, adopting consumer pro-environmental behaviour using energy-efficient products is mandatory to solve the problems. It is well-known that Bangladesh has managed its energy sector very poorly [9]. Since energy is generally considered the key to economic growth, the country must overcome the obstacles caused by this issue if it wishes to ensure sustainable economic growth [5]. Thus, Bangladesh was selected for this study due to various reasons.

Researchers have previously used the theory of planned behaviour (TPB) to examine consumers' intention to purchase energy-efficient appliances; this considers factors such as ethical norms [10], price [11,12], environmental concerns, and environmental knowledge [2,4,10]. However, environmental knowledge also has significant influence on the willingness of consumers to purchase energy-saving products. Therefore, improving environmental knowledge by increasing public awareness and offering environmental education is a feasible and easy approach [13]. One of the major tools in this approach is the use of eco-labels to direct and inform consumers about product energy efficiency [14]. Eco-labels provide specific environmental information to consumers at the point of purchase to help them make environmentally responsible purchases [15]. In addition, eco-labels reduce consumers' information search costs and effort, as well as encourage recycling. Moreover, green trust is the primary driver for the purchase of energy-efficient products. Consumers' pro-environmental behaviour can be increased based on improving their environmental and eco-label knowledge and green trust in particular products. Therefore, previous studies have not provided sufficient knowledge on these variables to understand pro-environmental consumer behaviour, and the analysis of the subject in developing countries such as Bangladesh is still missing. Therefore, this paper attempts to fill the gap in the green consumer behaviour literature through exploring a fresh look at the role of environmental and eco-label knowledge in the attitude-behaviour relationships of consumers' pro-environmental behaviour.

The main objective of this study is to integrate consumers' attitudes and trust in energy-efficient products with their environmental knowledge and eco-labels to determine

how these affect pro-environmental consumer behaviour. It examines the mediating effects of attitude and green trust on the proposed pro-environmental behaviour framework. The novel contribution of this study is examining the pro-environmental consumer behaviour of energy-efficient products by integrating consumers' environmental knowledge, eco-label knowledge, attitude, and trust in the model. In addition, this research will answer the following questions: How does environmental knowledge, eco-label knowledge, and green trust impact consumers' pro-environmental behaviour in the TPB model for energy-efficient household appliances? Which environmental factors (environmental knowledge, eco-label knowledge, and green trust) have the comparatively greatest influence on pro-environmental consumer behaviour in the context of developing countries based on IPMA (importance-performance matrix analysis)? To the best of the authors' knowledge, the current study is the first empirical survey that widely provides a new theoretical framework regarding consumers' pro-environmental behaviour in energy-efficient household appliances in Bangladesh. This paper contributes to the methodology by using the PLS-SEM (Partial Least Squares–Structural Equation Modelling) to examine the relationship between variables and using trust as a mediator to help in the formation of effective related policies at both the government and corporate levels.

This research is structured as follows: Section 2 initially discusses the literature with a theoretical background and the proposed conceptual framework. Secondly, Section 3 describes the methodology, data processing, and path modelling. Section 4 explains the results of hypothesis testing, mediating testing with a model fit, and discussion. Finally, the discussion, conclusions, recommendations, limitations, and future research on consumer energy-efficient purchase intention and pro-environmental behaviour are presented in Section 5.

2. Literature Review

2.1. Theoretical Framework

Previously, several studies measured environmental behaviour based on the Theory of Reasoned Action (TRA) [16] and the Theory of Planned Behaviour (TPB) [17]. Most of the studies focused on consumer purchase intention and behaviour with existing variables of TPB such as attitude, subjective norms, and perceived behaviour control. Many authors have also used the TPB framework alternative to pro-environmental behaviours (e.g., [18,19]). To better explain the attitude–behaviour gap, researchers have included alternative psychographic factors in pro-environmental behaviour models [18,19]. In general, TRA and TPB proposed that behaviour results from intention, which is ultimately determined by attitude and subjective norms. Nonetheless, some studies claim that the relationship between intentions and behaviours may be weaker than the models implied [20]. To support this claim, scholars recommend including self-reported actual behaviour in the models because the real interest is behaviour, not the intention [21,22]. In addition a study takes a new look at the attitude–behaviour relationship to predict consumers' ecologically conscious behaviour by including general environmental knowledge and knowledge of eco-labels into the TRA model [23]. Consequently, consumers' knowledge and trust in eco-labels with their environmental knowledge to determine the effect of pro-environmental consumer behaviour [24]. Based on their theoretical background and TRA, we focus on measuring pro-environmental consumer behaviour. Earlier, some studies only focused on consumer environmental knowledge and attitude in the TPB model [2,4,10]. They ignored consumers' green trust and knowledge of eco-labels, which are the key factors in measuring consumers' pro-environmental behaviour. Based on the TPB, this current study focused on environmental knowledge, eco-label knowledge, green trust and attitude in the proposed model to understand the reality of consumer pro-environmental behaviour.

2.2. Environmental Knowledge

Environmental knowledge is defined as the understanding of environmental concepts, challenges, and action plans that can be applied to solve environmental issues [25]. Attitude

is considered to be influenced by knowledge. Greater knowledge is associated with a higher influence of attitudes on behaviour [26]. Similarly, greater environmental knowledge improves consumer attitudes and purchase behaviour [19,24]. Nevertheless, scholars [7] argued that environmental knowledge is not required to engage in pro-environmental behaviour. Only a small portion of pro-environmental behaviour is directly triggered by environmental knowledge, which supports the knowledge–attitude–behaviour model [27]. Environmental attitude acts as a mediated variable on pro-environmental behaviour [24,28]. However, consumers pay attention to selecting particular products and react based on their learned knowledge. Consumers' level of environmental knowledge has influenced their attitudes to purchase green products [23–25,29–31]. Similarly, some studies proved that environmental knowledge drives the promotion of energy-efficient behaviour [2,6]. Recent studies [4,32] found that environmental knowledge positively affects people's intention to purchase electric vehicles. Thus, we propose the following hypotheses:

Hypothesis 1 (H1). *Environmental knowledge has a positive and significant relationship to attitudes towards the environment.*

Hypothesis 2 (H2). *Environmental knowledge is positively related to consumer green trust.*

Hypothesis 3 (H3). *Environmental knowledge is positively related to consumer pro-environmental behaviour.*

