

Nguyen Truong Son; Doan Hong Le; Dong Luu Nghiem et al.

## Article

# Factors affecting household's intention to save power : the case of Chau Thanh District-Vietnam

## Provided in Cooperation with:

International Journal of Energy Economics and Policy (IJEPP)

**Reference:** Nguyen Truong Son/Doan Hong Le et. al. (2022). Factors affecting household's intention to save power : the case of Chau Thanh District-Vietnam. In: International Journal of Energy Economics and Policy 12 (2), S. 299 - 308.  
<https://econjournals.com/index.php/ijeep/article/download/12927/6685/30023>.  
doi:10.32479/ijeep.12927.

This Version is available at:  
<http://hdl.handle.net/11159/8740>

## Kontakt/Contact

ZBW – Leibniz-Informationszentrum Wirtschaft/Leibniz Information Centre for Economics  
Düsternbrooker Weg 120  
24105 Kiel (Germany)  
E-Mail: [rights\[at\]zbw.eu](mailto:rights[at]zbw.eu)  
<https://www.zbw.eu/econis-archiv/>

## Standard-Nutzungsbedingungen:

Dieses Dokument darf zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden. Sie dürfen dieses Dokument nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, aufführen, vertreiben oder anderweitig nutzen. Sofern für das Dokument eine Open-Content-Lizenz verwendet wurde, so gelten abweichend von diesen Nutzungsbedingungen die in der Lizenz gewährten Nutzungsrechte.  
<https://zbw.eu/econis-archiv/terms-of-use>

## Terms of use:

*This document may be saved and copied for your personal and scholarly purposes. You are not to copy it for public or commercial purposes, to exhibit the document in public, to perform, distribute or otherwise use the document in public. If the document is made available under a Creative Commons Licence you may exercise further usage rights as specified in the licence.*



## Factors Affecting Household's Intention to Save Power: The Case of Chau Thanh District – Vietnam

Nguyen Truong Son<sup>1</sup>, Doan Hong Le<sup>2\*</sup>, Dong Luu Nghiem<sup>3</sup>, Doan Quynh Giang<sup>4</sup>

<sup>1</sup>University of Economics, The University of Danang, Vietnam Da Nang, Vietnam, <sup>2</sup>Research Institute for Socio-Economic, Duy Tan University, Vietnam, <sup>3</sup>Director of Chau Thanh Electricity Company, Vietnam, VATUCO 309 JSC, Da Nang, Vietnam.

\*Email: [dlehong@yahoo.com](mailto:dlehong@yahoo.com)

Received: 19 November 2021

Accepted: 18 February 2022

DOI: <https://doi.org/10.32479/ijeep.12927>

### ABSTRACT

Saving electricity is a matter of concern now and in the future when electricity consumption tends to increase, greatly affecting national energy security. Synthesizing research and theories related to the topic, the author's team has conducted a survey of 305 households in Chau Thanh district, Kien Giang province, Vietnam to assess the influencing factors and the extent to which they are affected. The influence of factors on the intention to save electricity. The results of the regression analysis show that the factors in the research model explain 59.4% of the change in the intention to save electricity of households in the study area. The study also shows the level of impact of factors on the intention to save electricity of households in order of decreasing impact level. Based on the research results, the authors will make some feasible and reasonable recommendations for local and national electricity saving policies, as a basis for different types of electricity consumption and other similar service for reference. Survey data were analyzed using SPSS version 20.0, including descriptive and inferential statistics. Research results show that most of the variables have a positive correlation with the intention to save electricity of people in the area.

**Keywords:** Intention to Save Electricity, Household, Chau Thanh District

**JEL Classifications:** C1, D12, H31, Q4

### 1. INTRODUCTION

In recent times, saving electricity is an urgent issue for Vietnam in general and Electricity of Vietnam (EVN) in particular. Using energy with high efficiency is an integral part of the harmonization strategy between economic development, energy security and environmental protection. Central Resolution No. 18/NQ-TW dated October 25, 2007 of the Politburo on orientations for Vietnam's national energy development to 2020, with a vision to 2050; Decision No. 1855/QĐ-TTg dated December 27, 2007 of the Prime Minister approving the National energy development strategy to 2020, with a vision to 2050 has affirmed the policy of encouraging economical use of energy. and efficiency is a key task during the period of industrialization and modernization of the country. However, in recent years, Vietnam

still has some difficulties in ensuring electricity supply in the dry season months, especially when there is a prolonged drought, there is not enough water for hydropower plants to generate electricity. Meanwhile, the implementation of electricity saving has not received the real attention of the social community, people and businesses, wasting national resources and adversely affecting the environment.

Author Abrahamse et al. (2005) has carried out 38 studies on energy saving, energy use in the field of environmental psychology and the social field. This author's studies are divided into 2 categories according to targeting strategies: Consequential strategies including reward and feedback. The second strategy is the premise strategy with the following contents: information, commitment, goal setting, modeling.

In the antecedent strategy, according to Abrahamse et al. (2005), the concept of commitment is understood as promises in behavior change, actions performed in writing or orally. But according to author Katzev and Johnson (1983), there is an analytical study that evaluates the effects of commitment on electricity consumption, but the study assumes that each individual's power consumption needs will largely depend on their needs regarding electricity usage. These individuals use electricity in four groups through the following analytical techniques: The first is to create a brief questionnaire to ask about electricity consumption and usage and ask these individuals to implement a 10% reduction in electricity consumption compared to the current one; The second is to make a commitment for these individuals to save 10% of electricity consumption; The third is to make another questionnaire and use the mandatory method and get these individuals to participate and sign a commitment to reduce electricity by 10% compared to the current one. Also according to this author, the results show that when a household receives an electricity bill for the month of their household, it shows that people in the 3<sup>rd</sup> group (Required to sign a commitment to reduce electricity consumption by 10%). consumption) has the lowest power consumption and is the most efficient during the monitoring and signing period of 12 weeks. In fact, these participating groups realize almost the same savings as the other groups. Therefore, the author McCalley (2006) came to the conclusion that the energy saving behavior of groups and households clearly shows their desire to save electricity and energy.

