Jurnal Pengurusan 41(2014) 123 - 131

Perceptions on Renewable Energy Use in Malaysia: Mediating Role of Attitude

(Persepsi Penggunaan Tenaga Keterbaharuan di Malaysia: Sikap Sebagai Peranan Pengantara)

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ABSTRACT

This study investigates the perception towards renewable energy use in Malaysia. A survey of in the Klang-valley area yield responses from 200 respondents. Then, the data were analysed using exploratory factor analysis and multiple regression analysis. Five factors emerge from the factor analysis namely relative advantage, perceived behavioural control, ease of use, awareness, and benefit-cost trade-off. Multiple regression analysis is conducted to examine the explanatory power of these five factors in predicting the intention to use renewable energy. Results of the analysis show that 1) relative advantage and perceived behavioural controls positively mediate attitude towards renewable energy and 2) attitude positively mediates intention to use renewable energy. However, ease of use, benefit-cost trade-off and awareness positively but directly influence intention to use renewable energy. In conclusion, this study contributes to the literatures on social barriers to renewable energy in emerging nations and on theory of planned behaviour.

Keywords: Renewable energy; alternative energy; attitude; theory of planned behaviour

ABSTRAK

Kajian ini menyiasat persepsi responden terhadap penggunaan tenaga terbaharuan di Malaysia. Satu kaji selidik yang dijalankan di Lembah Kelang telah memperoleh maklum balas daripada 200 responden. Data seterusnya dianalisis menggunakan kaedah tinjauan analisis faktor dan analisis regresi pelbagai. Lima faktor muncul daripada analisis faktor iaitu kelebihan relatif, kawalan perilaku tanggapan, penggunaan mudah, kesedaran, dan tukaran manfaat-kos. Analisis regresi pelbagai dilakukan untuk menilai kuasa tinjauan terhadap kelima-lima faktor di samping meramal niat penggunaan tenaga terbaharuan. Analisis menunjukkan 1) kelebihan relatif dan kawalan perilaku tanggapan berfungsi sebagai pengantara yang secara positif mempengaruhi kesan sikap terhadap tenaga terbaharuan, manakala 2) sikap berfungsi sebagai pengantara yang secara positif mempengrauhi niat untuk mengguna tenaga terbaharuan. Sementara itu, penggunaan mudah, kesedaran dan tukaran manfaat-kos secara positif dan langsung mempengaruhi niat menggunakan tenaga terbaharuan. Kesimpulannya, kajian ini menyumbang kepada literatur mengenai halangan sosial terhadap tenaga terbaharuan dalam kalangan negara-negara baru muncul dan kepada teori kelakuan terancang.

Kata kunci: Tenaga terbaharuan; tenaga alternatif; sikap; teori kelakuan terancang

INTRODUCTION

Higher dependency of the use of fossil fuel has contributed to increasing global warming. From the standpoint of alternative energy solution, one of the regular ways to solve the global warming problem is to invest in and increase the use of renewable energy among mass users (Miller & Serchuk 1996). Data from department of statistics Malaysia (Table 1) shows that around thirty per cent of Malaysia's export and fifteen per cent of Malaysia's import involve non-edible and petroleum oil to provide energy solution. However, attempt to convert to renewable energy has been very slow worldwide (Fredric 2005). Renewable energy initiative or REN21 (2011) reports that the initiative of country-wide investment in renewable energy is limited only among top five countries in the world. A presentation (Figure 1 and Figure 2) from Energy Commission Malaysia (Ahmad Fauzi 2009) reveals a startling picture depicting Malaysia's growing need for very limited renewable energy initiatives. A growing body of studies on alternative energy criticises limited information on the customers' attitude towards renewable energy as one of the reasons for not having successful penetration among the users.