2.3. Eco-Label Knowledge

Eco-labelling is a new concept in environmental marketing that allows consumers to learn more about green products [33]. An eco-label is an important source of consumer trust since it informs consumers about green products that are less harmful to the environment and health [15,34]. Prior research has demonstrated that general environmental knowledge is inadequate for predicting and assessing pro-environmental consumer behaviour [15,17,19]. Therefore, it is argued that particular knowledge is required to encourage consumers to engage in pro-environmental behaviour. Because customers' attitudes on environmental issues are unstable (e.g., [15]), consumers should thus know about the eco-labels of products because they provide correct information about the function of particular environmentally friendly products, motivate consumers to make a purchasing decision, and raise environmental consciousness [19,23]. Eco-labelling is one of the newest marketing research topics in green products, where studies have found that engagement with eco-labels has a positive correlation with consumer environmental attitudes [23,24,33]. The majority of previous research has found a link between environmental knowledge and attitude behaviour [34]. For example, eco-label knowledge is applied in pro-environmental behaviour models in green markets where observed eco-label knowledge has a positive relationship with environmental attitude and pro-environmental behaviours [23,24,33]. Similarly, consumers' eco-labels knowledge positively affected trust for energy-efficient home appliances [32]. Therefore, knowledge of eco-labels develop consumer trust in energy-efficient home appliances, and it has a positive influence on environmental attitude, trust, and pro-environmental behaviour [24]. As a result, this study integrated both general environmental and eco-label knowledge to establish how these two factors shape environmental attitudes and indirectly influence behaviour. Thus, we propose the following hypotheses:

Hypothesis 4 (H4). *Eco-label knowledge has a positive relationship to attitudes towards the environment.*

Hypothesis 5 (H5). *Eco-label knowledge has a positive and significant effect on green trust.*

Hypothesis 6 (H6). *Eco-label knowledge has a positive and significant effect on consumer pro-environmental behaviour.*

2.4. Attitudes

In the TPB model, the most influential predictor is attitude, which refers to one's favourable or unfavourable assessment of a specific behaviour [35]. Consumer behaviour is influenced by attitudes that help to predict future behaviour [24]. An individual who has a favourable attitude toward action is more likely to perform it [10]. For example, if a consumer has a favourable attitude toward environmental issues, they may wish to buy more expensive energy-efficient products rather than less expensive traditional products [10]. Previous research found that attitude significantly influences pro-environmental behaviour [24,36]. Earlier studies proved that attitude has a significant positive relationship with purchase intention for organic food [37,38], green products [38,39], recyclable products [40,41], etc. Similarly, prior literature proved that consumer attitude influences the intention to purchase energy-efficient products and mediates behavioural intention [10,33,42,43]. Environmental knowledge influences environmental attitudes, which in turn affects pro-environmental behaviour. For this reason, scholars consider attitude as an important construct and have proposed the knowledge–attitude–behaviour model [24,44]. Nevertheless, consumer environmental attitude positively leads to behavioural intention and environmentally conscious regarding energy-efficient appliances [1,24]. Thus, we draw the following hypothesis:

Hypothesis 7 (H7). *Attitude has a positive and significant effect on consumer pro-environmental behaviour.*

2.5. Green Trust

Green trust or energy-saving trust is the basic component that may influence long-time consumers' purchase intention, behaviour, and consumption [41]. Green trust refers to consumer ability or vulnerability to rely on accepting particular objectives based on the environmental performance, reliability and previous environmental functionality [42]. Green trust significantly motivates consumers' purchasing attitudes and intention towards environmentally friendly products and ultimately helps to drive actual behaviours [45–48]. Previous studies [46,49,50] identified that green trust works as the most important key factor for influencing consumers to buy green products. Earlier studies proved that green trust has positively influenced the purchase of green products such as e-service quality [43], organic food [44], coffee industry [45], and energy savers [46]. A recent study [43] stated that green trust has a significant positive relationship with the purchase experience of electronics products in Taiwan. Thus, green trust is working as the key construct in the context of developing countries. Therefore, we propose the following hypotheses:

Hypothesis 8 (H8). *Green trust has a positive and significant effect on consumer pro-environmental behaviour.*

Hypothesis 9 (H9). *Green trust has a positive and significant effect on consumer attitude.*

2.6. Mediation Effects as Consumer Attitude

Pieces of evidence from previous research have confirmed that attitude and green trust have mediating roles on the purchase intention of energy-efficient appliances. In the TPB model, an attitude has a significant and positive influence on purchase intention, and it can be one of the triggers of green behaviour. Knowledge about any object improves one's attitude towards it, and as knowledge influences the purchase decisions and behaviours of consumers, it can indirectly influence certain behaviour through attitude mediation [24]. Similarly, consumers' knowledge of eco-labels may indirectly impact their behaviour since it is more likely to result in positive attitudes towards products, leading to positive pro-

environmental behaviour. Knowledge and behaviour can be linked through attitudes as proposed by the knowledge–attitude–behaviour model [34]. Thus, we propose the mediating hypothesis:

Hypothesis 10a (H10a). *The relationship between general knowledge and PEB is mediated by consumer attitudes towards the environment.*

Hypothesis 10b (H10b). *The relationship between eco-label knowledge and PEB is mediated by consumer attitudes towards the environment.*

Hypothesis 10c (H10c). *The relationship between green trust and PEB is mediated by consumer attitudes towards the environment.*

2.7. Mediation Effects as Green Trust

Trust is an essential influential driver in deciding on purchasing any product [47]. Even it emphasized that trust can enhance customer loyalty and facilitate value creation [48]. Green trust significantly motivates consumer purchase intention towards green products and ultimately drives actual behaviours [41,49]. Acquiring product knowledge can increase trust, ultimately influencing consumer purchase behaviour [50]. Knowledge of eco-labels has been positively associated with pro-environmental behaviour. According to [51], eco-label knowledge alone is not enough to influence consumers' purchasing decisions. Consumers must have confidence that such information is credible [52–56]. Thus, eco-label knowledge might indirectly impact on consumers' behaviour through mediated eco-label trust [24]. Consequently, green trust is acting as the mediating role between environmental and eco-label knowledge and pro-environmental behaviour. Therefore, we propose the following hypotheses:

Hypothesis 10d (H10d). *The relationship between environmental knowledge and PEB is mediated by consumer green trust.*

Hypothesis 10e (H10e). *The relationship between eco-label knowledge and PEB is mediated by consumer green trust.*

Based on the abovementioned literature and theoretical background, a hypothesized conceptual model of consumers' pro-environmental behaviour is proposed (Figure 1).

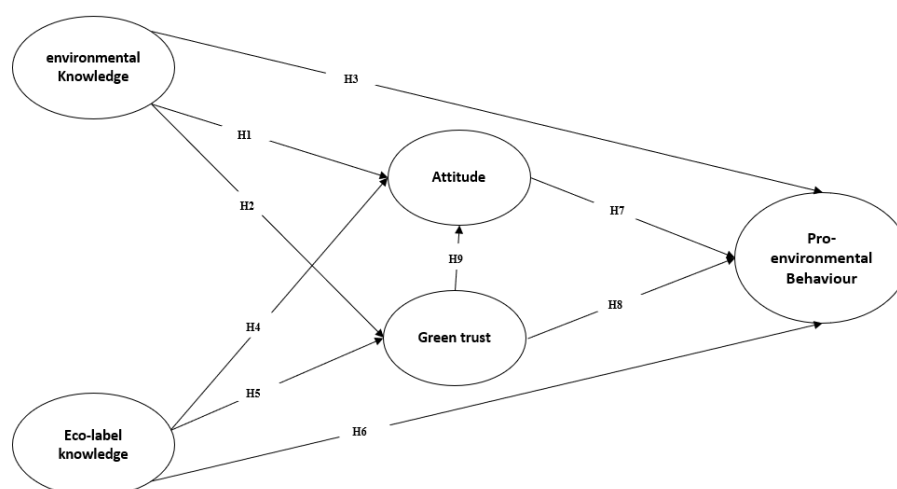


Figure 1. Proposed conceptual model of consumers' pro-environmental behaviour.