Next is the author Becker (1978) who also conducts studies to build and establish commitment goals like the authors of previous studies in order to identify the factors affecting energy saving and find the distinctive. He did the research by clearly defining two goals that he needed to achieve in the research. Firstly, households participating in his research must ensure to save at least 2% of their electricity consumption; Second, he set a higher and more difficult target when he required households participating in the survey to save at least 20% of their electricity consumption. The households participating in this study were all supported by him by providing and publicizing the electricity consumption parameters of electrical appliances. So that the participating households understand that they need to reduce their use of electricity, devices to save energy most effectively. The research results of Becker (1978) have shown that the group of households in his second target with a minimum saving of 20% of electricity consumption is proven to be more efficient than the group of households that save at least 20% of electricity consumption. minimum 2% of power consumption. So he came to the conclusion that the set goal should be increased in difficulty, not too easy, then the effect will be opposite.

McMakin et al. (2002) “conducted investigations into energy efficiency issues at two US military bases where residents did not have to pay their own electricity bills. The approach is tailored to the socio-psychological model in each particular household. They measured before and after conducting surveys on energy use and conducted a measure of people's end-use behavior. People's desire is to implement energy saving to set an example for their children.” McMakin et al. (2002) determined that “there exist some aspects of psychosocial modeling that are useful in promoting

behavioral change in energy use, but others are not” (McMakin et al., 2002, p. 15).

With the consequential strategy of using the intervention by consequences, the negative or positive impact of the results will change the behavior of using electricity, the behavior of saving electricity. Reward and feedback elements are the most common elements in consequential strategies.

Author Van Houwelingen and Van Raaij (1989) conducted a study: “Study on the effect of continuous feedback on energy consumption of households participating in the project.” The author selected a sample of 325 households and divided these 325 households into two groups as follows: The first group made a commitment to save 10% of electricity consumption; The second group, on the contrary, disagrees with the goal of saving electricity. Out of 325 households participating in the study, 50 households are fitted with electronic devices to monitor power consumption and update electricity consumption data every day against the energy saving target, was originally set. The remaining households are further divided into two groups: The first group is responsible for receiving feedback on electricity consumption and the second group is responsible for monitoring electricity consumption. Research results of Van Houwelingen (1989) have shown that the self-monitoring group reduced by 5.1%; The group that received feedback on consumption and electricity prices saved up to 7.7%. The biggest reduction was the result of a group of 50 households fitted with electronic devices that tracked their results every day and compared with the electricity saving target, they saved an average of 12%. Therefore, the author Van Houwelingen (1989) made a conclusion about the research that information on consumption, electricity index, apartment area, electricity price has a strong influence on the electricity saving behavior of households. family and individuals.

Author McClelland and Cook (1980) conducted research in an apartment complex, where the author conducted an energy saving contest for a group of 4 apartments in this apartment complex. Information on electricity consumption, information on energy saving measures is communicated to these 4 households every week. The contest takes place for two weeks, then he will summarize and award 80 USD to the winning apartment. The contest lasted for 12 weeks, all 4 apartments reduced their electricity consumption by 6.6% with close results. Finally, McClelland (1980) concluded that the money factor has a short-run effect on the energy-saving behavior of households.

Wilhite (2000) “considered that the nature and causes of energy demand have been simplified, reduced or omitted in studies of energy use policy. They argue that social scientific research on energy demand has largely been limited by the behaviors of energy users” (Wilhite, 2000, p. 1). “Though over the years, many energy-saving measures have been developed based on increased energy demand in the United States and Europe and in support of new policies in mitigating climate change. The new approach considers not only the assessment of consumer awareness, but also social norms and networks of social organizations” (Wilhite, 2000, p. 109). In other words, with

a new approach, the author not only analyzes the decisive factors related to energy saving behavior, but also guides people on how to organize the network of infrastructure, technology, technology in energy conservation.”

## 2. LITERATURE REVIEW

### 2.1. Intention – Behavior to Save Electricity

Energy in general or electricity in particular is a specific product necessary for daily life. Like it or not, every family has to buy and use it. Power-saving behavior is the act of shutting off electricity when not needed, using electricity highly efficiently, investing in power-saving devices to reduce electricity consumption. Efficient use is using the least amount of energy and still satisfying the needs of use. Energy saving intention is a positive and important predictor of household energy saving behavior (Wang et al., 2018).

According to Ajzen, behavioral intention is considered as the sum of motivational factors affecting an individual's behavior, it represents the willingness or effort that each individual will put into performing that behavior. Most human behavior is predictable based on intention because behaviors are voluntary and controlled by intention. The intention of the behavior is considered as the intermediate antecedent of the behavior. It is understandable that in most studies of consumer behavior, intention and behavior are considered as one factor, or if there is a difference, the relationship between them is also very close.

There are many energy-saving behaviors in households, including all energy consuming activities such as lighting, cooking, air conditioning, refrigeration and entertainment (Leighty and Meier, 2011). Furthermore, some researchers point out that behavior change interventions are very diverse that can be divided into different research directions, such as (1) research on behavior change to change behavior vi to use energy more efficiently (Abrahamse et al., 2005; Attari et al., 2010; Barr et al., 2005; Black et al., 1985; Poortinga et al., 2003); (2) Behaviors related to a decrease in usage or comfort or user satisfaction, convenience, for example: turning off lights or reducing device usage (Karlin et al., 2014; Liu et al., 2012; Wang et al., 2018).

