

# Factors Analysis in Desire to Buy Environmental Friendly Products

## *Case Study for Air Condition Products*

Judianto Hasan<sup>1</sup>, Hartoyo<sup>2</sup>, Ujang Sumarwan<sup>2</sup> & Budi Suharjo<sup>3</sup>

<sup>1</sup> Doctoral Student Graduate Program of Management and Business, Bogor Agricultural University, Bogor, Indonesia

<sup>2</sup> Department of Family and Consumer Sciences, Graduate Program of Management and Business, Bogor Agricultural University, Bogor, Indonesia

<sup>3</sup> Department of Statistics, Graduate Program of Management and Business, Bogor Agricultural University, Bogor, Indonesia

Correspondence: Judianto Hasan, Business and Management Post Graduate Program IPB, Gedung MB IPB - Jl., Raya Pajajaran, Bogor 16151, Indonesia. Tel: 62-251-831-3813 & 62-811-840-335. E-mail: judianto.hasan@yahoo.com

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### **Abstract**

Obviously company must know how to cater to today's green consumers. This will lead to significant opportunities to grow the sales and increase market share. From literatures it is known there are factors which lead to consumer preference to environmental friendly products. Those factors are attributes, personal characteristics and external factors. In this study those factors are put into a model which lead to consumer desire to buy. The objectives are to analyze those factors which influence the desire to buy environmental friendly products with Structural Equation Modelling, and to examine AIDA model in relation to promote the desire to buy. This will get main factors for marketing strategy and program for environmental friendly products to Indonesian consumers. Since Indonesia as tropical country has seen its citizen to high usage of air condition, which have seen a growing yearly sales to over 10% nationwide. This product will be the focus of this study, with respondents taken from household in Jakarta provincial area. It was found that external factor have influenced the desire to buy environmental friendly Air Condition product, more compare to other factors in personal characteristics and product attributes.

**Keywords:** environmental friendly products, green consumers, green marketing, SEM

### **1. Introduction**

Green marketing for environmental friendly products (EFP) has been known to all of us in marketing discipline. This green marketing effort is become stronger in developed countries in the early 21st century (Ottman, Stafford & Hartmann, 2006) and the need to go green has been introduced to all over the world. The challenge ahead for a company to survive is to design products and services which is accepted as green products or EFP (Nidumolu, Prahalad & Rangaswami, 2009). There are many different EFP categories already in the market which include food products, cars, home appliances, electronics, and many others. The definition of EFP or green products are products that have less of an impact on the environment or are less detrimental to human health compare to ordinary products. This EFP might, typically, be formed or part-formed from recycled components, be manufactured in a more energy-conservative way, or can reduce energy consumption, and other feature which is accepted to be friendlier to the environment.

The development of EFP to tackle the issue on climate change and environment degradation through design and product innovation has become widely accepted. This also has been the attention from consumers, industries and government in many countries, because it is one way to make it a sustainable action in solving the environmental problems we are facing. Thus, the green market is not just here to stay, it will also grow and mature, evolving the rules of engagement even further. Knowing how best to cater to today's green consumers will bring significant opportunities to grow top-line sales and revenue growth and increase market share among the fast-growing numbers of green consumers, as well as to save money, enhance employee morale, and recruit and retain the brightest minds (Ottman, 2011). But not all EFP has its success in the market, some people still persist in using

the product as we can call it traditional or conventional products. Actually there are many ways to convert conventional products to be EFP in the same brand. This may include the change in raw materials, less packaging and more organic, more energy efficient, and many others.

As a developing country Indonesia has grown its economy with a growing demand for energy. It's policy on heavily subsidized electricity tariff has made Indonesia very inefficient for its energy utilization such as electricity. For the last five years there is strong pressure for the implementation of demand side management through the use of energy efficient equipment. The government is considering to slowly revoking the subsidy in the wake of strong international oil prices. Utilization of energy efficient equipment like Air Condition (AC) in millions of household in Indonesia will reduce not only the rate of growth for electricity subsidy, but also will reduce the growing demand for electricity generated from coal fired power plant from most of the island power generation which consequently reducing their CO<sub>2</sub> emission rate. Many NGO's, researchers and public officials have called people to engage in proenvironmental behaviours.