An important body of literatures examines various factors influencing customers' intention to use renewable energy. The literature from Western contexts investigate how various social, political and financial issues turn into expensive choices for the users of renewable energy (Faiers & Neame 2006; Komendantova, Patt, Barras & Battaglini 2012; Mallett 2007; Richards, Noble & Belcher 2012; Stephenson & Loannou 2010; Wüstenhagen, Wolsink & Bürer 2007). Studies on social acceptance of renewable energy in Malaysia involve technical

TABLE 1. Selected economic indicators of Malaysia

Indicators	2008	2009	2010
GDP at current prices (RM million)	742,470	679,938	765,965
GDP Growth (%)	4.8	(1.6)	7.2
Import (total import as a percentage of GDP)	70%	64%	69%
1. Crude Materials, Inedible (% of total import)	4%	3%	4%
2. Mineral Fuels, Lubricants, and Other (% of total import)	11%	8%	10%
3. Oils & Animal and Vegetable fats (% of total import)	1%	1%	1%
Total (sum of % 1-3)	16%	13%	15%
Export (total export as a percentage of GDP)	89%	81%	83%
1. Crude Materials, Inedible (% of total export)	3%	2%	3%
2. Mineral Fuels, Lubricants, and Other (% of total export)	18%	14%	16%
3. Oils & Animal and Vegetable fats (% of total export)	9%	8%	8%
Total (sum of % of 1-3)	30%	25%	27%

Source: Department of Statistics Malaysia (Malaysia at a glance), visited on March 2012

and regulatory features of various energy sources (i.e. solar, biomass etc.) (Chua & Oh 2012; Mekhilef, Safari, Mustaffa, Saidur, Omar & Younis 2012; Sovacool & Bulan 2012). As the demand for energy in emerging nations is increasing tremendously, it is of immense importance to understand the users' attitude towards and intention to use renewable energy.

Cost reduction, users' life standard, location of the users' establishment and users' knowledge gap emerge as significant determinants of the users' intention to use renewable energy (Faiers & Neame 2006; Zografakis, Sifaki, Pagalou, Nikitaki, Psarakis & Tsagarakis 2010). Most of these factors are examined based on post-purchase behaviour of the users of renewable energy (Leucht, Kölbel, Laborgne & Khomenko 2010; Rogers, Simmons, Convery & Weatherall 2008; Rogers, Simmons, Convery & Weatherall 2011). Moreover, the pre-purchase users' intention primarily concentrates predominantly towards willingness-to-pay syndrome (Zografakis et al. 2010). Majority of the studies have reported using innovation diffusion theory by Rogers (1962), which considers adoption to renewable energy technology continuing procedure. However, it is yet to fully uncover the theoretical basis of pre-purchase decision making in renewable energy (Mallett 2007). This study combines theories from the core of pre-purchase intention, underlying reasons behind any decision and adoption to new technology. This study intends to identify the factors influencing the intention to use renewable energy in Malaysia.

LITERATURE REVIEW

Renewable energy is the transformation of natural energy with the help of advanced technology to replace conventional energy solutions to reduce the global warming problems. Last two decades, from 1990 to 2010, witness a number of studies that have been conducted to identify factors influencing attitude of the potential users' towards renewable energy in different Western countries. These factors can be classified into three major groups: social, political/regulatory, and technical (Wüstenhagen et al. 2007). However, Fredric (2005) and Jacobsson and Johnson (2000) argue that social awareness and lack of understanding of the choice of the end users are among the important reasons behind the slow growth of renewable energy revolution in many countries. Extant studies have investigated two dimensions of theories while looking into factors influencing the attitude of the end users: the pre-purchase and the post-use behaviour (See Jayaraman, Haron, Sung & Lin 2011). Since it is important for various emerging nations to understand the transmission process from conventional to renewable energy, this study reviews factors and theories relevant to pre-purchase attitude towards renewable energy use.

What are the usual suspects while investigating end users' purchase intention of the new technology? Two groups of theories are highly cited in this regard. Theory of reasoned action (TRA) and theory of planned behaviour (TPB) in one group, and technology adoption model (TAM) in another group. Fishbein and Ajzen (1975) and Ajzen (1991, 2002) provide framework for systematic purchase decision process using TRA and TPB, respectively. These two theories explain norms and behavioural control of the users into action. Technology Adoption Model by Davis, Bagozzi and Warshaw (1989) is extended from the theory of reasoned (TRA) action. However, TAM puts aside the influence of norms. Technology adoption model puts forward more extrinsic variables based on perceived usefulness and perceived ease of use influencing attitude towards any product. TRA and TPB combine extrinsic and intrinsic variables that involve subjective norms alongside attitude towards behaviour as determinants of behavioural intention. Two major differences between these two groups of theories are attitude being a mediator in technology adoption model and normative belief and

