

# Promoting Energy Efficiency in an Emerging Market: Insights and Intervention Strategies

*The Ninh Nguyen, Thuy Hong Pham, Thi Thanh Nhan Nguyen,  
Minh Duc Chu, and Thu Huong Pham from Hanoi, Vietnam*

## ABSTRACT

Promoting energy efficiency and conservation is an urgent imperative in responding to the need to reduce carbon dioxide emissions, particularly in emerging markets. This article provides insights into factors that may enhance or impede the purchase of energy-efficient household appliances in Vietnam. It also suggests intervention strategies to enhance the motivators and mitigate the barriers associated with energy-efficient appliance purchases. Data were collected from shoppers in popular electronics and appliance stores. The findings reveal that consumer purchasing behaviors are motivated by long-term savings, environmental protection, social influence, green self-identity and innovative technologies. Major barriers include lack of information, low level of credibility of energy rating labels, high prices, time consumption and limited product range.

This article is of interest to policy-makers, social-environmental organizations, manufacturers and retailers in the development of more effective strategies for promoting energy efficiency and conservation. It extends current knowledge about environmentally responsible behavior in emerging markets such as Vietnam.

## INTRODUCTION

Energy consumption, which is a primary cause of climate change and its associated environmental problems, is projected to increase by one-third from current levels through to 2040 [1]. Notably, annual climate change adaptation costs are predicted to reach \$300 billion by

2050 [2]. It is imperative to enhance energy efficiency and conservation initiatives that offer both environmental and economic benefits [3-5].

Several researchers assert that using energy-efficient products provides greater potential for savings than energy curtailment behaviors [6,7]. It is imperative to accelerate the adoption of energy-efficient products in households that are major contributors to greenhouse gas emissions [8]. Promoting energy-efficient household products should be particularly prioritized in emerging markets where rising consumer power is observed and growing energy use is evident [9].

Previous research has investigated various personal, social and marketing determinants of consumer purchase of energy-efficient products including values, knowledge, attitude, social influence, price and advertising [10-12]. Nonetheless, Tangari and Smith argue that the factors influencing the purchase and consumption of energy-efficient products have not been fully understood [13]. As most prior research has focused on developed countries, the current knowledge about energy-efficient appliance purchasing in emerging markets is limited [14].

Vietnam has a population of 94 million and its increasing consumer income demonstrates its importance as an emerging market in the Southeast Asia [15]. The country is typical of many growing energy-dependent economies with energy demand that is expected to triple over the next decade [16]. Notably, electricity will represent approximately 25% of total energy consumption in 2025. Household electricity usage is of particular concern due to the growth in the percentage of households owning major appliances such as refrigerators (10.9% to 49%) and air conditioners (1.1% to 9.2%) [17].

Vietnam has suffered from a doubling of carbon dioxide (CO<sub>2</sub>) emissions and rising sea levels over the last ten years [18]. In an effort to expand the domestic demand for energy-efficient products, the government issued the National Energy Efficiency Standard and Labelling scheme for all lighting systems and selected appliances. This administrative measurement is echoed by domestic and international marketers' commitment to marketing more energy-efficient appliances. Despite these initiatives, consumers in Vietnam seem to be in the beginning stage of green purchasing, and generally lack opportunities for more sustainable living [19].

This article examines key factors that may enhance or impede consumer purchase of energy-efficient appliances in Vietnam. By doing so, it extends extant knowledge about pro-environmental purchase

behaviors in emerging markets. Given the gap pertaining to effective intervention strategies to promote energy-efficient products [20], this article proposes strategies which influence consumer behavior towards such products.

## METHODOLOGIES

A hard copy survey was employed to collect data from Vietnamese citizens aged 18 and over who have purchased energy-efficient appliances (i.e., refrigerators, washing machines, air conditioners, rice cookers and cooling fans) during a six-month period. The survey was carefully developed and then pre-tested using two focus groups and six in-depth interviews. The intention was to eliminate potential issues associated with answering the questions and recording the data [21]. The final survey comprises two screening questions and three main sections. The first main section sought general information about the purchase, such as reasons for purchasing, information sources, where to purchase and payment methods. The second section identified the customer's motivations to purchase energy-efficient appliances and the perceived barriers to the purchase. The third section included key demographic questions.