Environmental friendly products which include energy efficient products can be categorized as product innovation. It needs careful attention to many factors which influence and support its acceptances in marketplace i.e. the product attributes, personal characteristics of consumer, promotional effort, availability of environmental policy and many others. Government and private companies will need some guidance to promote the utilization of energy efficient household electronics and electrical appliances which in the case of Indonesia will produce less carbon for their need of energy. A successful utilization of energy efficient products as one of EFP, will need a suitable program and marketing strategy which influence the desire to buy. To support EFP success in Indonesian market, it is then required to know which factors we should take more attention, and how their relationship can be put in a model. The research also focus to AC which is the most electricity consuming appliances in many households in Indonesia.

Therefore research objectives are as follows :

- a) To analyze those factors which influence the desire to buy environmental friendly AC.
- b) To examine the hierarchy of effect model i.e. AIDA model in relation to promote the desire to buy environmental friendly AC.
- c) To analyze main factors for marketing strategy and program for environmental friendly products to Indonesian consumers.

## 2. Literature Review

Research about the identity and nature of the green consumer has been the central character in the development of green marketing, as businesses attempt to understand and respond to external pressures to improve their environmental performance. Marketing practitioners and academics are attempting to identify and understand green consumers and their needs, and to develop market offerings that meet these needs. (Peattie, 2001). Some studies have tried to explore demographic, socio-demographic and psychographic to define green market-segments. For example age has been explored by many researchers. Where the earlier research found that green consumer were younger than average (Van Liere & Dunlap, 1981). More research for example by Samdahl and Robertson (1989), Vining and Ebreo (1990) and Roberts (1996) found that the green consumer as being older than average.

Some researchers found that women are more likely to present pro environmental behaviour for example in research from Mainieri, Barnett, Valdero, Unipan and Oskamp (1997). Also it is generally believed that income is positively correlated with environmental sensitivity. Because people with higher income level can pay more to have EFP compare to lesser income. But a research by Samdahl and Robertson (1989) found that environmentally aware consumers had a lower educational level and lower income than the average. The conclusion was income and educational level were not very reliable variables for predicting environmental concern or buying behaviour.

It is believed that socio demographics predictors are still controversial (Roberts, 1996; Kilbourne & Beckman, 1998). But, they still have some support in the sense that they still exert some influence (Laroche, Bergeron & Barbaro, 2001). Results also indicated that socio-demographics have their explanatory power is weak. Thus, there is little doubt that it has limited utility in the use of socio-demographic characteristics for profiling environmentally conscious consumers (Dimantopoulos, Schlegelmilch, Sinkovics & Bohlen, 2003).

Besides these studies on green market segmentation, another significant number of research papers seek to apply cognitive models in order to predict green consumer behaviour. But it has also produced weak relationships (Mainieri *et al.*, 1997). Several studies have investigated the relationship between attitudes towards the environment and the buying of EFP. The studies undertaken by Homer and Kahle (1988) and McCarty and

Shrum (1994) helped to clarify the interrelationship between values, attitudes and environmental behaviour. They have provided the empirical support for the hierarchical effect of the 'value-attitude-behaviour' model. Research has shown that environmental concern is related, but not highly correlated, with consumer behaviour. Also there is a gap found between attitude and behaviour (Baker & Ozaki, 2008). Study by Mintel (2006) also found that despite pro-environmental attitudes, and willingness to pay more for environmentally-friendly products, few consumers translated these attitudes into regular green buying behaviour. These inconclusive results therefore put the challenge for researchers and green marketers who try to correctly identify the green consumer segment.