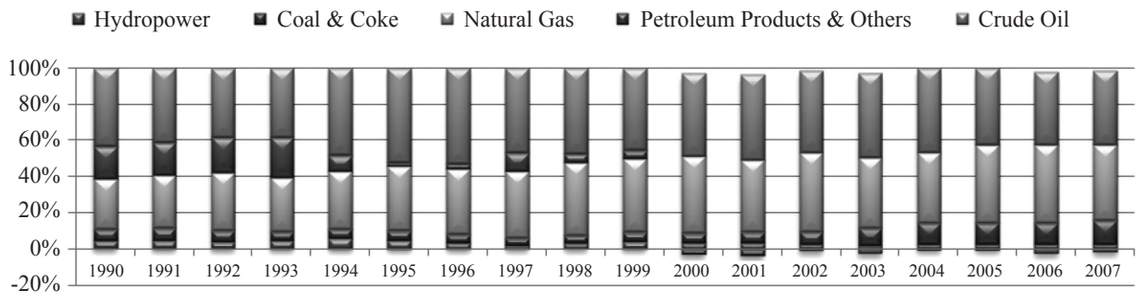

FIGURE 1. Commercial energy supply in Malaysia

Source: Energy Commission Malaysia (Ahmad Fauzi 2009)

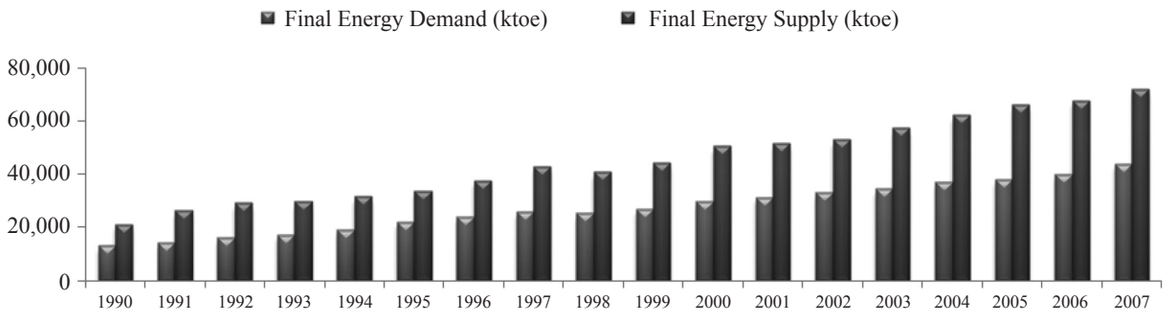

FIGURE 2. Primary energy supply and demand in Malaysia

Source: Energy Commission Malaysia (Ahmad Fauzi 2009)

perceived users' behavioural control becoming separate determinants in theory of reasoned actions and theory of planned behaviour (see Malhotra & Galletta 1999 and references therein).

Attitude towards renewable energy can be defined as the perception of the potential users', their belief about the benefits and drawbacks of the new technology and about their intention to buy the technology. Renewable energy is expensive. However, the benefits are enduring as well. Hence, the potential users must have correct information and adequate level of awareness to make the best trade-off between the benefits and drawbacks of the renewable technology. Renewable technology awareness is a concept where potential users' can collect or have access to necessary information about the basic use, financial prospects and environmental impact of renewable energy (Sidiras & Koukios 2004). A higher level of awareness enables the users to make informed decision and it also increases the level of acceptance among new users (Mirza, Ahmad, Harijan & Majeed 2009). To make information cheap and accessible by mass users, government can undertake extensive marketing plans (Angeliki 2012). Large scale training and community awareness programs can be carried out to facilitate an easy transition from conventional to renewable energy solutions (Gossling, Kunkel, Schumacher, Heck, Birkemeyer, Froese, Naber & Schliermann 2005).

H_1 A higher level of technology awareness has a positive relationship with users' intention to use renewable energy.

After analysing the preliminary information on renewable energy information, users' collect information on cost of installation, new machines, and maintenance. The higher is the benefit-cost ratio, the more positive is the intention to switch to renewable energy. Minimum investment required to install renewable energy can be higher. Rogers et al. (2011) and West et al. (2010) suggest availing economic incentive to ease the financial burden from the users. However, there are studies on willingness to pay while using renewable energy as an alternative energy, that reported negative opinion from the users' in Australia, United Kingdom, Greece and China (Dalton, Lockington & Baldock 2008; Faiers & Neame 2006; Zhu, Zhang, Du, Zhou, Qiu & Li 2011; Zografakis et al. 2010). The summary of these studies indicates that on the average the users are reluctant to pay more than 5-percent as additional cost for renewable energy usage compared to the cost they are paying now. This negative attitude may reduce users' intention to switch to renewable energy.