3. Methods

3.1. Instrument Development

The research used a survey questionnaire with constructs and items derived from previous related studies as part of a quantitative research design. The questionnaire has demographic characteristics, general questions about energy-efficient products, and measurement items. Three items of environmental knowledge were adapted from previous sources [57–59], three items of eco-label knowledge were taken from [54], four items of attitude were used from [10,60], three items of green trust were adapted from studies [57,61,62], and finally, seven items of pro-environmental behaviour were adapted from previous studies [1,57,63–65]. Five-point Likert scales were used to rate the question statements with 1 stating strongly disagree and 5 referring to strongly agree. Table A1 (see Appendix A) describes the details of all constructs and their items with literature sources.

Before administering the survey, we conducted a pilot test of the data collection instrument to confirm its validity and reliability. During the pilot testing, we used the convenience sample technique to collect 60 complete questionnaires from residents at Uttara city, Dhaka, in order to calculate the Cronbach's alpha for the constructs. In addition, we interviewed four experts (i.e., two are university professors and two are industry experts who are working on energy-efficient products), asking them to review and comment on the questionnaire. Based on feedback from interviewers and pilot data tests, we removed two items from green trust, one item from attitude, and eco-label knowledge. The questionnaire was originally prepared in English and translated into Bangla language by the authors. The final measurement questionnaire contains sufficient items to assess the model and perform the partial least squares–structural equation modelling (PLS-SEM) for data analysis [58].

3.2. Data Collection Procedure

Our structured survey questionnaire was used to collect data from targeted respondents. This study considers Bangladeshi consumers who have experience purchasing energy-efficient household appliances such as LED bulbs/lights, energy-saving refrigerators, air conditioners, T.V., solar energy panels, energy savings space and water heaters, cooking appliances such as micro-ovens, high-efficiency laundry machines, and so on. At the beginning of the questionnaire, respondents were asked whether she/he has ever bought energy-efficient household appliances or not (Yes/No). If yes, then S/he can proceed to the next section. Following the responses' selection criteria, the data were collected through (1) direct person-to-person contact and (2) social media platforms. Final-year Bachelor's and MBA students were selected as data collectors. We made four groups, and each group had five interviewers. Every member received instruction on how to approach the responses. For data collection, each group was processed in 25 electronic shops in 3 different states of Bangladesh. A simple random sampling technique was applied to collect the data from electronic shops. We distribute our questionnaire to those customers who visit electronic shops to purchase electronic products. On the other side, due to the COVID-19 epidemic, a Google Docs-based questionnaire was created to gather data from direct person-to-person communication through the Facebook platform. As a convenience sample technique, the authors applied unrestricted self-selected surveys by posting a Facebook status, and furthermore, they inboxed the questionnaire to their Facebook friends who live in Bangladesh. In addition to requesting a valid response on the social media timeline, we sent the questionnaire to those well-known respondents. In addition, to ensure geographic coverage of the population, the questionnaire is posted in some popular Facebook groups where people find out about electronic products via local stores that sell them. Finally, after collecting responses for three months (August to October 2021) using online and face-to-face surveys, we have received responses from 1600 respondents. However, ultimately, we identified 1510 questionnaires as valid. Another 90 questionnaires were found not correctly answered. In some cases, respondents answered all moderate responses without thinking about reality. Table 1 demonstrates the socio-demographic profile of the participants.

Table 1. The socio-demographic profile of respondents.

	Variables	Frequency	Percent
Gender	Male	950	63
	Female	560	37
Age	21–30 years	280	19
	31–40 years	268	17
	41–50 years	482	32
	51–60 years	240	15
	61–70 years	200	14
	Above 70 years	40	3
	Secondary	250	17
Level of Education	Higher secondary	380	25
	Undergraduate	510	34
	Master/Postgraduate	370	24
Family Size	2–3	160	11
	4–5	540	36
	6–7	612	40
	More than 7	198	13
	USD 120–240	440	29
Income (monthly)	USD 241–360	468	31
	USD 361–480	256	17
	USD 481–600	148	10
	USD 601–720	84	5
	Above USD 720	1144	8
	Farmer	452	30
Profession	Government job	268	18
	Private job	180	12
	Entrepreneur	380	25
	Others	230	15
N =		1510	

3.3. Data Analysis Approach

The structural Equation Model (SEM) is a popular approach for estimating causal models used to examine relationships between latent constructs. In this research, PLS-SEM (partial least square-SEM) was applied for data analysis to measure the key constructs proposed model instead of covariance-based SEM (CB-SEM) approaches [59]. We employed PLS-SEM due to evaluate more complicated model structures, small sample size, non-normal data, structural indicators, and facilitate theory building [65–67]. PLS offers easier testing of mediating and moderating relationships and the ability to use formative indicators, explaining its increasing popularity among international business researchers [58]. The main important reasons for applying PLS-SEM applications in this study are to examine more complex model structures or variations, for example, heterogeneity and testing of mediating relationships among the latent variables [60].

The statistical software application SmartPLS 3.2.3 [61] was used, which is very popular in the marketing and management field. A bootstrapping of 7000 sub-samples was used for analysis assumptions using the no sign changes option, bias-corrected and accelerated (BCa) bootstrap confidence interval, and two-tailed testing at 95% confidential level [62,63]. Furthermore, the statistical program Microsoft Excel was applied to enhance the participants' demographic profiles.

4. Analysis and Results

4.1. Model Assessment Using PLS-SEM

A PLS-SEM assessment involves assessing the two steps such as the measurement and structural models [64]. First, the measurement model is evaluated in terms of its validity and reliability and the relationship between each construct and its associated items [65].

Second is the structural model's assessment of the relationships between the constructs and hypotheses test [64,66].