The recent survey from Catalyze Communications (Greendonesia Report 2011) has concluded that Indonesian consumer has now spend their money with more cautious toward what they buy. They would like to see their products are less harmful effect towards the environment and also would like to see the producer has their responsibility to the environment. So it will need a good strategy and program to make EFP more successful in Indonesia. Some researchers have indicated many other factors which make EFP are chosen compare to its conventional products (Straughan & Roberts, 1999; Laroche *et al.*, 2001; Kim, 2002 ). So, finding those factors is quite essential for a good marketing strategy and program in Indonesia.

The widely-used model in marketing that attempts to explain consumer decision making process is called the *hierarchy of effects model*. Literature reviews reveal there is not one but many hierarchy of effects models. Although there are slightly different models, but basically this model propose there is a sequence of psychological stages before purchasing a product by the people. One quite popular model is commonly known with the acronym AIDA, standing for awareness-interest-desire-action. Its popularity still remains until now, although it has been introduced since 1920's. It is one of the many models of marketing communications based on a hierarchy of effects, because it is assumed that learning about a product will lead to feelings about the product that result in the purchase of the product. Previous research revealed that desire for action is the best predicting factor for behavioral changes between attention and interest for action (Bahram, Shaemi & Jolodar, 2011). AIDA model has also widely accepted as an adoption decision model (Engel, Blackwell & Miniard, 1995).

### 3. Research Methods

#### 3.1 Sample

There were 403 respondents agreed to participate in the study from Jakarta Provincial area and randomly selected using Multistage Random Sampling method. Jakarta was chosen because of the availability of information on EFP and easy access to electricity compare to other cities especially outside Java Island. Some brief explanation was given to the respondent about purpose of the research. Interview was held using a prepared questioner.

#### 3.2 Data Collection

For data collection survey Interviews were hold in June 2011. A set of questionnaire was prepared, which consists of two sections. The first part records the respondents' demographic data and the second part contains 3 sections. Section 1, consist of 7 questions on awareness, 10 questions on interest and 9 questions on respondent desire to buy and utilize environmental friendly AC. Section 2 consist questions related to personal characteristics of respondent. Section 3 consists of questions regarding the external factors that might affect their decision to buy and utilize EFP (Air condition energy efficient product). Section 4 consists of questions related to perceived attributes (Rogers, 2003). There are 4 questions related to relative advantage, 3 questions on product complexity, 2 questions each for product compatibility, trialability and observeability. The scales used to measure those dimensions were Likert scales (1 = strongly disagree and 5 = strongly agree).

#### 3.3 Analysis

Structural Equation Modelling (SEM) was selected because some of the factors influencing the desire to buy EFP cannot be directly observed, but can be considered latent variables. Also SEM would allow analyzing simultaneously the relationship between dependent and independent variables in the model (Hair, Anderson, Tatham & Black, 1998). The software used was LISREL 8.5.1. SEM was employed also for *Confirmatory Factor Analysis* (CFA).