### 2.2. Theoretical Foundations

#### 2.2.1. Basic variables in the theory of planned behavior TPB (Ajzen and Fishbein, 1975)

Authors Ajzen and Fishbein (1975) have studied rational action theory and these two authors are considered pioneers in this field, the content of action theory is as follows: “This theory is designed Design is based on the assumption that people often act rationally, considering the information available around them and the consequences of their actions. According to TRA, behavior is determined by the intention to perform that behavior. Intention is the state of awareness immediately before performing the behavior; is a factor that leads to behavior. Therefore, behavioral intention (BI) is the most important predictor of behavior and is influenced by two factors: Attitude Toward Behavior (AB) and Subjective Norm (SN). SN, which act as functions for a person to lead to perform a behavior.

In this model, it can be easily recognized that the higher the liking attitude and the higher the cognitive control, the higher the intention to lead to buying behavior. However, this model only predicts voluntary behaviors, that is, naturally arising from within the behavior, the fact that actions do not occur naturally, but instead in which a lot of behavior takes place due to the influence of other factors. It is these factors that determine the buying behavior of customers. Therefore, Ajzen (1991) has based on this theory to develop and improve with a new model called the theory of fixed behavior TPB.”

According to Ajzen (1991), TPB is the development and improvement of TRA (Theory of Reasoned Action). In addition to the concepts of attitudes and subjective norms, a third concept, which Ajzen claims to influence human intentions, is cognitive behavioral control. Meanwhile, Perceived Behavioral Control reflects how easy or difficult it is to perform a behavior and whether the behavior is controlled or limited. They think the more resources and opportunities there are, the fewer barriers there are and the greater the potential for perceived control over behavior.

Applying TBP in the context of electricity efficiency, it can be inferred that, (1) when people have a positive attitude towards saving electricity, (2) they think that the people around them want if they energy saving and (3) they can dedicate enough resources and opportunities to implement behavior, the leader's energy saving intention will increase. Therefore, it is assumed that:

#### 2.2.2. Attitude toward behavior (AB)

“Considered as a positive or negative personal emotion that is influenced by psychological factors and the situation being encountered. Other factors influence attitudes towards business behavior, such as: willingness to take risks, locus of control, freedom, independence. The attitude of each person, each individual to the negative or positive assessment of the behavior of saving electricity and using electricity depends greatly on the finances, time, and effort of that individual. Therefore, attitudinal variables have a positive impact on energy saving behavior.

H<sub>1</sub>: Attitude factors have a positive (+) effect on the intention to save electricity of households in Chau Thanh district, Kien Giang.

#### 2.2.3. Subjective norm (SN)

“The perception of influence from the social community is defined as the perception of social pressure to perform or not perform the behavior (Ajzen, 1991). It is the influence of important and close people that can influence the individual to perform the behavior.” Subjective norm or in other words is the influence of relatives, friends, family, colleagues on saving behavior or not doing energy saving behavior. If relevant people such as family, friends, colleagues. are all interested in saving electricity, that behavior will have a positive impact on each individual's behavior and vice versa.

H<sub>2</sub>: Subjective normative factors have a positive (+) effect on the intention to save electricity of households in Chau Thanh district, Kien Giang

### 2.2.4. Perceived behavioral control (PBC)

“Reflects the ease or difficulty of performing a behavior and whether the performance of that behavior is controlled or restricted. Ajzen (1991) suggested that behavioral control factors directly affect the intention to perform the behavior and if correct in their perception, then behavioral control also predicts the behavior. When these three factors combine, it creates a change in behavior.” Behavioral control recognition “reflects how easy or difficult it is to perform a power-saving behavior and whether the performance of that behavior is controlled or restricted. Customers themselves have a good degree of control over energy saving behavior will have a positive impact on the intention to save electricity.”

H<sub>3</sub>: Perceived behavioral control factors have a positive (+) effect on the intention to save electricity of households in Chau Thanh district, Kien Giang

## 2.3. Basic Variables in the Standard Operational Model NAM

The NAM standard operating model (Schwartz and Howard, 1981) considers pro-environmental behavior as a form of altruism, to the extent that individuals have to give up personal interests instead of collective interests. Behavioral tendencies are influenced by three factors: (1) personal ethical standards; (2) awareness of responsibility; (3) Consequence perception. Schwartz (1977) originally developed NAM in the context of altruistic behavior. Personal norms are at the core of this model. Schwartz (1977) claims that these norms are experienced positively “as feelings of moral obligation but not as intentions” (p. These personal norms are used in NAM to predict individual behavior. The model states that these personal norms are determined by two factors: the perception that performance (or failure to perform).

These personal norms are used in NAM to predict individual behavior. The model states that these personal norms are determined by two factors: a sense that performing (or not performing) a particular behavior has certain consequences, and a feeling of responsibility for the behavior. perform a particular behavior (Schwartz, 1977). Most studies interpret NAM as a mediation or regulatory model.

Bertoldo and Castro assert that a Personal Code of Conduct is an individual who performs actions based on their moral responsibility. In the NAM model, personal ethical standards are considered as the core factor. An individual's environmental behavior is determined by personal ethical standards and social ethical standards. More personal ethical standards will motivate individuals to engage in environmental behaviors and vice versa, when an individual has low personal ethical standards will hinder environmental behavior. In this study, it can be predicted that residents with high personal ethical standards will feel more responsible for saving electricity than others. They consider saving electricity as an obligation that every citizen must contribute to ensuring national energy security and protecting the ecological environment. Waste of electricity or not saving electricity are actions that do not conform to their ethical standards and obligations that make them feel uncomfortable. So, we can speculate that the higher a person's moral standards, the greater the potential for energy savings.

Previous studies that integrated NAM and TPB have found that the influence of personal norms on behavior is mediated by intentions. Furthermore, these studies have found that the inclusion of intentions in NAM significantly increases explanatory variance in behavior (about 17%, see Bamberg and Möser, 2007; Bamberg et al., 2007). This finding underscores Ajzen's (1991) view that intention is the most immediate and important predictor of behavior, and that intention mediates the influence of other variables, even those of emotional number. In addition, studies that include personal norms in TPB show that personal norms increase the explained variance of behavioral and behavioral intentions in TPB (Staats et al., 1999). Taken together, these findings imply that the integrated NAM-TPB model can best explain environmental behavior. Therefore, the present study not only explores how pride and expected guilt are related to individual norms and behaviors in NAM, but also in the integrated NAM-TPB model.