4.2. Assessment of the Measurement Model

In the measurement model, we observed internal consistency reliability, measurement of convergent validity, discriminant validity, and HTMT. This study investigated five reflective constructs. To assess the quality of reflective constructs, convergent validity and construct reliability (i.e., internal consistency) should be evaluated, which are shown in Table 2. For convergent validity to be considered acceptable, the loading for each indicator should be higher than 0.7 [64]. All the outer loading values were above the ideal value of 0.7 except for item PEB3. However, [67] stipulates that all indicator factor loadings should be substantial and have a cut-off value of 0.50. Composite reliability (CR) tends to converge into similar values with a factor-based algorithm [68]. CR values ranged from 0.826 to 0.891, which met the 0.70 thresholds [58], suggesting very strong process reliability and error-free operation. Cronbach's alpha values of all constructs exceeded the ideal value of 0.70 without constructs environmental knowledge (0.690) and attitude (0.684). However, the CR values of environmental knowledge (0.829) and attitude (0.826) are sufficient, and all the reflective measures met the recommended levels for composite reliability and suggested very strong and error-free process reliability and.

Table 2. Assessment results of the measurement model.

Constructs	Items	Factor Loading	CR	Cronbach's α	rho_A	(AVE)	Full Collinearity VIFs	Model Types
Environmental knowledge	EK1	0.769	0.829	0.690	0.691	0.618	1.281	Reflective
	EK2	0.829					1.527	
	EK3	0.758					1.352	
Eco-label knowledge	ELK1	0.852	0.891	0.816	0.816	0.731	1.915	Reflective
	ELK2	0.878					2.055	
	ELK3	0.834					1.614	
Attitude	ATT1	0.728	0.826	0.684	0.692	0.613	1.267	
	ATT2	0.805					1.377	
	ATT3	0.812					1.374	
Green trust	GT1	0.788	0.848	0.732	0.735	0.651	1.464	Reflective
	GT2	0.828					1.642	
	GT3	0.803					1.362	
Pro-environmental behaviour	PEB1	0.736	0.868	0.816	0.823	0.526	1.602	Reflective
	PEB2	0.744					1.611	
	PEB3	0.559					1.210	
	PEB5	0.778					1.816	
	PEB6	0.764					1.749	
	PEB7	0.746					1.580	

Source: authors' explanation. Note: VIFs D variance inflation factors.

In addition, convergent validity is often assessed by way of AVE [64]. Thus, all latent variables of the AVE (Average Variance Extracted) are higher than 0.50, indicating satisfactory convergent validity [69].

Moreover, According to Dospinescu and Dospinescu, the VIF value should be less than 2.00, indicating that the data are not collinear. The VIF values for each item range from 1.210 to 2.055, which is lower than the reference value of 5 [70], suggesting that the structural model has no negative effects and no multicollinearity across items or predictor constructs. The calculation model was consistent internally with a clear convergent validity.

Discriminant validity indicates the extent to which each construct is distinct from other constructs in the model [66]. The square root of the AVE should be bigger than the construct correlations with any other construct in the model [66,71]. Table 3 reflects the diagonal entries (in bold) that signify the square root of the AVE for each construct and correlations among the constructs, indicating that the model possesses acceptable discriminant validity.

On the other hand, all ratios for HTMT were less than 0.85 ($HTMT < 0.85$) [72]. As a result, it implies that all constructs in the model displayed acceptable discriminant validity.

Table 3. Discriminant validity.

Fornell–Larcker Criterion					
Constructs	ATT	ELK	EK	GT	PEB
ATT	0.783				
ELK	0.295	0.855			
EK	0.357	0.343	0.786		
GT	0.367	0.314	0.395	0.807	
PEB	0.450	0.410	0.373	0.527	0.725
Heterotrait–Monotrait Ratio (HTMT)					
ATT					
ELK	0.392				
EK	0.517	0.461			
GT	0.515	0.396	0.553		
PEB	0.597	0.496	0.494	0.689	

Source: authors' explanation.

4.3. Assessment of the Structural Model

In the structural model, two preliminary criteria should be examined: the significance of the path coefficients and the value of the R^2 coefficients for endogenous constructs, as shown in Table 4. Path coefficients have been calculated for each relationship in the model, as well as their corresponding p -value. Nevertheless, R^2 coefficients are largely dependent upon the research area. According to [71], the values of 0.67, 0.33, and 0.19 are substantial, moderate, and weak measures of R , respectively. In behavioural studies, a value of 0.2 for R^2 is generally considered acceptable [58]. Our study represents that the model clarified 16% for attitude, 19% for green trust, and 40% for pro-environmental behaviour. Thus, attitude and green trust had relatively lower and acceptable R^2 values, and pro-environmental behaviour had a relatively high and acceptable R^2 value.

Table 4. Results of R and adjusted R square.

	R Square	R Square Adjusted
Attitude	0.161	0.16
Green trust	0.192	0.191
Pro-environmental behaviour	0.402	0.4

Source: authors' explanation.

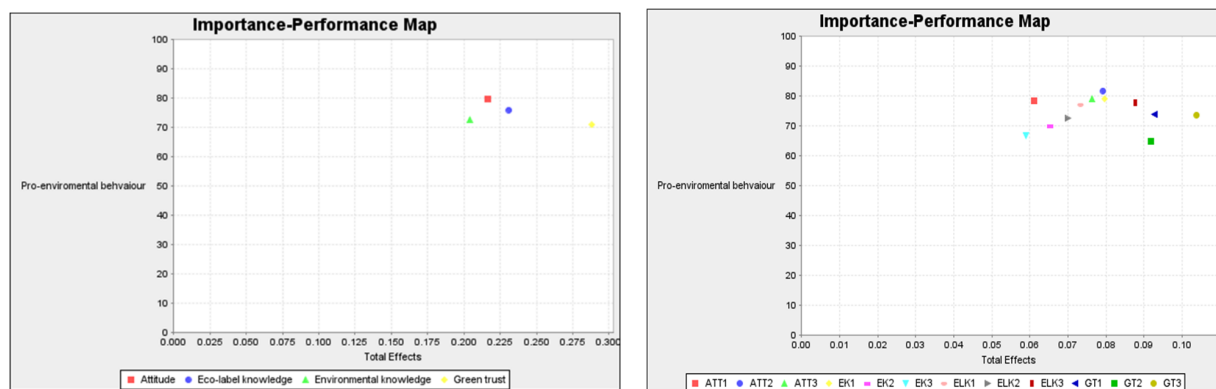
Table 5 shows the results of the path coefficient and hypotheses. Whenever the p -value is less than the optimum value of 0.05, all eight hypotheses are accepted. The effect of EK on attitude ($t = 11.152$, $p < 0.05$), GT ($t = 13.498$, $p < 0.05$), and PEB ($t = 3.178$, $p < 0.05$) were found to be positive and significant. Therefore, Hypotheses H1, H2, and H3 were supported. Nonetheless, eco-label knowledge has a significant and positive relationship with attitude ($t = 7.353$, $p < 0.05$), GT ($t = 7.341$, $p < 0.05$), and PEB ($t = 9.087$, $p < 0.05$), so the model was approved with H4, H5, and H6. However, the p -value of the correlation between attitude and PEB ($t = 7.093$, $p < 0.05$), as well as the relationship between green trust and PEB ($t = 14.340$, $p < 0.05$), was less than 0.05, indicating a significant positive relationship, confirming that hypotheses H7 and H8 were supported. Finally, GT has a significant positive influence on consumers attitude ($t = 8.093$, $p < 0.05$). Thus, H9 is accepted.