### 4. Results and Discussion

#### 4.1 Demographic Profile

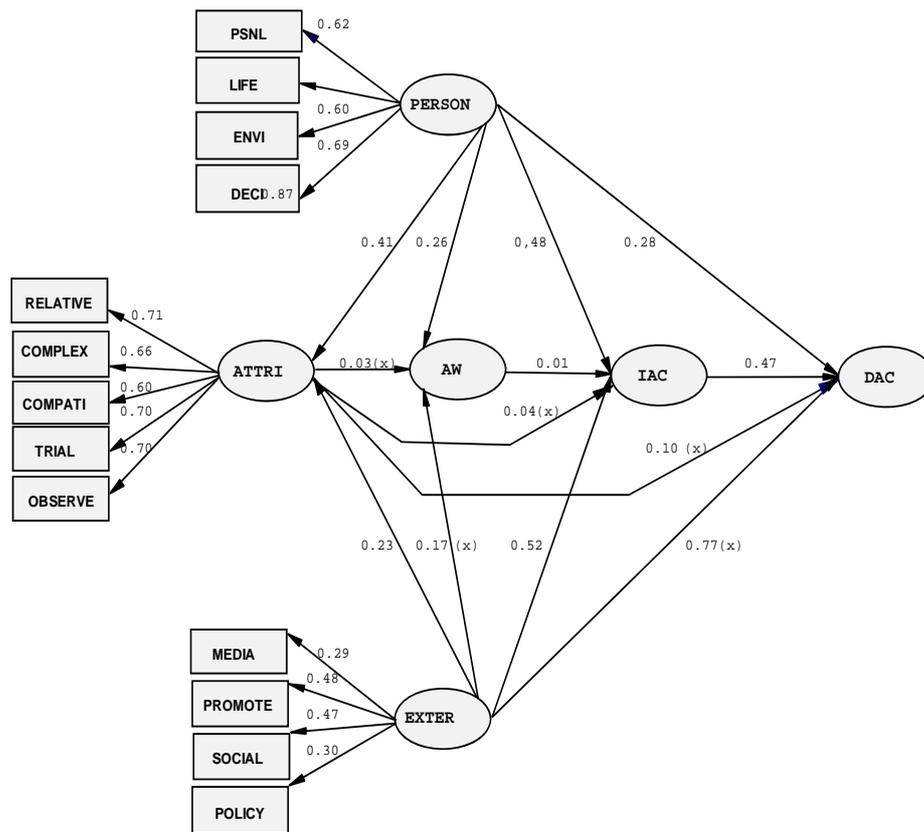
Sixty two percent of the respondents were female, and the average age of the respondents was 37 years. About seventy two percent of respondents have their family monthly expenditure about Rp. 3,500,000 per month (about US \$ 350), and only five percent has their monthly expenditure over Rp. 5,000,000. Only twenty one point four

percent of the respondent has college degree or better, and sixty point seven percent has been graduated from high school only. Forty percent of respondent has their occupation as housewives, which is quite common in Indonesia if the survey is carried out to household. While the remaining respondent work as clerk or running informal business.

4.2 Desire to Buy Environmental Friendly Products Model

To show the relationship among variables, a model was developed. The model utilized reference from Rogers (2003), AIDA model, and literatures namely from Laroche *et al.* (2001) and Schlegelmich *et al.* (1996). Those variables analyzed were Perceived Attributes (ATTRI), External Factors (EXTER), Personal Characteristics (PERSON), Awareness (AW), Interest (IAC) and Desire (DAC).

Perceived attributes variables measure the relative advantage (RELATIV), Complexity (COMPLEX), Compatibility (COMPATI), Trialability (TRIAL) and Observeability (OBSERV). External factors variables measure the Media utilization (MEDIA), Change agent promotion (PROMOTE), Social Interaction (SOCIAL), and Environmental policy (POLICY). Personal Characteristics variables measure Personality (PSNL), Life Style (LIFE), Environmental Knowledge (ENVI) and Decision making pattern (DECI). Also presented the standardized parameter estimates for the structural model, and the t-test result in Tables. Standardized structural coefficients estimates are used to compare the relative importance of the independent variables. The results indicate that not all the t-values for the standardized coefficients are above the 1.96 threshold. Those with (x) after the coefficients with t-values are not meeting this criteria.



Chi-Square=579.43, df=90, P-value=0.00000, RMSEA=0.013

Figure 1. Estimated Model Desire for Environmental Friendly Products (AC) in Indonesia

Model was tested for its goodness of fit using two statistical tests which are Chi-square ( $\chi^2$ ) dan and Root Mean Square Error of Approximation (RMSEA). Model is acceptable if P-Value (from  $\chi^2$  test) at least over 0.05 or RSMEA value is less than 0.08. Statistical analysis resulted P-Value = 0.000 and RMSEA = 0.013. So, overall the empirical model was accepted as meeting the criteria required (Hair *et al.*, 1998).

