Investigating Consumer's Purchase Behavior of Energy Efficient Appliances (Labelling Wise)

Siti Aminah Binti Harun[1], Muhammad Ashraf Bin Fauri @ Fauzi[2,] Adekunle Qudus Adeleke[3]

[1 ,2, 3] Faculty of Industrial Management, University Malaysia of Pahang (UMP) Gambang, Pahang

sitiaminahbintiharun@yahoo.com

Abstract

Investigating consumer's purchase of energy efficient appliances recently become an impact interest for the researchers especially in sustainability and consumer behavior field. This study at the beginning will be introducing the basic understanding of the importance of the recent trending in consumer purchased on energy efficient appliances within the the labelling perspective. Consumer purchasing decisions are complex, extending beyond factors affecting individuals during purchase. Purchasing is an ability of consumers to make rational decisions on purchasing investments. The study is based on the TPB model and the framework was explored by various factor of labelling wise.

1. Introduction

Educating the consumer in purchasing energy efficient appliances with efficiency label, symbol and advertisement is currently being study in depth (Company, 2008; Shi, 2015; Vahdat et al., 2020). Energy efficient appliances in today's market are equipped with environmental labelling, indicating a specific rating of appliance energy efficient. It provides accurate estimation of the product environmental performance that can facilitate consumers purchase decision (Taufique et al., 2017; Taufique & Vaithianathan, 2018). Labelling electrical appliance with environmental tag would facilitate consumers to be concern with environmental issues in making decision to purchase (Park, 2017). Consumers will be informed on the amount of energy usage by certain appliances and can make decision that would benefit the environment and thus reduce climate change.

Likewise, the decision in purchasing will facilitate the energy efficient behaviour. Energy efficient behavior is interchangeably use with energy saving behaviour. It can be defined as the behavior that consumers taken for beneficial use only of overall energy consumed (Zhong et. al., 2016). While having energy efficient behaviour by purchasing energy efficient appliances, the other behaviour also included in this type of energy saving. This behaviour is either buying new product or replacing old item with new energy efficient appliance (Tan et al., 2017). Another term, "sustainable consumption" reflect the use of goods and service that conform to the life basic needs and bring better quality in living by minimizing the use of the earth resources (Paul et al., 2016). This is to reduce the adverse effect of toxic materials and emission of waste and pollutants of hazardous elements that within a period of a life cycle, to as not depriving and jeopardizing the fate of the next generation. Households energy consumption contribute to more than a quarter of energy use (Pothitou et al., 2016).

In today's modern society, educating customer in purchasing energy efficient appliances are different depending on the context of socio-economic, culture and level of education (Hu et al., 2020; Mahardika et al., 2020a). Hence, this study is proposing a framework to understand consumer's energy efficient appliances, of which usually would be facilitated by labelling. Understanding relevant and potential factors that stimulate and reassure consumer to purchase energy efficient appliances would help relevant authorities to mitigate problems of energy consumption with regards to domestic energy efficient appliances. Mediating of energy consumption issues which is reduce the carbon footprint, researcher need re-educating the consumer behavior and guiding them to purchase with higher awareness decision (Damigos et al., 2020; Nuwan et al., 2020a; Pamulapati et al., 2020) and leading to factors wise during purchased the materials (Baldini et al., 2018; Sakah et al., 2019; Wang et al., 2017; Wilson, 1993).

2. Literature Review

Classifying and investigating consumer's purchase of energy efficient appliances research in Malaysia is motivating by numerous view of point in energy usage aspects. It started with the manufacturing, advertisement, and purchasing. Yet, the focus of the study is by exploring the consumer's purchase of the energy efficient appliances.

The developing of countries, increase of socioeconomicstatus level and standard of living became the main contributor to the energy consuming in Malaysia. The recent research shown the residential appliances especially electrical appliances contribute the most. Hence its influence the researcher to investigate the core sectors being involved. The main sector that being discussed in accelerating the used or energy consuming include manufacture, marketing and entrepreneur. These three sectors were initiate increase the flow of consumer purchased and increase the surrounding economic and SES (Apipuchayakul & Vassanadumrongdee, 2020; Taufique & Vaithianathan, 2018). In other word, economic and social influence the usage of energy across the world. Malaysia also is not left behind in this matters.