The hypothetical figure of this study is also mentioned here in Figure 2 in the following section.

Table 5. Results of hypothesis testing.

Hypothesis	Relationship	Mean	Std.	T Statistics	p Values	Supported
H1	Environmental knowledge → Attitude	0.290	0.026	11.152	0.000	Yes
H2	Environmental knowledge → Green trust	0.327	0.024	13.498	0.000	Yes
H3	Environmental knowledge → Pro-environmental behaviour	0.081	0.026	3.178	0.001	Yes
H4	Eco-label knowledge → Attitude	0.196	0.027	7.353	0.000	Yes
H5	Eco-label knowledge → Green trust	0.200	0.027	7.341	0.000	Yes
H6	Eco-label knowledge → Pro-environmental behaviour	0.233	0.026	9.087	0.000	Yes
H7	Attitude → Pro-environmental behaviour	0.204	0.029	7.093	0.000	Yes
H8	Green trust → Pro-environmental behaviour	0.348	0.024	14.340	0.000	Yes
H9	Green trust → Attitude	0.209	0.034	8.093	0.000	Yes

Source: authors' explanation.

**Figure 2.** Result of importance-performance map (IPM).

4.4. Mediation Analysis

Table 6 shows the mediation effect of attitude and green trust on the model. The path results show that a significant mediation by attitude was observed between three-dimension EK and PEB ($t = 6.749, p < 0.05$), ELK and PEB ($t = 5.392, p < 0.05$), and GT and PEB ($t = 7.745, p < 0.05$). Similarly, green trust was working as a significant mediating effect on EK and PEB ($t = 10.007, p < 0.05$) and ELK and PEB ($t = 6.397, p < 0.05$). Thus, H10a, H10b, H10c, H10d, and H10e were supported.

Table 6. Results of mediation effect of attitude and green trust.

Hypotheses	Relationships	Original Sample	Mean	Std.	T Statistics	p-Values	Results
H10a	EK → ATT → PEB	0.067	0.067	0.010	6.749	0.000	supported
H10b	ELK → ATT → PEB	0.046	0.046	0.008	5.392	0.000	supported
H10c	GT → ATT → PEB	0.052	0.0527	0.009	7.745	0.000	supported
H10d	EK → GT → PEB	0.113	0.114	0.011	10.007	0.000	supported
H10e	ELK → GT → PEB	0.070	0.070	0.011	6.397	0.000	supported

Source: authors' explanation.

4.5. Importance-Performance Map Analysis

Figure 2 shows The IPMA (importance-performance matrix analysis) map, which plots the importance and performance scores. The IPMA method helps researchers to identify constructs that carry relatively high importance but have relatively low effectiveness as independent variables [73]. Figure 2 shows an IPMA map where the total effects of environmental attitude (80.00) and eco-label knowledge (75.92) are the most important factors compared to environmental knowledge (76.83) and green trust (70.84) to define consumer pro-environmental behaviour.

5. Discussion and Conclusions

We investigate the role of environment and eco-label knowledge on attitudes and green trust towards engaging in pro-environmental consumer behaviour on energy-efficient household appliances. In addition, we investigate how attitude and green trust work as mediating roles to make a relationship with environmental knowledge and PEB, and eco-level knowledge and PEB. We proposed a new model to measure consumer pro-environmental behaviour on energy-efficient products based on previous literature. Findings of SEM suggest that environmental knowledge has positive effects on consumer attitudes and pro-environmental behaviour, which is consistent with previous studies [23,24,29], because environmental knowledge drives the promotion of energy-efficient behaviour [2].

Eco-label knowledge has a significant and positive relationship with attitude and green trust which is consistent with studies by [23,24,29]. Consumers' knowledge of eco-labels helps consumers form positive attitudes toward energy-efficient appliances and develop trust in energy-efficient products. On the other hand, positive and significant effects of eco-label knowledge on consumer pro-environmental behaviour are consistent with earlier studies [23,33]. However, a study reported contradictory findings in this regard. For example, (Taufique et al., 2017) found that knowledge of eco-labels directly influences the PEB of the emerging green market in Malaysia [24]. However, eco-label knowledge has a significant indirect, positive influence on PEB via attitudes, which is similar to our results. This is important because eco-labels are a strategic communication tool that aims at promoting PEB. The results show that an attitude has a significant and positive relationship with PEB consumers' which agreed with a previous study [24]. Positive attitudes regarding energy-efficient appliances lead to purchase intention. Our PLS-SEM shows that green trust positively influences PEB [23,24,29]. Recently, [43] proved that green trust has a significant positive relationship with the purchase experience of information and electronics products in Taiwan. If consumers trust energy-efficient products, they will be more interested in adopting energy-efficient household appliances. The result shows that attitude and green trust work as a significant and strong positive mediation relationship between EK and PEB and ELK and PEB, which are supported by previous scholars [23,24,29].

5.1. Implications

Our research links managerial implications to the marketing communication strategy around environmental knowledge, eco-label knowledge, and green trust in consumers' pro-environmental behaviour in energy-efficient household appliances. Companies should do more to raise awareness of environmental issues among consumers rather than focusing on just applying eco-labels to their products. It is also essential that firms should invest in increasing consumer awareness of eco-labels benefits [14,24]. Governments, NGOs, and environmental organizations or groups may also have to initiate advertising campaigns to establish credibility for eco-label information regarding using energy-efficient products. According to our research, environmental knowledge and eco-labels are positively associated with attitudes. Therefore, consumers should be educated about environmental issues, energy-efficient products, and eco-label specifics. Trust is the most influential factor for consumers to purchase energy-efficient products. Thus, marketing managers should use references and expert groups in advertising so that consumers can believe it. The majority of people in Bangladesh have insufficient knowledge about energy-efficient products. Thus,

government and environmental groups should make the public aware of the benefits of using energy-efficient products [50]. Studies have revealed that consumers are unable to understand what eco-labels are communicating, resulting in mistrust [15]. The findings of our study support the previous statement and indicate that firms and policymakers ought to enhance the credibility of eco-labels. Third-party eco-labelling schemes methods might be used, as they have been demonstrated to achieve a higher level of consumer trust than corporate-based information [74]. In a market where consumers are well-versed in environmental issues, third-party certification is also highlighted as the most effective tool for gaining a competitive and financial advantage [14,75–77].