### 4.3 Perceived Attributes

An innovation is an idea, practice or object that is perceived as new by an individual or other unit of adoption. How the adopter perceived characteristics of the innovation has impacts on the process of adoption. The elements of the theory in Rogers (2003) relate to how an innovation is perceived based on its relative advantage, compatibility, complexity, trialability, and observability. The relative advantage of a product innovation, are not those dictated by the producers, but those as perceived by the individual. This attribute can be measured in economic terms, social prestige, convenience, satisfaction. Relative advantage from environmental friendly AC should relate to how much the customer or user could save from savings in energy (electricity) bill, or it could also give social prestige in the eyes of their peer or relatives. Compatibility as the degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of potential adopters. This means that past values for AC that is bigger and a mean to show the wealth of user should than be replaced by more functional values. Complexity of an innovation shows its ease or difficulty of use, being classified on the complexity-simplicity continuum. An important characteristic of an innovation is the ability of end users to experiment with it, or use it on a trial basis (Rogers, 2003). A trial period for an innovation helps potential adopters answer their own questions about how an innovation might work in their particular situation (trialability). The element of an innovation to which the results of an innovation are visible to others (observeability) is the fifth attribute.

Table 1. T-test result for Perceived Attributes (ATTRI)

No	FACTORS	Coeff	t value	Result*
1	Relative Advantage (RELATIVE)	0.71	10.50	Significant
2	Complexity (COMPLEX)	0.66	12.36	Significant
3	Compatibility (COMPATI)	0.60	10.68	Significant
4	Triability (TRIAL)	0.70	11.10	Significant
5	Observeability (OBSERVE)	0.70	12.09	Significant

Note: \* = t-test of significance result at  $\alpha = 0.05$  where t value above 1.96 is considered statistically significant.

In this study the model was tested by using AC for response on EFP available in Indonesian market. From figure shown, it can be seen that relative advantage (RELATIVE) has a coefficient of 0.71 and this is highest among other factor. All other factor are all significant where result from t-test of significance showed all five factors statistically significant for influencing perceived attribute of EFP. As many Indonesian are using AC at home in the office, the economic benefit from saving in electricity cost will be expected to be achieved immediately in daily operation. This is could be the best reason the relative advantage to be seen as more important compare to other attributes.

### 4.4 External Factors

There are external factors that will influence consumer desire to buy or adopt EFP. In fig. 1 it is shown that promotion effort of change agent (PROMO) and social interaction (SOCIAL) are two of the most important to contribute in external factors. Their coefficient are 0.48 and 0.47 respectively. One important factor in change agent success is the amount of effort spent in communication activities with clients (Rogers, 2003), this will increase interest (IAC) and desire (DAC) of environmental friendly AC.

Table 2. T-test results for External Factors (EXTER)

No	FACTORS	Coeff	t value	Result*
1	Media Selection (MEDIA)	0.29	8.74	Significant
2	Change Agent Promotion (PROMOTE)	0.48	13.09	Significant
3	Social Interaction (SOCIAL)	0.47	8.98	Significant
4	Decision Making (POLICY)	0.30	5.48	Significant

Note: \* = t-test of significance result at  $\alpha = 0.05$  where t value above 1.96 is considered statistically significant.

Social Interaction is reciprocal relationship which can influence each other between consumers, information will also flow through this method. Environmental policy (POLICY) from the authorities will affect the consumers, through its program which affect the daily life. Environmental policy (POLICY) has its influence on external factors affecting mainly on interest and desire, although this is lower compare to other factors. Also media selection (MEDIA) for conveying message on green products utilization will influence the rate of adoption (Rogers, 2003).

This result shows that effort from change agent with good communication using advertising media will bring success to increase desire to buy EFP (DESIRE). Change agent promotion will be needed mainly during the early stage of knowledge stage (Rogers, 2003).