Therefore, we believe that: It is very important to be aware of each individual's behavior, they can see that they are personally responsible for using energy to save energy, the energy saving behavior will increase. And vice versa, when an individual's behavioral awareness does not really understand and feels they are not responsible for saving energy, their behavior will act in the opposite direction.

H<sub>4</sub>: Consequential factors have a positive (+) positive effect on the intention to save electricity of households in Chau Thanh district, Kien Giang

When each individual realizes the consequences of wasting energy such as causing climate change, resource depletion, and adverse impact on the living environment, their energy saving behavior will adjust in a positive direction. As for individuals who do not see the consequences of wasting energy, their behavior will act in a negative direction.

H<sub>5</sub>: The factor of perceived responsibility has a positive (+) effect on the intention to save electricity of households in Chau Thanh district, Kien Giang

Conforming behavior is “behavior that conforms to personal moral standards can lead to a sense of pride, which can in turn bring guilt to the individual. This shows that customers themselves have personal ethical standards consistent with the issue of electricity saving, which will have a positive impact on the intention to save electricity.”

H<sub>6</sub>: Personal ethical standards have a positive (+) positive effect on the intention to save electricity of households in Chau Thanh district, Kien Giang

## 2.4. Electricity Price

By applying multivariable regression model, some scholars have found that increasing energy prices significantly reduces people's energy consumption; Furthermore, economic costs play a negative role in regulating energy consumption (Webb et al., 2013). Gyamfi and Krumdieck (2011) find that energy saving behavior in New Zealand is mainly influenced by ecological factors such as electricity prices and financial support.

Price is “the monetary expression of the value of electricity used, that is, the amount to be paid for that use of electricity. Price is generally a variable that revolves around value. When the supply and demand of electricity basically match, the price reflects and matches the value of that electricity price, this case rarely happens. Electricity prices will normally be higher because electricity is currently a limited energy source. Therefore, people’s awareness of saving electricity will increase when electricity prices increase and vice versa” (Quynh, 2013; Nuong, 2015).

H<sub>7</sub>: Electricity price factor has a positive effect (+) on the intention to save electricity of households in Chau Thanh district, Kien Giang.

Based on TBP, NAM and previous studies. Proposed research model including 7 hypotheses (Figure 1).

### 3. RESEARCH METHODS

#### 3.1. Survey Tool

The scale of concepts in this study is based on previous scales and makes some adjustments to fit this research context. The “Attitude” scale is referenced by the author from the author’s scale “Abrahamse and Steg (2009)” including 3 observed variables coded TDO1-TDO3. The discussion group agreed to add the observation “Saving electricity does not take up much of my time” to further clarify the scale. For the concept of “subjective norm” and “perceived consequences,” the variables in the author’s research “Carlsson-Kanayama, 2007” are inherited. There are 4 variables of subjective norm coded CQAN1-CQAN4 and 4 variables of cognitive consequences coding HQ1-HQ4 consistent in the context of this study. The “perceived behavioral control” scale refers to the author’s original scale “Abrahamse and Steg (2009)” consisting of 4 observed variables coded as NTHV1-NTHV4 respectively. After the group discussion, the discussion group proposed to add the observed variable: “I think there is no obstacle for economical use of electricity”. The author’s “perceived responsibility” scale refers to the author’s scale “Carlsson-Kanayama, 2007” consisting of 5 observed variables coded TN1-TN5. The “personal ethical standards” scale is based on the author’s scale “Abrahamse and Steg (2009)” consisting of 3 observed variables coded DDCN1-DDCN3. The group proposed to add the observed variable: “I feel wasteful when I

don’t save electricity.” The month of measuring “electricity price” is referenced by the author from the author’s scale “Carlsson-Kanayama, 2007” consisting of 3 observed variables coded GIA1-GIA3. And finally, the 4 observed variables of the scale “intention to save electricity” are referenced by the author from the scale of “Carlsson-Kanayama, 2007” and are coded as YDINH1- YDINH 4, respectively. To evaluate “The factors affecting the intention to save electricity of households in Chau Thanh district, Kien Giang province” the author uses a 5-point Likert scale from Strongly disagree (1) to Strongly agree (5).

#### 3.2. Collect Samples and Data

The direct survey at electricity users was conducted between October 2019 and February 2020. People living and using electricity in Chau Thanh district, Kien Giang were selected to conduct data collection based on convenient sampling technique. Chau Thanh and Kien Giang districts represent the moderately developed provinces in Vietnam, and at the same time represent the locality of the West of Vietnam, the people in the river region, electricity reaching each person’s house is still difficult compared to the locality. other side. A questionnaire was built with 3 parts: Part 1, a brief introduction to the survey. Part 2, Content of questions measuring factors affecting the intention to save electricity of households in Chau Thanh district, Kien Giang. And the last part is the collection of personal information of the subject to serve the research process. The number of questionnaires distributed was 310 votes, after removing the unsuitable questionnaires (incomplete answers, with the same answers for all questions), there were a total of 305 votes. Valid surveys (98.38%) were analyzed for evaluation. reliability, validity and relevance of the hypotheses.