H_2 Higher benefit-cost ratio positively correlates with intention to use renewable energy.

Preliminary analysis on cost and investment drive the potential users towards strong intention to purchase the renewable energy technology. However, users extend the analysis to understand whether they have full control over their decision, a choice of technology based on ease of use and perceived usefulness. Theory of planned behaviour (Ajzen 2002) explains perceived behavioural control of the users' while analysing the extent to which

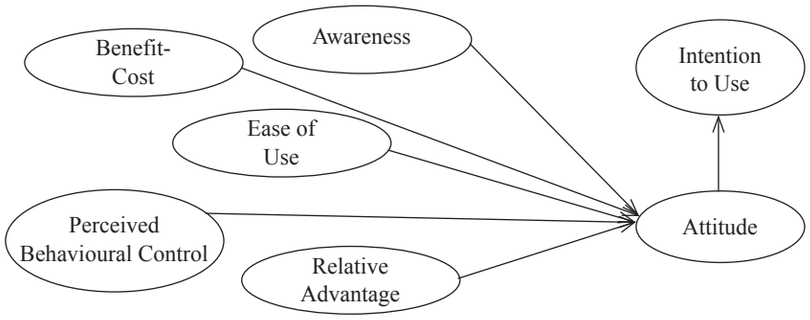

FIGURE 3. Conceptual framework

they control the decision regarding the purchase of the new technology. Users' confidence in and reliability with the decision under environmental constrains and positive approach towards future use represent higher perceived behavioural control (Brohmann, Feenstra, Heiskanen, Hodson, Mourik, Prasad & Raven 2007; Cass & Walker 2009). Hence, it is also clear that perceived behavioural control cannot influence the intention of renewable energy use directly. Attitude mediates the link between perceived behavioural control and intention to use renewable energy. Marketing programs on renewable technology should highlight the lifestyle of the users and these programs should target actual purchaser (West et al. 2010; Wiser & Pickle 1997).

H_3 Stronger perceived behavioural control positively influences attitude towards renewable energy and indirectly influences intention to use renewable energy.

Technology adoption model (Davis et al. 1989) supports that users accept a new technology based on their perceived ease of use. Perceived ease of use is influenced by users' opinion regarding installation, regular use, maintenance and recycling of the new technology. Ease of use is explained from the technical standpoint of renewable energy. Studies perceive that the use of solar energy and management of biomass spell out numerous technical barriers to end users (Haidar, John & Shawal 2011; Komendantova et al. 2012; Mallett 2007). As a result, mass users show disinclination to invest in solar and biomass energy. If the government would like to distribute energy produced from renewable sources, government would have to open retail store and distribution system to sell solar panels and other accessories. Stephenson and Loannou (2010) argue that family and community friendly renewable technology will positively influence the intention to use renewable energy.

H_4 Higher perceived ease of use positively influences the intention to use renewable energy.

Finally, users compare the existing renewable energy technology with the conventional technologies and make decisions based on an overall socio-economical view point (Silva 2008). Users search for the energy technology that is relatively cheaper, easy to use and offer benefits in the future. Growth of renewable energy usage has been much slower than expected due to less relative advantages of the new technology compared to easy to use and easy to manage energy solutions (Stephenson & Loannou 2010). Relative advantage of a new technology includes cost, social impact as well aesthetics and other behavioural factors (Dalton et al. 2008). Relative advantage is ensured if the new technology offers a higher value, is designed based on local taste, and offers a replacement benefit if the users want to go back to earlier technology (Brohmann et al. 2007; Mallett 2007; Silva 2008). However, relative advantage is influenced by individual attitude. Hence, relative advantage is hypothesised to mediate attitude towards renewable energy and has an indirect relationship with intention to use renewable energy.

H_5 Higher relative advantage of renewable energy directly positively influences attitude towards renewable energy and indirectly influences users' intention to use renewable energy.

Technology acceptance model identifies attitude towards using (ATU) as a mediator between behavioural intention to buy, and perceived ease of use and perceived usefulness. Theory of reasoned action puts attitude towards behaviour (ATB) as one of the first-stage mediators between beliefs and evaluations, and behavioural intention. This study considers the mediating role of attitude towards renewable energy use. Higher benefit-cost trade-off, higher level of awareness and higher ease of use directly influence intention to use renewable energy. Higher relative advantage and higher perceived behavioural control are hypothesised to directly influence intention to use renewable energy.