#### 4.5 Personal Characteristics

Purchase decisions vary between individuals because of unique characteristics possessed by each individual. In this research personal characteristic factors were analyzed, which include Lifestyle (LIFE), Personality (PSNL), Decision making process (DECI), and environmental knowledge (ENVI). Lifestyle is a popular concept for understanding consumer behaviour, perhaps because it is more contemporary than personality and more comprehensive than values (Engel *et al.*, 1995).

Table 3. T-test results for Personal Characteristics

No	FACTORS	Coeff	t value	Result*
1	Personality (PSNL)	0.62	13.39	Significant
2	Lifestyle (LIFE)	0.87	21.44	Significant
3	Environmental Knowledge (ENVI)	0.60	12.87	Significant
4	Decision Making (DECI)	0.69	15.45	Significant

Note: \* = t-test of significance result at  $\alpha = 0.05$  where t value above 1.96 is considered statistically significant.

Although life style and personality construct have been quite popular in many consumer research, it was in the 1960s that the concept of lifestyle first began to be used more frequently by marketing managers in research undertaken into the phenomena of buying and consumption. In green marketing the research from Laroche *et al.* (2001), Straughan and Roberts (1999), have tried to explain this factor. Also many researches on personal characteristics affect intention and behaviours to buy green products were conducted such as from Schlegelmich *et al.* (2001) and Kim (2002). Also many other researchers have tried to identify psychographic correlates of green attitudes and behaviours. The result showed that they do provide some interesting insights into the nature of the green consumer (Straughan & Roberts, 1999).

In Figure 1 it is shown personal characteristic (PERSON) was affected by lifestyle (LIFE) with coefficient at 0.87. While decision making (DECI) coefficient is 0.69; personality (PSNL) 0.62 and environmental knowledge (ENVI) 0.60. All t-test of significance resulted all factors were significant well over 1.96 for  $\alpha = 0.05$ . This result shows consistency in many studies in which lifestyles were found to be excellent predictors.

#### 4.6 Awareness, Interest and Desire Model

Coefficient from personal characteristics (PERSON) to awareness (AW) was the only factor variable significant. It can be seen result from t-test, all other variables i.e. ATTRI and EXTER were not significant. Meanwhile Interest (IAC) was more affected by external factors (EXTER) with coefficient of 0.52. Although personal characteristics (PERSON) has a coefficient little bit lower than that, which is at 0.48. Perceived Attributes (ATTRI) were not significant. Desire (DAC) was also affected more by interest (IAC) with coefficient at 0.47, while coefficient for external factors (EXTER) was 0.77 its t values was less than 1.96. Perceived Attributes (ATTRI) was not statistically significant in affecting Interest (IAC) and Desire (DAC).

Table 4. T-test results for Estimated Model

No	Path	Coeff	t value	Result*
1	PERSON → ATTRI	0.41	7.81	Significant
2	PERSON → AW	0.26	3.54	Significant
3	PERSON → IAC	0.48	3.70	Significant
4	PERSON → DAC	0.28	2.00	Significant
5	ATTRI → AW	0.03 (x)	0.98	Not sig.
6	ATTRI → IAC	0.04 (x)	1.09	Not sig.
7	ATTRI → DAC	0.10 (x)	0.93	Not sig.
9	EXTER → ATTRI	0.23	2.86	Significant
10	EXTER → AW	0.17 (x)	0.82	Not sig.
11	EXTER → IAC	0.52	4.97	Significant
12	EXTER → DAC	0.77 (x)	0.27	Not sig.
13	AW → IAC	0.01	2.53	Significant
14	IAC → DAC	0.47	2.92	Significant

Note: \* = t test of significance result at  $\alpha = 0.05$  where t value above 1.96 is considered statistically significant. (x) = Not statistically significant result.