The research in energy saving among Malaysian consumer started vigorously in early 2005 and begin to extend year by year as far its concerned the perception of customers, intention to purchase with regard of environmental abuse and product packaging like symbol and label only (Mahlia et al., 2005a; Salleh et al., 2019). Compared with Malaysia energy usage, the current state of energy usage from the Southeast Asian countries view increase the awareness on the purchasing of energy efficient appliances, as the level of usage is uncontrollable at certain state in certain Southeast Asian countries like Vietnam and South Korea. (Damigos et al., 2020a; Kwon et al., 2020; Sakah et al., 2019a). The recent research regarding energy efficient appliances and consumer purchase across the world and Malaysia

2.1 Energy Efficient Appliance and Nature of Customer Purchasing

Customer purchased intention and customer awareness of purchasing product became the main input for behavior researcher, especially by this effortless of customer decision making of unclear distinct factors (Issock et al., 2018) of customer purchased for one particular energy efficient appliances. The green energy technology was applied for household appliances, many researches have been conducted and handful gathered information about this purchased behavior toward energy efficient appliances (Zhang et al., 2020a). Other familiar name for this behavior is “green appliances”, “electrical energy saver appliances” and “efficient saver appliances”. For same cases, due to high demand of electricity usage, household appliances listed among the sources of environmental breakdown compared manufacturer appliances (Lim, et al., & Hossain, 2016; Mizobuchi & Takeuchi, 2016a) and office appliances. Hence direct actions being taken for this seriousness of household appliances and energy efficient household appliances were

introduced and became noticeable. Purchasing and purchased is among of the main contact of human behavior in continuing their live with others. Researchers highly evacuate this aspects, and crucially it became one interest part in investigating customer emotion development towards purchased behavior.

Industrial management facilities communicate the energy efficiency appliances based on the measurement standards. Pattern of electricity suppliers (wattage (W) and loading for each appliance differ with another. For instance, household appliances such as Light Emitting Diode (LED) used electricity 6W in emitted the light diodes in helping human activities during night, refrigerators and freezers used electricity 780W to sustain the quality of storage, and air conditioner used electricity 3, 500W to give out the cool air for consumers (Huh et al., 2019a). At the end each of this household appliances will emit the same substance and handful to the increases of air pollution (Kemmler et al., 2018). Consciousness with these problems, many energy efficient appliances was introduced with various name, labelling and minimal wattage used such as eco-LED, green saver freezer and energy star refrigerators.

Malaysia is serious in promoting consumer in purchasing energy efficient appliance. This is due to pollution occurring such as tremendous polluted river in Sungai Buloh and Johor state from 1995 to 2018 (Lim & Hossain, 2016; Rahbar & Wahid, 2010; Rashid, 2009; Sekar et al., 2019). The contributor of these case highly related with the influence of purchasing by the customers. Researchers determined many factors that influence purchased or buying intention.

Consumer purchasing on domestic appliances, electrical appliances and home appliances became seriously discuss, especially those intend to environmental concern and sustainability. Energy efficient appliances research output was introduced with different output report across the countries (Debnath et al., 2019; He et al., 2019; Huse et al., 2020; Jakučionytė et al., 2020; Mahisekar & Jadhav, 2020; Twerefou & Abeney, 2020). Each the study given out report to government, organizations, and researchers to cumulate the statistic figure and enhance the awareness of consumers in vulnerably for not purchasing energy efficient appliances especially domestic appliances. For example, in southeast countries, Department of Energy (DOE) reported the current figure, whereas western countries, Energy Commission simplify the statistics consumption, then Swiss Federal Office of Energy (SFOE) shown European energy polluted, at the same time Demand Side Management (DSM) emphasized the large scale energy efficiency

technologies to improve the household appliances (Agyarko et al., 2020) and for global manufacturers, consumers and institutions will refer to International Energy Agency (IEA) report pattern. The implementation of energy efficiency (EE) measures is considered a key strategy for reducing non-renewable energy consumption and CO2 emissions globally (Gerke et al., 2017; Rajagopal et al., 2019).

Encouraged with this global issues on polluted environment, the researcher committed to explore more on increasing the purchasing of inner drive on energy efficient household's appliances and reduce the potential aspects that that can reduce that behavior. Environmental factor plays an impact for intention purchased of this green saver appliances. Consumer becomes knowledgeable about the advantages and disadvantages of lesser awareness and affect to the increasing number of chemical emission into the air. The knowledge may promote a favorable attitude toward carbon reduced behavior which is lead to consumer's purchase of energy efficient appliances and towards reducing carbon footprint (Chuar, 2015: Follows, 2000). Understanding the depth of environmental problems and help to improve quality of life with enhancing concern to environment and change purchase behavior in the correct way.