5.2. Limitations and Recommendations for Future Studies

This current research has some limitations which should be considered for further study. Firstly, data are collected from developing countries in Bangladesh. Therefore, the results of developed countries can be different from our current study. Thus, it can be compared across cultures and countries to reflect the implications of consumers' pro-environmental behaviour, purchase decisions of energy-efficient products, and the sustainability of green markets. Secondly, future research may incorporate or compare our proposed model with a specific theory, e.g., the theory of planned behaviour (TPB) and a value consumption model, to understand the appropriateness of the idea. Thirdly, this study did not specify the categories of household energy-efficient products. So, further research should be conducted to categorize products to improve the optimal market segmentation approach. So, finally, this study does not consider moderate variables. In addition, we recommend considering testing future studies that might look at whether various product categories moderate the relationships between the proposed components. Further researchers should investigate the moderating effects of consumer characteristics such as demographic moderating variables, self-image, recycling, and cultural facts for future research in our suggested model.

Author Contributions: Conceptualization, M.N.; methodology, M.N.; software, M.N.; validation, M.N. and M.F.-F.; formal analysis, M.N.; investigation, M.N.; data collection, I.H.; resources, I.H. and M.F.-F.; data curation, I.H. and M.N.; writing—original draft preparation, M.N.; writing—review and editing, M.N.; visualization, M.N.; supervision, M.F.-F.; project administration, M.F.-F.; funding acquisition, M.F.-F. All authors have read and agreed to the published version of the manuscript.

Funding: The APC was funded by Doctoral School of Economic and Regional Sciences, Hungarian University of Agriculture and Life Sciences (MATE) and Stipendium Hungaricum Scholarship Programme.

Institutional Review Board Statement: This Study did not require ethical approval.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Variable measurement.

Constructs	Items	Sources
Environmental knowledge	EK1: I am familiar with energy-saving products EK2: I am very knowledgeable about energy-saving products EK3: I am knowledgeable about energy and the environment	[57,58]
Eco-label knowledge	ELK1: I know the meaning of the term 'recycled' ELK2: I know the meaning of the term 'eco-friendly' ELK3: I know the meaning of the term 'energy-efficiency'	[54]

Table A1. Cont.

Constructs	Items	Sources
Attitude	ATT1: It is important to me whether the household appliance is energy-efficient or not ATT2: Environmental protection is important to me when making purchases ATT3: If I can choose between energy-efficient household appliances and conventional products, I prefer energy-efficient ones ATT4: I have a favorable attitude toward purchasing energy-efficient appliances	[10,60]
Trust	GT1: Energy-saving products are more reliable than other comparative products GT2: Energy-saving products are more trustworthy than other comparative products GT3: Energy-saving products are more secure and keep commitments for environmental protection than other comparative products	[57,61,62]
Pro-environmental Behaviour	PEB1: I try to buy energy-saving household appliances that don't harm the environment PEB2: I have purchased a household appliance because it uses less electricity than other brands PEB3: I have replaced household appliance in my home with those of smaller wattage so that will conserve on the electricity I use PEB4: I have purchased light bulbs that were more expensive but saved energy PEB5: PIU1: I hope to use energy-saving products as much as possible PEB6: PIU2: I am likely to use energy-saving products in my life continually PEB7: PIU3: I recommend others to use energy-saving products in their houses	[1,57,63,64]

References

1. Taufique, K.M.R.; Vaithianathan, S. A fresh look at understanding Green consumer behavior among young urban Indian consumers through the lens of Theory of Planned Behavior. *J. Clean. Prod.* **2018**, *183*, 46–55. [\[CrossRef\]](#)
2. Li, Y.; Siddik, A.B.; Masukujjaman, M. Bridging Green Gaps: The Buying Intention of Energy Efficient Home Appliances and Moderation of Green Self-Identity. *Appl. Sci.* **2021**, *11*, 9878. [\[CrossRef\]](#)
3. Nekomahmud, M.; Rahman, S.; Sobhani, F.A.; Olejniczak-Szuster, K.; Fekete-Farkas, M. A systematic literature review on development of green supply chain management. *Polish J. Manag. Stud.* **2020**, *22*, 351–370. [\[CrossRef\]](#)
4. Tanwir, N.S. Predicting Purchase Intention of Hybrid Electric Vehicles: Evidence from an Emerging Economy. *World Electr. Veh. J.* **2020**, *11*, 35. [\[CrossRef\]](#)
5. Zhang, G.; Nuruzzaman, M.; Su, B. Nexus between household energy consumption and economic growth in Bangladesh (1975–2018). *Energy Policy* **2021**, *156*, 112420. [\[CrossRef\]](#)
6. Li, G.; Li, W.; Jin, Z.; Wang, Z. Influence of Environmental Concern and Knowledge on Households' Willingness to Purchase Energy-Efficient Appliances: A Case Study in. *Sustainability* **2019**, *11*, 1073. [\[CrossRef\]](#)
7. Kollmuss, A.; Agyeman, J. Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environ. Educ. Res.* **2002**, *8*, 239–260. [\[CrossRef\]](#)
8. Hasan, M.M.; Nekomahmud, M.; Yajuan, L.; Patwary, M.A. Green business value chain: A systematic review. *Sustain. Prod. Consum.* **2019**. [\[CrossRef\]](#)
9. Ahmed, F.; Al Amin, A.Q.; Hasanuzzaman, M.; Saidur, R. Alternative energy resources in Bangladesh and future prospect. *Renew. Sustain. Energy Rev.* **2013**, *25*, 698–707. [\[CrossRef\]](#)
10. Tan, C.S.; Ooi, H.Y.; Goh, Y.N. A moral extension of the theory of planned behavior to predict consumers' purchase intention for energy-efficient household appliances in Malaysia. *Energy Policy* **2017**, *107*, 459–471. [\[CrossRef\]](#)
11. Wang, Z.; Wang, X.; Guo, D. Policy implications of the purchasing intentions towards energy-efficient appliances among China's urban residents: Do subsidies work? *Energy Policy* **2017**, *102*, 430–439. [\[CrossRef\]](#)
12. De Medeiros, J.F.; Ribeiro, J.L.D.; Cortimiglia, M.N. Influence of perceived value on purchasing decisions of green products in Brazil. *J. Clean. Prod.* **2016**, *110*, 158–169. [\[CrossRef\]](#)
13. Yadav, R.; Pathak, G.S. Young consumers' intention towards buying green products in a developing nation: Extending the theory of planned behavior. *J. Clean. Prod.* **2016**, *135*, 732–739. [\[CrossRef\]](#)
14. Testa, F.; Iraldo, F.; Vaccari, A.; Ferrari, E. Why eco-labels can be effective marketing tools: Evidence from a study on Italian consumers. *Bus. Strateg. Environ.* **2015**, *24*, 252–265. [\[CrossRef\]](#)
15. Thøgersen, J. Country differences in sustainable consumption: The case of organic food. *J. Macromarketing* **2010**, *30*, 171–185. [\[CrossRef\]](#)
16. Ajzen, I.; Fishbein, M. *Understanding Attitudes and Predicting Social Behavior*; Prentice-Hall Inc.: Englewood Cliffs, NJ, USA, 1980.
17. Ajzen, I. From Intentions to Actions: A theory of Planned Behavior. In *Action Control*; Springer: Berlin/Heidelberg, Germany, 1985.