The survey was administered to eligible shoppers who visited five electronics and appliance specialty stores in Vietnam's two most populated cities, Hanoi (7.6 million) and Ho Chi Minh City (8.4 million). Such stores were selected because they are the country's main distributors of electrical appliances [22]. Ten trained interviewers approached every fifth consumer entering the stores and asked them to voluntarily provide responses. The interviewers verbally assured the respondents that their anonymity and privacy would be respected and that there were no correct or incorrect answers. These procedures assisted in minimizing social desirability in providing responses [23].

The data collection period in the stores lasted from December 2015 to February 2016, during which time a total of 390 surveys (195 in each city) were collected. During the data screening, 8 surveys were eliminated for having missing values. The final effective sample size was 382. The ratio of men to women was 52:48. Respondents aged 18-29 represented 36% of the sample, and the marriage incident was 61%. Notably, the vast majority of the respondents (70%) held university degree qualifications.

RESULTS AND DISCUSSION

**Consumer Purchases of Energy-efficient Appliances**

The most common reason for purchasing the appliances was to purchase one for the first time (38.2%). Interestingly, a number of customers (23.8%) purchased the appliances for energy-efficiency reasons. The internet was the most popular source of product information (31.7%), reflecting the sustained growth in internet users in Vietnam over the last ten years [24]. Consumers also sought information from their families, friends and colleagues (17.3%). With regard to preferred types of outlets, electronics and appliance specialty marts were the top choice for consumers shopping for energy-efficient products. Cash was the dominant form of payment (75.1%). Finally, respondents demonstrated a relatively low level of knowledge about the energy-efficient appliances ( $M = 3.90$ ). Table 1 shows key dimensions associated with the purchase of the considered energy-efficient appliances.

**Table 1. Key dimensions regarding consumer purchase behavior.**

<i>Reasons for purchasing</i>	Purchase one for the first time (38.2%); replace an old one for more energy efficiency (23.8%); replace a broken one (20.9%); replace an old one for better quality (13.1%); others (4.0%).
<i>Information sources</i>	Internet (31.7%); shop/retail outlets (29.3%); family, friends and colleagues (17.3%); television and radio advertisements (9.9%); print media (7.3%); others (4.5%).
<i>Types of stores</i>	Electronics and appliance specialty marts (72.6%); small specialty stores (12.8%); online stores (10.7%); department stores; others (3.9%).
<i>Payment method</i>	Cash (75.1%); bank cards (21.2%); others (3.7%).
<i>Knowledge</i>	Respondents rate their knowledge about energy efficient appliances on a scale ranging from 1 – ‘Not at all knowledgeable’ to 7 – ‘Very knowledgeable’ ( $M = 3.90$ ; $SD = 1.27$ ).

**Factors Influencing Energy-efficient Appliance Purchases**

Long-term savings was the most relevant reason for purchasing energy-efficient appliances. Consumers’ purchase behavior was heavily influenced by their perception that energy-efficient appliances save energy costs in the long run. This is particularly important because of

Vietnam's skyrocketing electricity prices. This finding is similar to that of Gaspar and Antunes [10, 25].

Respondents were also concerned about the environment when considering household electrical appliances. Consistent with previous studies [11,14], consumers of energy-efficient household appliances believe that such products are important for reducing air pollution and also for saving natural resources used to produce energy such as coal and water. Another important motive was related to social and peer influence. This supports an earlier finding that subjective social norms representing perceived social pressure positively influence consumer purchase of energy-efficient appliances [26]. This finding reflects Vietnam's highly collectivist culture where individuals' behavior is typically motivated by social influence and approval [27]. Key motives and barriers that affect consumer purchase of energy-efficient appliances are presented in Table 2.

**Table 2. Motives and barriers regarding consumer purchase of energy-efficient appliances.**

	<i>Minimum</i>	<i>Maximum</i>	<i>M</i>	<i>SD</i>
<b>Motives</b>				
Long-term savings	2	7	5.11	1.17
Environmental protection	2	7	5.08	1.27
Social and peer influence	1	7	5.03	1.51
Green self-identity	1	7	5.01	1.37
Innovative technology	1	7	4.81	1.22
Feeling of contribution	1	7	4.76	1.30
<b>Barriers</b>				
Lack of information	1	7	4.01	1.31
High price	1	7	3.18	1.25
Distrust in energy-rating labels	1	7	3.08	1.29
Extra time	1	7	3.04	1.25
Limited product range	1	7	3.00	1.26

*Note:* Seven-point Likert scale was used (1 – ‘Strongly disagree’ to 7 – ‘Strongly agree’); *M*: mean; *SD*: standard deviation

Green (environmental) self-identity also motivated consumers to purchase energy-efficient appliances. Such purchasing made consumers feel that they were environmentally friendly consumers. Interestingly, consumers also demonstrated the feeling of contribution to the well-being of humanity when buying energy-efficient appliances. These findings extend prior research in the field of green purchasing behavior [28].