Psychologically, people tend to be realistic what had done and will be done. Most of the outcome should be giving back to themselves instead benefit others. Interestingly, environmental concern can increase the behaviors of saving energy among consumers while they purchased the energy efficiency appliances instead of having mind thinkers what these behaviors can be helpful financially and harmless (Scasny, 2012). Obligation of this purchased energy efficient behavior toward energy efficient household appliances spread mutuality among consumers and manufactures.

Consumer purchasing towards energy efficient appliances, can be one of the factors directly by the characteristics of the product itself. The product can be categorized into two group which is heterogeneous and homogeneous. Psychologist specialized in consumer psychology, in early investigation, was paying attention in this purchased behavior by comparing two distinct areas practices which are, customers culture and their economic organization development. Organization for Economic Cooperation and Development (OECD) countries. The corresponding figure shown, predictable almost ninety percent of customer decreased the purchased behavior for this appliance practices and intended with no towards purchased energy

efficient appliances in non-OECD by interval years between 2010–2040 (Eia, 2017; EIA, 2013). Meanwhile in increase the competition demanding, heterogeneous products shift towards more homogeneous product for peoples and present standard which make the homogeneous product less than heterogeneous. (Zhao et al, 2011:Ma et al., 2013). Another possibility is that standards facilitate innovation of efficiency on energy saver by the manufacturer or companies.

Researcher presents an overview from the early literature for consumer's purchase of energy efficient appliances with factors in purchased intention toward energy efficient household appliances. Particular research concludes behaviors differences' initiate lower buying behavior among household members (Tan et al., 2017a; Wang et al., 2019) in purchased the energy efficient appliances and believing for the labels, the model concludes most of them highly motivated for choosing the energy-efficient labels. Consumer choices will shift towards these green appliances assisting with re-branding adjustable primary word at the frontier named "eco" which is intact with the word consumer friendlessness and standardized label (Wahid et al., 2011) can will increase the consumer intention in purchasing. Malaysian consumers' purchase of energy efficient appliances and towards reducing carbon footprint are differing within three group of ethic. Chinese and Indians or others ethnic share twenty-five percentage each and Malay play major ethnic as fifty percentages. In conclusion, regardless the races, consumer care only their health and environmental affect once they are having purchasing behavior especially in buying organic foods (Tan, 2017: Antunes et al, 2012; Wandel et. al., 1997).

3. Research Mapping

Practically, the current literature review was showing the direction to the future research in exploring possible product factors that relate with intention and purchased of energy efficiencies appliances in Malaysia. Figure 1 shown the proposed framework.