H_6 Attitude towards renewable energy directly mediates the relationship between intention to use and external determinant.

METHODOLOGY

The primary objective of this study is to analyse the most influential determinants of attitude of the Malaysian households' towards renewable energy use. Literature review and extensive brainstorming with industry experts have assisted in gathering the conceptual framework,

which lead to the eventual data collection. After a brief pre-testing involving twenty sample respondents, a structured questionnaire has been finalised for mass survey. Based on the conceptual framework, the questionnaire includes perception related questions that use 6-points response scale. In the scale, '1' is used when respondents strongly disagree with the statement while '6' is used for the other extreme. Hypotheses planned to be tested in this study involve constructs that should be tested using proxies. Hence, a number of statements are included in the questionnaire to analyse the constructs. A total of 27 such statements are given in the questionnaire for respondents' opinion.

Households' use of renewable energy is still in an emerging stage in Malaysia. Therefore, it is difficult to get any sampling profile. Consequently, the study follows a snow-ball sampling method. Under this method, researchers collect respondents' information from other respondents (Malhotra 2008). Since the study uses non-parametric sampling method, results of this study theoretically generalises the objectives among Malaysians (Calder, Phillips & Tybout 1983). Data collection continue until the researchers find a theoretical situation in respondents' opinion and demographic characteristics of the respondents come close to the official statistics in Malaysia. Table 2 shows demographic characteristics such as gender, ethnic and size of the establishment. Around 60 percent of the respondents are female, 73 percent of them are Malay ethnic and around 88 percent of them are having at most five rooms in their houses.

TABLE 2. Respondents' profile

Variables		Freq.	%
Gender	Male	81	40.5
	Female	119	59.5
Ethnic	Malay	146	73
	Chinese	27	13.5
	Indian	16	8
	Others	11	5.5
Establishment Size	Below 3 Rooms	63	31.5
	3-5 Rooms	114	57
	5-10 Rooms	17	8.5
	10-20 Rooms	1	0.5
	More Than 20 Rooms	1	0.5

Note: Missing values are ignored, N = 200

Data are analysed in three steps. Factor analysis is used to extract common theme from a number of statements (Sharma 1996). Principal component analysis is used alongside varimax rotation as the theoretical framework does not assume any co-relation among the constructs. Table 3 reports the rotated component matrix with minimum factor loading of 0.50. Sampling adequacy and reliability of the constructs are tested using Kaiser-Mayer-Olkin (KMO) statistics and Chronbach alpha. A minimum of 0.7 KMO statistics is expected to meet satisfactory sampling adequacy (Kaiser 1974). Nunnally (1978) supports a minimum alpha value of 0.70. Factor outputs are saved using Anderson-Rubin, which converts the outputs into a standardised normal distribution with mean equals zero and variance equals one.

Factor outputs from factor analysis are used to conduct multiple regression analysis following the theoretical framework depicted in Figure 3. Attitude towards renewable energy is the mediator. Thus, regression analysis must show the direct and indirect relationships as depicted in Figure 3. Relative advantage and perceived behavioural control have indicated effects on intention to use mediated by attitude towards renewable energy. Benefit-cost trade-off, awareness and ease of use show a direct effect on intention to use renewable energy. Baron and Kenny (1986) suggest a four-steps methodological solutions for testing a mediation. Let's consider these effects as paths. Path 'C' goes from determinant constructs to dependent constructs to intention to use. Path 'A' goes from determinants to mediator attitude towards renewable energy. Path 'B' goes from mediator to intention to use. According to Baron and Kenny (1986), analysis should follow paths 'C', 'A' and 'B.' If all these three relationships are significant, then one more step will be needed to conclude whether a mediation is possible or not. The last stage involves all the determinants and mediating variables to be used to regress against dependent variable. However, these famous four steps do not provide statistical significance to the indirect effect (MacKinnon, Fairchild & Fritz 2007).