The major factors that impeded the purchases included lack of information, high perceived price, low level of credibility of energy-rating labels, extra time and limited product range. These findings support and extend earlier research on barriers to consumer purchase of green products including energy-efficient appliances [26,29,30]. Lack of information was the most significant hindrance to consumer purchase behavior, indicating poor communication and information programs undertaken by public organizations and marketers. Given the widespread financial constraints among consumers in developing countries including Vietnam, product cost was also a strong barrier. Notably, consumers generally did not believe in the credibility of energy-rating labels. Possible explanations for such distrust consist of marketers' misuse of the labels, lack of transparency, and inadequate governmental control of eco-labeling programs.

**Gender Differences in Purchasing Behaviors**

Several studies report the differences between men and women in pro-environmental purchase behaviors [25, 31-33]. However, their findings are inconsistent. Therefore, a series of independent *t*-tests were performed to investigate gender differences in the determinants of energy-efficient appliance purchasing. Table 3 provides the significant results between men and women.

**Table 3.**  
**Summary of *t*-test results regarding gender-related purchase determinants.**

	<i>Women</i>		<i>Men</i>		<i>p-value</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Long-term savings	5.24	1.22	5.00	1.12	0.048
Lack of information	4.19	1.36	3.85	1.23	0.010

The independent samples *t*-test results reveal that women considered long-term energy cost savings significantly more when purchasing energy-efficient appliances ( $p < 0.05$ ). Also, women indicated a lack of information significantly more when searching for the appliances ( $p < 0.05$ ). Possible explanations for these findings include: 1) women are largely accountable for managing household budgets; and, 2) they demand more information on the products they are considering to purchase for their decision-making processes.

## INTERVENTION STRATEGIES

This study's findings have important implications for key stakeholders including the government, social-environmental organizations and marketers in the promotion of energy-efficient appliances. Specifically, it would enable the stakeholders to develop more effective communication, information and intervention strategies for mitigating the major hindrances to energy-efficient appliance purchasing.

### **Communication and Information Strategies**

Communication strategies should be developed and implemented jointly by governmental organizations, marketers, environmental campaigners and social institutions. As household appliance purchases are generally shared decisions, communications should target different consumer groups including both men and women to accelerate the adoption of the energy-efficient appliances nationwide. Nevertheless, women generally require more information, and they are heavily influenced by the energy cost saving advantages.

Communication messages need to be appealing and consistent to best influence consumers' decision-making processes. Such messages need to enhance the motivators and reduce the lack of information associated with the purchase of energy-efficient appliances. The key messages to communicate should include:

- That purchasing energy-efficient appliances is beneficial for environmental protection (i.e., reducing CO<sub>2</sub> emissions and saving natural resources), personal health, and the impacts on future generations.
- That purchasing energy-efficient appliances is supported by family, friends, colleagues, celebrities and community leaders.
- That purchasing energy-efficient appliances demonstrates the image of environmentally responsible consumers.
- That the energy-rating labels are credible and useful in evaluating energy-efficient appliances.
- That eco-labels programs are carefully managed by the government.
- That consumption of energy-efficient appliances offers long-term savings.
- That the higher cost of energy-efficient appliances reflects their higher quality, innovative technologies and reliability.

Communication managers need to use various modes of communication utilizing customer touch points to deliver the above messages. The key touch points are:

- *Internet.* This is most popular source of information for consumers in Vietnam. Younger consumers (aged 21-29) spend over 24 hours weekly on the internet [34]. Hence, the internet should be particularly used to reach younger consumers. It offers promising opportunities to market environmentally friendly products [35].
- *In-store communications.* Given that the majority of products are purchased in various brick-and-mortar stores, in-store communications are fundamental. Knowledgeable and committed sales assistants should provide clear and honest information about energy-efficient products. Furthermore, point of purchase displays including signage, shelf displays and banners should be utilized efficiently.
- *Consumer forums.* Given the significant role of social groups in consumer purchases, marketers should provide both online and offline forums for customers to exchange experience relating to the purchase and consumption of energy-efficient appliances.
- *Education events and programs.* Communication messages can be delivered via education events and programs which can be co-organized by manufacturers, retailers and other social institutions such as universities, schools and youth unions. Such events may feature speeches by relevant celebrities or environmental experts who have strong influence on the target audience.
- *Television advertisements and print media.* Since 72% of Vietnamese consumers watch broadcast television [34], commercials can be utilized. Manufacturers and retailers should use attractive and creative brochures, booklets, posters and leaflets providing consumers with detailed information about the characteristics of energy-efficient appliances.