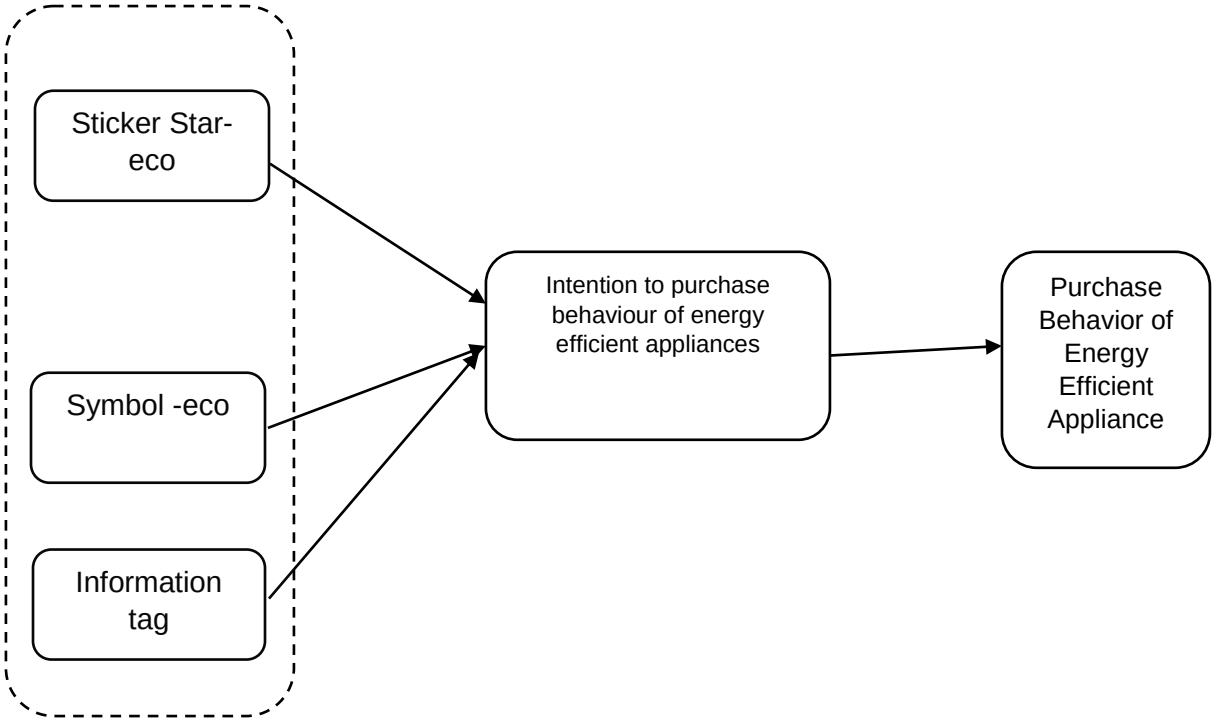

Figure 1: Proposed framework

4. Research Question

Energy efficient appliances study in Malaysia briefly explains in product consciousness, general perception toward energy consumption of appliances and limit to the scope of environmental issues only (Ahmad et al., 2012; Islam et al., 2019; Mahlia et al., 2005; Mustafa, Husain, Abd Aziz, et al., 2014; Sentosa, 2012; Tang, 2012). Since the study will adapt and adopt the TPB model and extend to certain exploratory factors in purchasing energy efficient appliances. The research questions of the study will have derived from the energy saving behavior scope, up to intention and purchasing the energy efficient appliances.

1. What is the impact of sticker star on consumer intention to purchase behaviour on energy efficient appliance?
2. What is the extent of product symbol benefit on consumer intention to purchase behaviour on energy efficient appliance?
3. What is the impact of product tagging on consumer intention to purchase behaviour on energy efficient appliance?

5. Research statement

Since the green purchased known to be one of the best solution for reducing the carbon dioxide gases (CO2) emission into the air. The green energy technology was applied for household appliances, many researches have been conducted and handful gathered information about this purchased behavior toward energy efficient appliances (Zhang et al., 2020a). Other familiar name for this behavior is “green appliances”, “electrical energy saver appliances” and “efficient saver appliances”. Since the green purchased known to be one of the best solution for reducing the carbon dioxide gases (CO2) emission into the air. The green energy technology was applied for household appliances, many researches have been conducted and handful gathered information about this purchased behavior toward energy efficient appliances (Zhang et al., 2020a). Other familiar name for this behavior is “green appliances”, “electrical energy saver appliances” and “efficient saver appliances”.

References

Ahmad, A. S., Hassan, M. Y., Abdullah, H., Rahman, H. A., Majid, M. S., & Bandi, M. (2012). Energy efficiency measurements in a Malaysian public university. *2012 IEEE International Conference on Power and Energy (PECon)*, 582–587.

Antunes, D., Gaspar, R., & Lino, J. (2012). Energy Efficient Appliances and Energy Efficient Behaviours: from consumer's assessment to behaviour intervention.

Islam, M. T., Huda, N., & Saidur, R. (2019). Current energy mix and techno-economic analysis of concentrating solar power (CSP) technologies in Malaysia. *Renewable Energy*, *140*, 789–806.

Mahlia, T. M. I., Masjuki, H. H., Taha, F. M., Rahim, N. A., & Saidur, R. (2005). Energy labeling for electric fans in Malaysia. *Energy Policy*, *33*(1), 63–68.

Mustafa, N. H., Husain, M. N., Abd Aziz, M. Z. A., Othman, M. A., & Malek, F. (2014). A survey on human behavior towards energy efficiency for office worker in malaysia. *Journal of Physics: Conference Series*, *495*(1), 12030.

Sentosa, I. (2012). *Examining a Theory of Planned Behavior (Tpb) and Technology Acceptance Model (Tam) in Internetpurchasing Using Structural Equation Modeling*. *2*(2), 62–77.

Tang, F. E. (2012). An energy consumption study for a Malaysian university. *World Academy of Science, Engineering and Technology*, *68*, 1757–1763.

Wilson, A., & Morrill, J. (1993). Consumer guide to home energy savings.

Zhang, Y., Bai, X., & Mills, F. P. (2020). Characterizing energy-related occupant behavior in residential buildings: Evidence from a survey in Beijing, China. *Energy and Buildings*, *214*. https://doi.org/10.1016/j.enbuild.2020.109823