### 4. RESEARCH RESULTS

#### 4.1. Demographics of Respondents

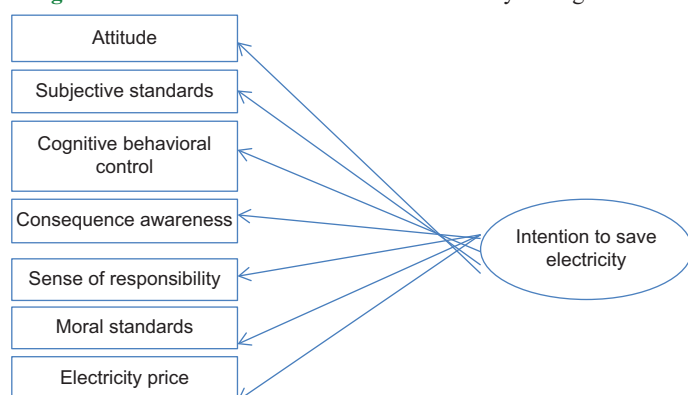
According to the survey results, there is no big difference in the structure between men and women (Male accounted for 56.1%, Female accounted for 43.9%). The sex ratios of respondents are consistent with the demographic characteristics of Vietnam (General Statistics Office of Vietnam 2019). The surveyed age ranges from 25 to over 50 years old, of which the age group from 35 to 50 accounts for the highest proportion with 39% and the lowest is under 25 years old.

Survey participants with college/university degrees accounted for the highest proportion with 153 people, accounting for 50.2%. Respondents in the age group from 25 to over 50 years old account for a high proportion of 91.8%. This is the main force of working age, they are working in many different industries, many of which require professional qualifications. Therefore, a high percentage of respondents graduating from college-university is inevitable. Finally, the survey respondents in the income group of 5-10 million dong accounted for the highest proportion with 32.5% (Table 1).

#### 4.2. Reliability Test

Cronbach’s Alpha coefficient of all factors is greater than 0.6, the correlation coefficient of the sum of the variables is greater than 0.3, showing that the scale meets the testing standard. Particularly

Figure 1: Research model of household electricity saving behavior



Source: Author synthesized from research hypothesis

for the scale of perception of consequences, after running the first test, the variable HQ2 has a variable-total correlation coefficient of  $0.286 < 0.3$ . Therefore, the author removes this variable and conducts the test again. Cronbach's Alpha coefficient of the second scale of perception of consequences is 0.895, the correlation coefficient of the sum of the variables in the scale is  $> 0.3$  (after removing the variable HQ2). Therefore, the variables of the cognitive consequences scale that will be used are HQ1, HQ3, HQ4. The model has 07 scales to ensure good quality with 31 characteristic variables (Table 2).

### 4.3. Exploratory Factor Analysis

With the hypothesis H01: is between 27 observed variables in the population, there is no correlation with each other. KMO and Bartlett's test in factor analysis show that this hypothesis is rejected ( $\text{Sig} = 0.000$ ); KMO coefficient is 0.784 (satisfy the condition:  $0.5 < \text{KMO} < 1$ ). This result indicates that the observed variables in the population are correlated with each other and the EFA factor analysis is appropriate. With the principal component extraction method, Varimax rotation allows to extract 7 factors from 27 observed variables and the cumulative extracted variance is 73.198% (satisfactory  $> 50\%$ ) (Table 3).

Thus, after conducting EFA exploratory factor analysis, the number of observed variables is 27 observed variables, there are 7 factors representing the intention to save electricity with the characteristic variables of the factor, compared with the original model, the author removed the variable HQ2.

Hypothesis: H02: There is no relationship between 4 observed variables in the population. Result:  $\text{sig} = 0.000 \geq \text{reject hypothesis}$  H02. KMO coefficient = 0.736 (satisfy the condition:  $0.5 < \text{KMO} < 1$ ). This result indicates that the observed variables in the population are correlated with each other and the EFA factor analysis is appropriate. With the principal component extraction

**Table 1: Structure of research sample (n=305)**

Gender	Frequency	%	Age	Frequency	%
Male	171	56.1	Under 25 years old	25	8.2
Female	134	43.9	From 25 years old to under 35 years old	96	31.5
			From 35 years old to 50 years old	119	39.0
			Over 50 years old	65	21.3
Literacy			Income		
High school and below	33	10.8	Under 5 million	80	26.2
Intermediate	106	34.8	From 5 million to 10 million VND	99	32.5
College/ University	153	50.2	Over 10 million - 20 million VND	82	26.9
Graduate	13	4.3	Over 20 million VND	44	14.4

Source: Author's survey

method, Varimax rotation allows to extract a factor with 04 observed variables and the cumulative extracted variance is  $71.224\% > 50\% \geq \text{satisfactory}$ . After analyzing EFA factors, we find that the original theoretical model is suitable for the study (Table 4).

### 4.4. Regression Analysis

(a) The test results show that  $R^2$  is adjusted by 0.594, this model explains 59.4% of the change of the dependent variable due to the independent variable in the model. Check the correlation phenomenon by Durbin-Watson coefficient ( $1 < 1.823 < 3$ ). The F-statistic of 64,578 is calculated from the  $R^2$  values of the full model at the significance level  $\text{Sig} = 0.000$ . Thus, the given multiple linear regression model is consistent with the research model and data. The results of the regression analysis are presented in the following Table 5.

The results show that the factors affecting the intention to save electricity of households in Chau Thanh district, Kien Giang province have 7 positive factors (+). All factors have significance level  $\text{sig} = 0.000 < 0.05$ , so these factors have statistical significance and are included in the regression equation. Besides, these 7 factors have a rather high tolerance (acceptance) of 0.698, 0.663, 0.787, 0.807, 0.768, 0.709, 0.755 and the VIF coefficients of the