It is essential that stakeholders carefully evaluate the efficiencies of their communication strategies by surveying the target audience. Such measurement enables improvements on dimensions of communication strategies including the messages, communication channels, and the optimal mix of various communication platforms.



### Other Strategies for Mitigating the Purchase Barriers

The high perceived prices of energy-efficient appliances should be addressed by introducing consumer subsidies including reward points, rebates and financial options that help reduce monetary costs associated with consumer purchase behavior. It is imperative that marketers assure that such products are more widely available in retail stores. Retailers should also provide more understandable and attractive signage in their stores. Regarding energy rating labels, governments should introduce and strengthen regulations pertaining to the display of authentic certification and labeling of eco-friendly products.

### CONCLUSION

This article provides new insights into the motives and barriers associated with consumer purchase of energy-efficient appliances. The comprehensive understanding about determinants affecting energy-efficient product purchases has been identified as an information gap by the literature reviewed [13]. By focusing on Vietnam, this article enriches the evolving literature relating to green purchasing decisions in emerging markets that have received sparse attention from researchers. In addition to a theoretical contribution, this article also suggests communication and information strategies that enhance the motivators of consumer purchase, plus strategic interventions that mitigate the purchase barriers. Importantly, successful strategies aimed at changing consumer behavior towards more energy-efficient purchases require on-going dedication and resource commitment from policy-makers, social-environmental organizations and marketers.

### References

- [1] International Energy Agency (2016). *Energy and Air Pollution – World Energy Outlook Special Report*. Paris, France: OECD.
- [2] UNEP (2015). *UNEP 2014 Annual Report*. Nairobi: UNEP.
- [3] Korakan, A. (2009). New approaches for energy efficiency market penetration. *Strategic Planning for Energy and the Environment*, 29(1), pages 7-14.
- [4] Ottinger, R. (2010). Energy efficiency: the best immediate option for a secure, clean, and healthy future. *Strategic Planning for Energy and the Environment*, 30(2), pages 20-44.
- [5] Russell, C. (2017). Discerning the multiple business benefits of energy efficiency. *Strategic Planning for Energy and the Environment*, 36(4), pages 24-40.
- [6] Gardner, G. and Stern, P. (2002). *Environmental problems and human behavior* (2nd ed.). Boston, Massachusetts: Pearson.

- [7] Oikonomou, V., Becchis, F., Steg, L. and Russolillo, D. (2009). Energy saving and energy efficiency concepts for policy making. *Energy Policy*, 37(11), pages 4,787-47,96.
- [8] Pothitou, M., Hanna, R. and Chalvatzis, K. (2016). Environmental knowledge, pro-environmental behaviour and energy savings in households: an empirical study. *Applied Energy*, 184, pages 1,217-1,229.
- [9] Keho, Y. (2016). What drives energy consumption in developing countries? The experience of selected African countries. *Energy Policy*, 91, pages 233-246.
- [10] Gaspar, R. and Antunes, D. (2016). Energy efficiency and appliance's characteristics considered prior to purchase: Differences and similarities between the United Kingdom, Germany, Portugal, Greece, Poland, Spain and Italy. *International Journal of Green Energy*, 13(6), pages 546-555.
- [11] Ha, H., and Janda, S. (2012). Predicting consumer intentions to purchase energy-efficient products. *Journal of Consumer Marketing*, 29(7), pages 461-469.
- [12] Nguyen, T., Lobo, A. and Greenland, S. (2017). Energy efficient household appliances in emerging markets: the influence of consumers' values and knowledge on their attitudes and purchase behaviour. *International Journal of Consumer Studies*, 41(2), pages 167-177.
- [13] Tangari, A. and Smith, R. (2012). How the temporal framing of energy savings influences consumer product evaluations and choice. *Psychology and Marketing*, 29(4), pages 198-208.
- [14] Nguyen, T., Lobo, A. and Greenland, S. (2016). Pro-environmental purchase behaviour: the role of consumers' biospheric values. *Journal of Retailing and Consumer Services*, 33, pages 98-108.
- [15] Euromonitor International (2017). Population Passport. <https://www.portal.euromonitor.com/portal/statistics>.
- [16] Energy Efficiency and Conservation Office (2012). *Policies and Initiatives on Energy Efficiency and Conservation in Vietnam*. Hanoi: Energy Efficiency and Conservation Office.
- [17] General Statistics Office of Vietnam (2012). *Vietnam Household Living Standards Survey 2012*. Hanoi: GSO.
- [18] World Bank (2017). Data—Vietnam. <http://data.worldbank.org/country/vietnam>.
- [19] de Koning, J., Crul, M., Wever, R. and Brezet, J. (2015). Sustainable consumption in Vietnam: an explorative study among the urban middle class. *International Journal of Consumer Studies*, 39(6), pages 608-618.
- [20] de la Rue du Can, S., Leventis, G., Phadke, A. and Gopal, A. (2014). Design of incentive programs for accelerating penetration of energy-efficient appliances. *Energy Policy*, 72, pages 56-66.
- [21] Bell, J. (2010). *Doing Your Research Project* (5th ed.). London: Open University Press.
- [22] Euromonitor International (2016). Consumer Appliances in Vietnam. <http://www.euromonitor.com/consumer-appliances-in-vietnam/report>.
- [23] Podsakoff, P., MacKenzie, S. and Podsakoff, N. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, pages 539-569.
- [24] World Bank (2016). *World Bank East Asia and Pacific Economic Update April 2016: Growing Challenges*. Washington: World Bank Publications.
- [25] Gaspar, R., and Antunes, D. (2011). Energy efficiency and appliance purchases in Europe: consumer profiles and choice determinants. *Energy Policy*, 39(11), pages 7,335-7,346.
- [26] Nguyen, T., Lobo, A. and Greenland, S. (2017). The influence of cultural values on green purchase behaviour. *Marketing Intelligence and Planning*, 35(3), pages 377-396.
- [27] Hofstede, G. (2001). *Culture's consequences: comparing values, behaviors, institutions,*