18. Klöckner, C.A.; Nayum, A.; Mehmetoglu, M. Positive and negative spillover effects from electric car purchase to car use. *Transp. Res. Part D Transp. Environ.* **2013**, *21*, 32–38. [\[CrossRef\]](#)
19. Boulstridge, E.; Carrigan, M. Do consumers really care about corporate responsibility? Highlighting the attitude—Behaviour gap. *J. Commun. Manag.* **2000**, *4*, 355–368. [\[CrossRef\]](#)
20. Davies, J.; Foxall, G.R.; Pallister, J. Marketing Theory An integrated model of recycling. *Mark. Theory* **2002**, *2*, 29–113. [\[CrossRef\]](#)
21. Polonsky, M.J.; Vocino, A.; Grau, S.L.; Garma, R.; Ferdous, A.S. The impact of general and carbon-related environmental knowledge on attitudes and behaviour of US consumers. *J. Mark. Manag.* **2012**, *28*, 238–263. [\[CrossRef\]](#)
22. Rokka, J.; Uusitalo, L. Preference for green packaging in consumer product choices—Do consumers care? *Int. J. Consum. Stud.* **2008**, *32*, 516–525. [\[CrossRef\]](#)
23. Raziuddin, K.; Siwar, C.; Chamhuri, N.; Hasan, F. Integrating General Environmental Knowledge and Eco-Label Knowledge in Understanding Ecologically Conscious Consumer Behavior. *Procedia Econ. Financ.* **2016**, *37*, 39–45. [\[CrossRef\]](#)
24. Taufique, K.M.R.; Vocino, A.; Polonsky, M.J. The influence of eco-label knowledge and trust on pro-environmental consumer behaviour in an emerging market. *J. Strateg. Mark.* **2017**, *25*, 511–529. [\[CrossRef\]](#)
25. Wang, P.; Liu, Q.; Qi, Y. Factors influencing sustainable consumption behaviors: A survey of the rural residents in China. *J. Clean. Prod.* **2014**, *63*, 152–165. [\[CrossRef\]](#)
26. Fabrigar, L.R.; Petty, R.E.; Smith, S.M.; Crites, S.L. Understanding knowledge effects on attitude-behavior consistency: The role of relevance, complexity, and amount of knowledge. *J. Pers. Soc. Psychol.* **2006**, *90*, 556–577. [\[CrossRef\]](#) [\[PubMed\]](#)
27. Kallgren, C.A.; Wood, W. Access to attitude-relevant information in memory as a determinant of attitude-behavior consistency. *J. Exp. Soc. Psychol.* **1986**, *2*, 328–338. [\[CrossRef\]](#)
28. Haron, S.A.; Paim, L.; Yahaya, N. Towards sustainable consumption: An examination of environmental knowledge among Malaysians. *Int. J. Consumer Stud.* **2005**, *29*, 426–436. [\[CrossRef\]](#)
29. Nguyen, P.; Tran, L. The influence of status orientation on green purchase intention: A case of a developing market The influence of status orientation on green purchase intention: A case of a developing market. *Int. J. Sustain. Soc.* **2021**, *13*, 129–143. [\[CrossRef\]](#)
30. Zhang, X.V.; Ha, S.; Chan, G. Do Knowledge and Experience Value Affect Green Tourism Activity Participation and Buying Decision ? A Case Study of Natural Dyeing Experience in China. *Sustainability* **2021**, *13*, 8579. [\[CrossRef\]](#)
31. Nekmahmud, M.; Fekete-Farkas, M. Green Marketing, Investment and Sustainable Development for Green Tourism. In *Tourism in Bangladesh: Investment and Development Perspectives*; Springer: Singapore, 2021.
32. Wu, L.M.; Lee, J.W.C.; Lim, Y.M.; Pek, C.K. *The Predictors of Electric Vehicles Adoption: An Extended Theory of Planned Behavior*; Al-Emran, M., Al-Sharafi, M.A., Al-Kabi, M.N., Eds.; Springer: Cham, Switzerland, 2022.
33. Waris, I.; Ahmed, W. Empirical evaluation of the antecedents of energy-efficient home appliances: Application of extended theory of planned behavior. *Manag. Environ. Qual. An Int. J.* **2020**, *31*, 915–930. [\[CrossRef\]](#)
34. Flamm, B. The impacts of environmental knowledge and attitudes on vehicle ownership and use. *Transp. Res. Part D Transp. Environ.* **2009**, *14*, 272–279. [\[CrossRef\]](#)
35. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [\[CrossRef\]](#)
36. Verma, V.K.; Chandra, B. An application of theory of planned behavior to predict young Indian consumers' green hotel visit intention. *J. Clean. Prod.* **2018**, *172*, 1152–1162. [\[CrossRef\]](#)
37. Chekima, B.; Oswald, A.I.; Wafa, S.A.W.S.K.; Chekima, K. Narrowing the gap: Factors driving organic food consumption. *J. Clean. Prod.* **2017**, *166*, 1438–1447. [\[CrossRef\]](#)
38. Naz, F.; Oláh, J.; Vasile, D.; Magda, R. Green purchase behavior of university students in Hungary: An empirical study. *Sustainability* **2020**, *12*, 10077. [\[CrossRef\]](#)
39. Amberg, N.; Fogarassy, C. Green consumer behavior in the cosmetics market. *Resources* **2019**, *8*, 137. [\[CrossRef\]](#)
40. Khan, F.; Ahmed, W.; Najmi, A. Understanding consumers' behavior intentions towards dealing with the plastic waste: Perspective of a developing country. *Resour. Conserv. Recycl.* **2019**, *142*, 49–58. [\[CrossRef\]](#)
41. Amin, S.; Tarun, M.T. Effect of consumption values on customers' green purchase intention: A mediating role of green trust. *Soc. Responsib. J.* **2020**. [\[CrossRef\]](#)
42. Chen, Y.S. The drivers of green brand equity: Green brand image, green satisfaction, and green trust. *J. Bus. Ethics* **2010**, *93*, 307–319. [\[CrossRef\]](#)
43. Ahmad, W.; Zhang, Q. Green purchase intention: Effects of electronic service quality and customer green psychology. *J. Clean. Prod.* **2020**, *267*, 122053. [\[CrossRef\]](#)
44. Muhammad, S.; Raza, M.; Yaseen, M. EconStor. 2019. Available online: www.econstor.eu (accessed on 1 February 2022).
45. Chen, M.F.; Lee, C.L. The impacts of green claims on coffee consumers' purchase intention. *Br. Food J.* **2015**, *117*, 195–209. [\[CrossRef\]](#)
46. Wasaya, A.; Saleem, M.A.; Ahmad, J.; Nazam, M.; Khan, M.M.A.; Ishfaq, M. Impact of green trust and green perceived quality on green purchase intentions: A moderation study. *Environ. Dev. Sustain.* **2021**, *23*, 13418–13435. [\[CrossRef\]](#)
47. Reichheld, F.F.; Scheffer, P. E-Loyalty: Your secret weapon on the web. *Harv. Bus. Rev.* **2000**, *78*, 105–113.
48. Alkhurshan, M.; Rjoub, H. The scope of an integrated analysis of trust, switching barriers, customer satisfaction, and loyalty. *J. Compet.* **2020**, *12*, 5–21. [\[CrossRef\]](#)
49. Ahmad, T.; Zhang, D. A critical review of comparative global historical energy consumption and future demand: The story told so far. *Energy Reports* **2020**, *6*, 1973–1991. [\[CrossRef\]](#)