Sobel (1982) presents a significance test for the indirect effect involving determinants, mediating variables and dependent variable. This approach is also called the Sobel product of coefficients approach. In this approach, $B_{indirect} = B_2 \times B$. Here, B_2 is the unstandardized beta coefficient of mediator with dependent variable when conducting regression involving all independent determinants, mediator and dependent variable. B is the unstandardized beta coefficient of independent variables predicting the mediator variable. After the result of Beta Indirect ($B_{indirect}$) is obtained, the significance of the beta is checked using online software. Sobel test statistics is $Z = \frac{ab}{\left(b^2 SE_a^2\right) + \left(a^2 SE_b^2\right)}$ and follows normal distribution. Here, 'a' represents coefficient for the relationship between the independent variables and the mediator, 'b' refers to coefficient for prediction using mediator and dependent variable. 'SEa' presents the standard error of the relationship between mediator and independent variables and 'SEb' shows the standard error of the relationship between dependent variable and mediator. Tables 4 and 5 show the results of multiple regression models and significance tests for indirect relationship.

TABLE 3. Factor analysis outputs

Factors	Statements/Variables	Loading	Var. Explained (%)	Cronbach Alpha	Mean
Ease of Use	Easy to install renewable energy materials	0.821	14.73	0.918	4.146
	Easily understandable manuals	0.801			
	Easy to operate	0.787			
	Easy to master on operating the machine	0.777			
Awareness	I can recall what is renewable energy	0.851	13.88	0.893	4.248
	I am aware of renewable energy	0.829			
	I can recognize renewable energy easily	0.786			
	Easy to imagine renewable energy	0.769			
Benefit-cost Trade-off	Additional cost required for training	0.867	11.21	0.902	4.34
	Difficult to justify cost and benefits	0.835			
	High set up cost	0.811			
Relative Advantage	Environmental concern has significant benefits.	0.798	20.79	0.927	4.609
	Environmental involvement matters.	0.794			
	Environmental involvement benefits me a lot.	0.737			
	RE will decrease air pollution	0.737			
	RE will reduce carbon footprint	0.697			
	RE will reduce conventional energy use	0.693			
	RE will offer competitive benefits to my country	0.613			
Perceived Behavioural Control	I will use RE even if RE is relatively expensive	0.771	15.23	0.91	4.49
	I will use RE even my friends advise me not to use.	0.751			
	I can difference by using RE	0.75			
	Using renewable energy is entirely within my control	0.691			
	I will buy RE very soon	0.594			
	I have the resources, knowledge and ability to use renewable energy	0.578			

Note: KMO = 0.918, Cumulative Variance Explained (%) = 75.84%,

DISCUSSION OF FINDINGS

Table 3 shows five factors with their respective factor loading, variance explained, mean and reliability statistics. The analyses reveal outstanding KMO statistics of 0.918 (Kaiser 1974), cumulative variance explained of 75.84 percent is median in management research (Field 2005; Sharma 1996). Relative advantage and perceived behavioural control collectively explained half of the total variance explained by all five factors. Two factors are the most important factors in terms of the mean values. Their mean values are 4.6 and 4.49 respectively. Cronbach alpha values of all the factors are way higher than the satisfactory limits (Nunnally 1978).

TABLE 4. Regression outputs

Factors	Model 1		Model 2		Model 3		Model 4		Model 5	
	Std Beta	Sig	Std Beta	Sig	Std Beta	Sig	Std Beta	Sig	Std Beta	Sig
Constant		0.974		0.820		0.491		0.917		0.470
Attitude	0.284	0.001	--	--	--	--	0.474	0.000	--	--
Rel. Adv.	0.023	0.724	0.136	0.026	0.397	0.000	--	--	0.418	0.000
PBC	0.168	0.006	0.264	0.000	0.335	0.000	--	--	0.346	0.000
Ease of Use	0.326	0.000	0.363	0.000	0.13	0.026	--	--	--	--
Awareness	0.187	0.002	0.203	0.001	0.057	0.350	--	--	--	--
Benefit-Cost	0.103	0.074	0.104	0.081	0.005	0.930	--	--	--	--
Adj. R^2	0.395		0.345		0.341		0.22		0.33	
F Value	22.662	0.000	21.966	0.000	21.613	0.000	57.287	0.000	50.01	0.000
Dependent Variable	Intention to use		Intention to use		Attitude		Intention to use		Attitude	

Note: Rel. Adv. = Relative Advantage; PBC = Perceived Behavioural Control; Std = Standardised

Table 4 shows the regression models with and without the mediating terms. It shows step-by-step whether mediation is possible or not. Five models are being tested. The most left column shows the factors, which include attitude (the mediator), two indirect factors (relative advantage and perceived behavioural control), and three direct factors (ease of use, awareness and benefit-cost trade-off). Model 1 includes all the determinant factors alongside the mediator and intention to use as the dependent variable. With a higher level of Adjusted R Squared, the model shows insignificant coefficient of relative advantage. However, the mediator (attitude) is significant at 1% level. Model 2 finds all the independent variables, except the mediator, are significant (at the maximum of 10% level of one variable).