**Table 2: Confirmatory factor analysis for measurement items**

	Factor	Cronbach's Alpha	Average of scale if variable type	Variable correlation - total correction
Electricity price	GIA1	0.740	7.23	0.505
	GIA2		7.25	0.670
	GIA3		7.04	0.532
Moral standards	DDCN1	0.817	10.49	0.728
	DDCN2		10.67	0.611
	DDCN3		10.59	0.566
	DDCN4		10.69	0.655
Consequence awareness	HQ1	0.895	6.89	0.626
	HQ3		6.75	0.877
	HQ4		6.78	0.895
Cognitive behavioral control	NTHV1	0.879	10.85	0.721
	NTHV2		10.97	0.639
	NTHV3		10.90	0.774
	NTHV4		10.88	0.825
Attitude	TDO1	0.777	9.47	0.463
	TDO2		9.80	0.616
	TDO3		9.76	0.622
	TDO4		9.58	0.629
Subjective standards	CQAN1	0.859	9.70	0.771
	CQAN2		9.76	0.670
	CQAN3		9.87	0.592
	CQAN4		9.87	0.796
Sense of responsibility	TN1	0.913	14.77	0.716
	TN2		14.66	0.879
	TN3		14.60	0.736
	TN4		14.67	0.891
	TN5		14.70	0.678
Intention to save electricity	YDINH1	0.862	10.48	0.801
	YDINH2		10.52	0.650
	YDINH3		10.48	0.604
	YDINH4		10.48	0.796

Source: Authoring base on the results of testing the reliability Cronbach's Alpha scale

7 variables are all less than 10, which means no multicollinearity occurs among independent factors in the model.

**Table 3: Results of Factor Analysis for the independent variable**

	Factor						
	1	2	3	4	5	6	7
TN2	0.932						
TN4	0.916						
TN1	0.828						
TN3	0.761						
TN5	0.707						
CQAN4		0.853					
CQAN1		0.820					
CQAN2		0.772					
CQAN3		0.730					
NTHV4			0.924				
NTHV3			0.907				
NTHV1			0.775				
NTHV2			0.688				
DDCN1				0.894			
DDCN4				0.852			
DDCN2				0.670			
DDCN3				0.606			
TDO2					0.786		
TDO4					0.784		
TDO3					0.773		
TDO1					0.643		
HQ3						0.877	
HQ4						0.870	
HQ1						0.759	
GIA2							0.832
GIA3							0.803
GIA1							0.627
Eigenvalue	5.712	4.052	3.805	1.940	1.711	1.356	1.187
Cumulative	21.155	36.164	50.257	57.441	63.776	68.800	73.198
Extracted							
Variance							
(%)							

Source: Authoring base on the results of factor analysis for the independent variable

**Table 4: Results of factor analysis on the scale of intention to save electricity**

Observed variables	Factor loading factor
YDINH1	0.907
YDINH4	0.901
YDINH2	0.799
YDINH3	0.759
Eigenvalue	2.849
Total Cumulative Extracted Variance (%)	71.224

Source: Survey results and author's processing on SPSS software, 20.0

**Table 5: Parameters of each variable in the regression equation**

Paradigm	Unnormalized coefficients		Normalization coefficient	Value t	Value Sig.	Multicollinearity	
	B	Sai số chuẩn				Acceptability	VIF
(Constant)	0.257	0.167		1.539	0.125		
TN	0.192	0.028	0.295	6.754	0.000	0.698	1.433
CQAN	0.114	0.026	0.198	4.403	0.000	0.663	1.509
NTHV	0.121	0.027	0.185	4.496	0.000	0.787	1.271
DDCN	0.082	0.026	0.128	3.154	0.002	0.807	1.240
TDO	0.084	0.027	0.127	3.055	0.002	0.768	1.302
HQ	0.121	0.024	0.214	4.940	0.000	0.709	1.410
GIA	0.210	0.030	0.293	6.964	0.000	0.755	1.325

Dependent variable: YDINH. Source: Survey results and author's processing on SPSS software, 20.0

#### 4.5. Detecting to Violations of Regression Assumptions

Histogram (Figure 2) showing a normal distribution curve superimposed on the histogram, very small mean close to 0 (mean = -8.85E-16) and standard deviation close to 1 (Std.Dev = 0.988), which shows that the distribution of residuals is approximately normal.

See the Normal P-P Plot Figure 3 above, the observed and expected values are all close to the diagonal, showing that the normalized residuals are normally distributed. The P-Plot test shows the values of the percentiles of the distribution of the variable according to the percentiles of the normal distribution. Observing the level of actual points, centered close to the expected line, shows that the research data set is good, the normalized residuals have a distribution close to the normal distribution.

The results from the Figure 4 show that the percentiles fluctuate quite uniformly above and below the zero coordinate axis. The percentiles are almost in the range -2 to 2 along the zero coordinate, so a linear relationship is assumed. included in the model is rejected.

#### 4.5. Checking for Multicollinearity

With the analysis results, the largest VIF coefficient is only 1.509 < 2 and the lowest Tolerance coefficient is 0.663 > 0.5, so it can be concluded that there is no multicollinearity in the model. Durbin-Watson coefficient = 1.823. According to the condition, this value is in the range  $1 < d < 3$ . This result shows that it falls into the acceptable range, therefore, the research model does not violate the assumption of correlation.

From the statistical analysis of regression coefficients in Table 5, it shows that 7 independent variables GIA, NTHV, DDCN, HQ, TDO, TN, CQAN all have the same impact on the intention variable. household electricity savings in Chau Thanh district, Kien Giang province because the standardized regression coefficients ( $\beta$ ) of these variables are all positive. Compare the level of impact of these five variables on the dependent variable (YDINH) in descending order as follows: TN variable has the strongest impact ( $\beta_1 = 0.295$ ), followed by GIA variable ( $\beta_7 = 0.293$ ), next followed by the variable HQ ( $\beta_6 = 0.214$ ), followed by the variable CQAN ( $\beta_2 = 0.198$ ), followed by the variable NTHV ( $\beta_3 = 0.185$ ), followed by the variable DDCN ( $\beta_4 = 0.128$ ) and the weakest effect was the variable. TDO ( $\beta_5 = 0.127$ ). The normalized regression has the form:

$$YDINH = 0.295 * TN + 0.198 * CQAN + 0.185 * NTHV + 0.128 * DDCN + 0.127 * TDO + 0.214 * HQ + 0.293 * GIA$$

#### 4.6. Levene Test

The Levene test results show that the Sig values of all factors are  $>0.05$ , so there is no difference between the control variables and the impact on the intention to save electricity of households in Chau Thanh district., Kiên Giang, Vietnam (Table 6).