50. Nekmahmud, M.; Fekete-Farkas, M. Why not green marketing? Determinates of consumers' intention to green purchase decision in a new developing nation. *Sustainability* **2020**, *12*, 7880. [\[CrossRef\]](#)
51. Daugbjerg, C.; Smed, S.; Andersen, L.M.; Schwartzman, Y. Improving Eco-labelling as an Environmental Policy Instrument: Knowledge, Trust and Organic Consumption. *J. Environ. Policy Plan.* **2014**, *16*, 559–575. [\[CrossRef\]](#)
52. Brécard, D.; Hlaimi, B.; Lucas, S.; Perraudau, Y.; Salladarré, F. Determinants of demand for green products: An application to eco-label demand for fish in Europe. *Ecol. Econ.* **2009**, *69*, 115–125. [\[CrossRef\]](#)
53. Park, E.; Kwon, S.J. What motivations drive sustainable energy-saving behavior?: An examination in South Korea. *Renew. Sustain. Energy Rev.* **2017**, *79*, 494–502. [\[CrossRef\]](#)
54. Chang, C. The interplay of product class knowledge and trial experience in attitude formation. *J. Advert.* **2004**, *33*, 83–92. [\[CrossRef\]](#)
55. Ha, H.Y.; Janda, S. Predicting consumer intentions to purchase energy-efficient products. *J. Consum. Mark.* **2012**, *29*, 461–469. [\[CrossRef\]](#)
56. Pavlou, P.A. International Journal of Electronic Commerce. *Int. J. Electron. Commer.* **2003**, *7*, 101–134.
57. Roberts, J.A. Green consumers in the 1990s: Profile and implications for advertising. *J. Bus. Res.* **1996**, *36*, 217–231. [\[CrossRef\]](#)
58. Hair, J.F.; Sarstedt, M.; Hopkins, L.; Kuppelwieser, V.G. Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *Eur. Bus. Rev.* **2014**, *26*, 106–121. [\[CrossRef\]](#)
59. Lohmöller, J.-B. Predictive vs. Structural Modeling: PLS vs. ML. In *Latent Variable Path Modeling with Partial Least Squares*; Springer: Berlin/Heidelberg, Germany, 1989; pp. 199–226. [\[CrossRef\]](#)
60. Hair, J.F.; Hult, G.T.M.; Ringle, C.M.; Sarstedt, M. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*, 3rd ed.; Sage: Thousand Oaks, CA, USA, 2022.
61. Ringle, C.M.; Wende, S.; Becker, J.-M. *SmartPLS 3.0*; SmartPLS: Bönningstedt, Germany, 2015.
62. Aguirre-Urreta, M.I.; Rönkkö, M. Statistical inference with PLSc using bootstrap confidence intervals1. *MIS Q. Manag. Inf. Syst.* **2018**, *42*, 1001–1020. [\[CrossRef\]](#)
63. Cheah, J.; Amran, A.; Yahya, S. External oriented resources and social enterprises' performance: The dominant mediating role of formal business planning. *J. Clean. Prod.* **2019**, *236*, 117693. [\[CrossRef\]](#)
64. Hair, J.F.; Ringle, C.M.; Sarstedt, M. PLS-SEM: Indeed a silver bullet. *J. Mark. Theory Pract.* **2011**, *19*, 139–152. [\[CrossRef\]](#)
65. Ebrahimi, P.; Basirat, M.; Yousefi, A.; Nekmahmud, M.; Gholampour, A.; Fekete-Farkas, M. Social Networks Marketing and Consumer Purchase Behavior: The Combination of SEM and Unsupervised Machine Learning Approaches. *Big Data Cogn. Comput.* **2022**, *6*, 35. [\[CrossRef\]](#)
66. Vinzi, V.E.; Chin, W.W.; Henseler, J.; Wang, H. Handbook of Partial Least Squares. *Handb. Partial. Least Sq.* **2010**, 171–193. [\[CrossRef\]](#)
67. Fornell, C.; Larcker, D.F. Fornell, C.; Larcker, D.F. Evaluating structural equation models with unobservable variables and.pdf. *J. Mark. Res.* **1981**, *XVIII*, 39–50. [\[CrossRef\]](#)
68. Kock, N. Common method bias in PLS-SEM: A full collinearity assessment approach. *Int. J. e-Collab.* **2015**, *11*, 1–10. [\[CrossRef\]](#)
69. Anderson, J.C.; Gerbing, D.W. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychol. Bull.* **1988**, *103*, 411–423. [\[CrossRef\]](#)
70. Hair, J.F.; Hult, G.T.M.; Ringle, C.M.; Sarstedt, M.; Thiele, K.O. Mirror, mirror on the wall: A comparative evaluation of composite-based structural equation modeling methods. *J. Acad. Mark. Sci.* **2017**, *45*, 616–632. [\[CrossRef\]](#)
71. Chin, W.W. The partial least squares approach to structural equation modelling. *Mod. Methods Bus. Res.* **1998**, *295*, 295–336.
72. Henseler, J.; Ringle, C.M.; Sarstedt, M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Mark. Sci.* **2015**, *43*, 115–135. [\[CrossRef\]](#)
73. Hair, J.F., Jr.; Sarstedt, M.; Ringle, C.M.; Gudergan, S.P. *Advanced Issues in Partial Least Squares Structural Equation Modeling*; SAGE Publications Ltd: London, UK, 2017.
74. Atkinson, L.; Rosenthal, S. Signaling the green sell: The influence of eco-label source, argument specificity, and product involvement on consumer trust. *J. Advert.* **2014**, *43*, 33–45. [\[CrossRef\]](#)
75. Hasan, M.M.; Popp, J.; Oláh, J. Current landscape and influence of big data on finance. *J. Big Data* **2020**, *7*. [\[CrossRef\]](#)
76. Hasan, M.M.; Yajuan, L.; Khan, S. Promoting China's Inclusive Finance Through Digital Financial Services. *Glob. Bus. Rev.* **2020**, 1–23. [\[CrossRef\]](#)
77. Hasan, M.; Noor, T.; Gao, J.; Usman, M.; Abedin, M.Z. Rural Consumers' Financial Literacy and Access to FinTech Services. *J. Knowl. Econ.* **2022**. [\[CrossRef\]](#)