Model 3 shows that two direct factors, awareness and benefit-cost trade-off, become insignificant when regressed with attitude (the mediator) as the dependent variable. Ease of use is consistently significant irrespective of whether or not the mediator is the dependent variable. The study hypothesises ease of use as having a direct impact on intention to use renewable energy. Model 4 shows that the mediating variable, attitude, carries a positive relationship with intention to use renewable energy. Finally, model 5 reports that the two indirect variables, relative advantage and perceived behavioural control, carry a stronger relationship with the mediating variable, attitude, when compared with intention use as the dependent variable. These five models lend support to the six hypotheses offered in this study. To accomplish the test of significance of indirect relationship, Table 5 shows the Sobel test statistics and '*p*' values.

TABLE 5. Test for significance for indirect relationship

	Relative Advantage		Perceived Behavioural Control	
	All Xs' with Mediator*	X >>> Mediator	All Xs' with Mediator	X >>> Mediator
Beta	0.286	0.345	0.286	0.325
Standard Error	0.069	0.053	0.069	0.057
Sobel Z	3.496		3.353	
p Value (Two tailed)	0.000		0.000	

Note: Dependent variable: intention to use

Under Sobel test, testing for the significance of individual indirect relationship is conducted one variable at a time. The study has two indirect variables: relative advantage and perceived behavioural control. For the both the variables, Sobel Z score is significant at 1% level. These results indicate that attitude is a significant mediator between the two indirect variables and intention to use renewable energy. Our results are partially supported by technology acceptance model (TAM) (Davis et al. 1989). In TAM, ease of use is an indirect variable to influence behavioural intention mediated by attitude. However, usefulness, a proxy of relative advantage, is reported as having an indirect relationship with intention. Theory of planned behaviour and theory of reasoned action give support to this study. Using TRA and TPB for renewable energy research is among the earliest research in Malaysia. Hence, it is not possible to compare results here with those of the other studies. This part of the limitation we leave for future research.

Various Western literatures support the findings of this study. Higher relative advantage and stronger perceived behavioural control positively influence attitude towards renewable energy use (Beck & Martinot 2004; Cass & Walker 2009). Awareness, technical know-how (ease of use) and low cost positively influence intention to use renewable energy (Beck & Martinot 2004; Brohmann et al. 2007; Rodrigues, Montañés & Fueyo 2010; West et al. 2010). Government and private companies that are responsible for marketing renewable energy technologies to households may capitalise on the findings of this study. Specialised marketing and training programs can be organised to train and educate the communities on the technical know-how and social use of the renewable energy technologies. Economic incentives from the government may ease the adoption to new technology.

CONCLUSION

The lack of studies on the impact of attitude towards renewable energy used in emerging nations increases the risk of understanding the nature of behaviour of the potential users. This study is undertaken to understand what factors users consider as important when they think about purchasing renewable energy technology in Malaysia. Using factor analysis and multiple regression analysis on data collected from 200 respondents, this study finds that there are direct and indirect factors influencing intention to use renewable energy. The three significant direct factors are level of awareness, benefit-cost trade-off, and ease of use. Meanwhile, the two indirect factors are relative advantage and perceived behavioural control. Attitude mediates between the indirect factors and the intention to use renewable energy. Theory of reasoned action and theory of planned behaviour lend support to the findings of the study. Government and private companies can design training and marketing programs to educate communities on the use of renewable energy to ease the adoption process.

From corporate point of view, extensive marketing programme has to be developed in order to create awareness of the users. Government has to make sure the presence of adequate policy support in order to keep the cost of using renewable energy at a reasonable level. Community awareness programmes can be developed to train users on the ease of use of the new renewable energy technology. Awareness programmes should be driven with the focus to energise the users on saving the planet earth from global warming and ultimate destruction. Policy supports must come in phases so that users develop a better understanding of the usage of the new techniques and they feel comfortable with the prices charged. Other incentive such as financial support from the government is also important to encourage citizen of Malaysia to adopt renewable energy.

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