#### 4.7. Discussing Research Results

The research results show that, the degree of influence of factors on the intention to save electricity of households in Chau Thanh district, Kien Giang province includes 07 factors arranged in order of influence level as follows: (1) Awareness of responsibility (TN); (2) Consumer electricity price (GIA); (3) Consequence perception (HQ); (4) Subjective standards (CQAN); (5) Perceived behavioral control (NTHV); (6) Personal ethical standards (DDCN); (7) Attitude towards saving electricity (TDO).

Perceived responsibility (Standardized Beta = 0.295) has a positive impact with the intention to save electricity of households in Chau Thanh district, Kien Giang province. This makes sense because

only when people have the right perception can they take the right action. Recognizing responsibility for saving electricity as a duty of citizens will help contribute to economic development, environmental protection, and climate change. Therefore, in this study, it is reasonable that the factor Perceiving responsibility is the most influential factor by the respondents.

Consumer electricity price (Standardized Beta = 0.293) has a positive effect on the intention to save electricity of households in Chau Thanh district, Kien Giang province. This makes sense because electricity for consumption is also a commodity, so an increase in electricity prices will also contribute to the intention of households to save electricity.

Consequence perception (Standardized Beta = 0.214) has a positive impact with the intention to save electricity of households in Chau Thanh district, Kien Giang province. This is reasonable because only by being aware of the consequences, people are motivated to change their behavior, thereby affecting their intention to save electricity in daily life.

Subjective norm (Standardized Beta coefficient = 0.198) has a positive effect with the intention to save electricity of households in Chau Thanh district, Kien Giang province. This makes sense because people are often governed by many relationships in life. It is also reasonable that family, friends and relatives factors affect the intention to save electricity.

Perceived behavioral control (Standardized Beta = 0.185) has a positive impact with the intention to save electricity of households in Chau Thanh district, Kien Giang province. This makes sense because people only intend to save electricity when they are aware of their electricity usage.

Personal ethical standards (Standardized Beta = 0.128) have a positive impact with the intention to save electricity of households in Chau Thanh district, Kien Giang province. This makes sense because personal morality is the process of properly perceiving the good values of life. People with good ethical standards will

Figure 2: Histogram

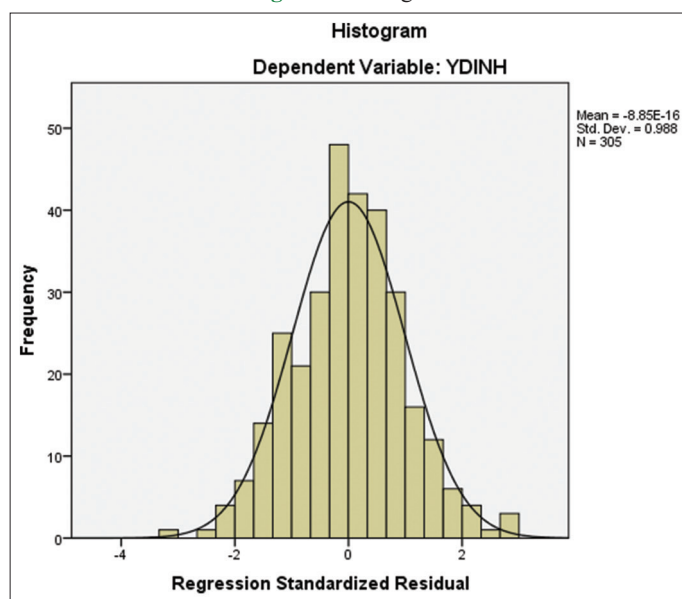


Figure 3: P-P plot

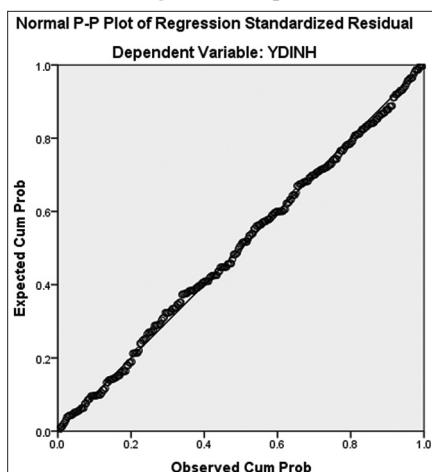
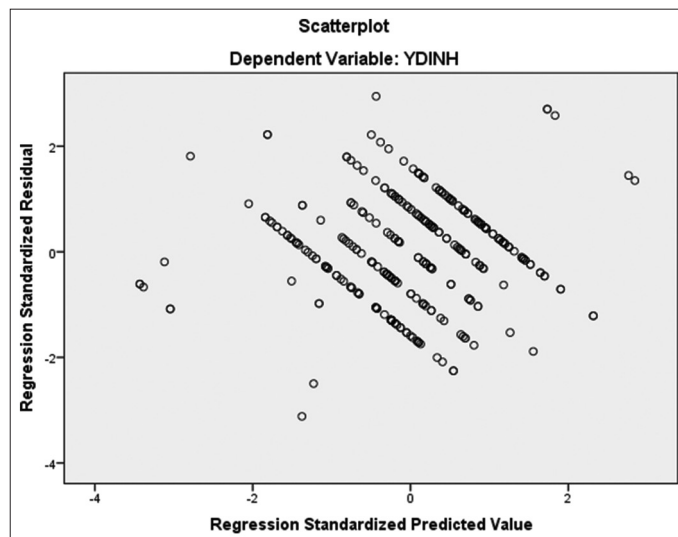


Figure 4: Scatter chart



**Table 6: Results of Levene test**

	Gender	Age	Literacy	Income
Sig	0.680	0.143	0.499	0.939
Sig t-test	0.138	0.645	0.902	0.605

Source: Survey results and author's processing on SPSS software, 20.0

have the right actions and the intention to save electricity is also influenced by this factor.