- and organizations across nations (2nd ed.). Thousand Oaks, California, London: Sage.
- [28] Nguyen, T., Lobo, A. and Nguyen, B. (2017). Young consumers' green purchase behaviour in an emerging market. *Journal of Strategic Marketing*. doi: 10.1080/0965254X.2017.1318946.
- [29] Barbarossa, C. and De Pelsmacker, P. (2016). Positive and negative antecedents of purchasing eco-friendly Products: a comparison between green and non-green consumers. *Journal of Business Ethics*, 134(2), pages 229-247.
- [30] Wang, G., Wang, Y. and Zhao, T. (2008). Analysis of interactions among the barriers to energy saving in China. *Energy Policy*, 36(6), pages 1,879-1,889.
- [31] Costa Pinto, D., Herter, M., Rossi, P. and Borges, A. (2014). Going green for self or for others? Gender and identity salience effects on sustainable consumption. *International Journal of Consumer Studies*, 38(5), pages 540-549.
- [32] Lee, K. (2009). Gender differences in Hong Kong adolescent consumers' green purchasing behavior. *Journal of Consumer Marketing*, 26(2), pages 87-96.
- [33] Mostafa, M. (2007). Gender differences in Egyptian consumers' green purchase behaviour: the effects of environmental knowledge, concern and attitude. *International Journal of Consumer Studies*, 31(3), pages 220-229.
- [34] Tran, V. and Nguyen, D. (2016). Vietnamese spend around three full work days online each week.
- [35] Nguyen, T., Phan, T., Cao, T. and Nguyen, H. (2017). Green purchase behavior: mitigating barriers in developing countries. *Strategic Direction*, 33(8), pages 4-6.

## ABOUT THE AUTHORS

**The Ninh Nguyen** is lecturer of marketing at Thuongmai University (Vietnam University of Commerce), Hanoi, Vietnam. His research interests include pro-environmental behavior, green marketing, energy efficiency, and strategic management. His research has appeared in several internationally recognized journals including the *International Journal of Consumer Studies*, *Journal of Strategic Marketing*, *Journal of Retailing and Consumer Services*, *Journal of Consumer Behavior*, *Marketing Intelligence and Planning* and *Sustainability*.

**Thuy Hong Pham** is an associate professor of marketing at Thuongmai University, Hanoi, Vietnam.

**Thi Thanh Nhan Nguyen** is the associate dean, faculty of marketing at Thuongmai University, Hanoi, Vietnam

**Minh Duc Chu** is based at the Hanoi Power Corporation, Hanoi, Vietnam.

**Thu Huong Pham** is an associate professor of marketing at Foreign Trade University, Hanoi, Vietnam.