Personal characteristics (PERSON) and external factors (EXTER) are more influential in consumer interest, but in the case of desire towards environmental friendly AC (DAC) consumers are going more through interest stage before they reach their desire stage. Personal characteristics can have a direct influence to the consumer interest and desire. This result has shown stages in Awareness Interest and Desire in estimated model can be significantly affected by some of the factors. Where it shows also which dominant factors affect each stages.

#### *4.7 Managerial Implications*

Companies and government can find another way to look at the motivation for environmental behaviour patterns, centred on the individual cost-benefit analysis inherent in human decision-making. As behavioural choices imply costs but can deliver benefits, the consumer will behave in an environmentally sound manner if to do so seems likely to deliver sufficient benefit to make up for the higher price of green products, or the inconveniences involved in recycling or saving energy (Hartmann & Ibanez, 2006). In that case consumer will compare EFP attributes with conventional one. To make it easier for customer in recognising EFP it is then advisable to implement environmental labelling. This may relate to specific product categories, such as energy efficient equipments, in this case air condition. Products with well known brand are more advisable to use this labelling scheme. Because green brands can evoke positive emotions in certain target groups by simply offering information on environmentally sound product attributes. Knowing that a brand is green will always make some consumers feel better while using it. This can be achieved by adding its attribute with relative advantage in energy efficiency, utilization of materials that safe to environment, and recyclable. Company need to innovate the environmental friendly product attributes suitable for their products in the competitive market place.

Companies can improve the trust to them and strengthen the bond to their and future customer by throwing a consistent joint action to hold the constant environmental degradation and improve the situation in daily life. This can start from tree planting days, and support to wild life or back to nature program. To do so companies must engage change agents who can work closely with them. This change agent should have their own effort from their daily activities. He or she can come from different background and can be a celebrity in national level.

Personal characteristics like the lifestyle of consumer has influenced the awareness interest and desire towards EFP, so marketing communication to the right target where innovation in EFP is fit with the consumer expected lifestyle. Since the growing of middle class in Indonesia Government can also support the green lifestyle to middleclass which need energy efficient AC and EFP to support their daily life. Millions of household will benefit from energy efficient equipments and appliances to reduce their electricity cost. Government need to support this action because the reducing energy used in household sector will make government budget not to suffer again from heavy subsidy. Above the line programs using advertisement should be placed in many media to inform them about the benefit of being energy efficient, not only for themselves, but also to the country and to the world.

Green lifestyles can benefit consumer, but to shape this companies need to develop as specific program to the right target. It is on the consumer mind to decide and choose what is available in the market and make the best to change their world to more environmental friendly. Choosing the real EFP is now becoming easier although some claims might be false.

Environmental friendly products innovation will support the differentiation strategy. But it is necessary to make the customer agree to the green claim and to what extent the impact of the products they buy to their environment. A labelling scheme that is accepted nationwide can be introduced and promoted into Indonesian market.

#### **5. Conclusion**

This research has analysed the influence of factors attributable to desire toward EFP. It is found that the external and personal characteristic factors have their role in affecting the consumer readiness toward marketing communication and develop the awareness, interest and desire. Effort from change agent will also determine the success to build desire to buy EFP. Meanwhile companies and also government must put attention to shape lifestyle of consumers. Introducing new lifestyle related with environmental friendliness and energy conscious will help. Closest fit will determine the success of environmental friendly AC and other EFP.

The model developed using hierarchy of effect from AIDA model has shown the small effect from the perceived attributes. But the effect from other factors might need further research. The challenge for green marketers has so far been to increase the perception of individual benefits by adding emotional value to green brands, and will be even more so in the future.

Marketers must allow innovation in EFP to be introduced into the market with good marketing communication strategy and positioned the product as the green alternative to conventional products in the same product category and brand.

The limitations from this research include the cross-sectional nature of the study and the sample used. Many reports the difficulties to infer from a single study especially in green marketing issues. Samples taken from capital city of Indonesia may represent the urban households only, it may not represent those towns and rural households in other parts of Indonesia with difficulties in finding EFP suitable to their daily activities.

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