Attitude towards saving electricity (Standardized Beta = 0.127) has a positive impact with the intention to save electricity of households in Chau Thanh district, Kien Giang province. This is reasonable because just like the perception of saving electricity, the right attitude towards the act of saving electricity also contributes significantly to the intention to save electricity.

This result is consistent with previous studies such as Abrahamse et al. (2007); Fornara et al. (2016) and Cheung et al. (2017). In contrast to the study, Wang et al. (2018) argues that subjective norms have a negligible influence on people's intention to save electricity.

Compared with the research of Becker (1978), the study of factors affecting the intention to save electricity of households in Chau Thanh district, Kien Giang of the author has similarities with some observed variables such as: attitude; Cognitive factors control behavior. Compared with the study of Martiskainen (2007), Poortinga et al. (2003), the study of the factors affecting the intention to save electricity of households in Chau Thanh district, Kien Giang also has the same results. highly similar to the consequential factors of not implementing energy saving such as: Factors of awareness of consequences; The element of perception of responsibility...

In Vietnam, electricity is an essential daily consumer product exclusively distributed by the state. In the context of continued increasing demand for electricity and shortage of electricity supply, the contributions of this study have great significance for policy makers and the power industry in addressing the problem of imbalance. supply - demand. Theoretically, this is the first study in Vietnam to use the extended TBP model in combination with the NAM model to comprehensively assess the impact of internal psychological factors, and at the same time under the influence of The external factor is the price to the people's energy saving behavior.

## 5. RESEARCH IMPLICATIONS AND CONCLUSION

The increased awareness of people's responsibility about electricity saving consciousness will greatly contribute to the efficiency of electricity saving of households in general and households in Chau Thanh district, Kien Giang province in particular. To do this, local authorities as well as Kien Giang Power Company need to synchronously implement the following solutions: Regularly organize programs to help people and households raise awareness of their behavior. saving electricity, when people's

awareness changes, their behavior will change and contribute to helping people save electricity; Implement training programs on economical use of electricity, how to choose electrical equipment that uses electricity sparingly; Directing businesses and people in Chau Thanh district, Kien Giang province to use energy-saving devices, ways to save electricity at peak hours.

Secondly, guide and propagate for households in Chau Thanh district, Kien Giang province to understand how to calculate the progressive electricity price according to which "the more electricity is used, the higher the electricity price will be and vice versa." At the same time, organize meetings and seminars to guide businesses and people in Chau Thanh district, Kien Giang province to know how to calculate electricity bills according to the progressive method, when people see an increase in electricity use. the more electricity bills increase, then people will understand and see that the cost of electricity increases, people's awareness of saving electricity will increase, then the sense of self-discipline will work in raising awareness. save electricity. Local authorities need to contact manufacturers and distributors of electrical equipment in Chau Thanh district, Kien Giang province to produce and distribute energy-saving electrical equipment and specify power consumption capacity so that people know and choose electrical equipment suitable to their needs.

Thirdly, when people are aware of the consequences of wasting electricity, affecting the household economy, the environment, and national energy resources, their consciousness of saving electricity will increase. households in Chau Thanh district, Kien Giang province will increase and promote efficiency. Therefore, it is necessary to combine with local authorities in raising people's awareness, showing people the consequences of wasting electricity, which will have a long-term impact on national resources.

Fourthly, in order to improve the composition of subjective standard factors, Chau Thanh District People's Committee needs to associate and coordinate with Kien Giang Power Company to regularly carry out propaganda on the consciousness of saving electricity for people in the world. locality. Only in this way will it contribute to saving electricity, reducing the cost of electricity and ensuring the capacity for national security. Collecting and composing slogans and songs to communicate the consciousness of saving electricity, the consequences of wasting electricity and wasting energy. Helping people change their behavior, change their awareness in automatically turning off unnecessary electrical equipment and limiting electricity use during peak hours will greatly contribute to saving electricity and energy.

Fifth, Regular implementation of education and propaganda is the most important and most effective solution to help raise people's awareness about saving electricity and change people's electricity-saving behavior. Chau Thanh Electricity cooperates with the Department of Economics - Infrastructure to implement educational programs for students from primary school to university level about the role and importance of energy saving and electricity saving. Raise awareness to show people the benefits of saving electricity nationally and locally. Clearly show everyone that the consequences of wasting electricity will adversely affect

national resources, adversely affect the living environment. Make the most of the media and mass media to propagate and raise awareness for the people.

Sixth, the composition of personal ethical standards also significantly affects people's intention to save electricity. Local authorities should help people understand that they have an obligation to save electricity, they feel guilty for wasting electricity. To do this, it is necessary to raise people's awareness with concrete and practical actions. It is only when awareness changes that action will change. Carrying out campaigning and propaganda through meetings and seminars in the district, hanging signs and propaganda banners on energy saving.

Seventh, changing attitudes towards energy saving behavior will contribute to raising awareness and raising awareness of electricity saving of households in Chau Thanh district, Kien Giang province. Changing attitudes leads to changed behavior and leads many others to change with positive behavior. Therefore, it is necessary to raise awareness and raise awareness about the awareness of saving electricity for people in Chau Thanh district, Kien Giang province.

## REFERENCES

- Abrahamse, W., Steg, L. (2009), How do socio- demographic and psychological factors relate to households' direct and indirect energy use and savings? *Journal of Economic Psychology*, 30(5), 711-720.
- Abrahamse, W., Steg, L., Vlek, C., Rothengatter, T. (2005), A review of intervention studies aimed at household energy conservation. *Journal of Environmental Psychology*, 25(3), 273-291.
- Abrahamse, W., Steg, L., Vlek, C., Rothengatter, T. (2007), The effect of tailored information, goal setting, and tailored feedback on household energy use, energy-related behaviors and behavioral antecedents. *Journal of Environmental Psychology*, 27, 265-276.
- Ajzen, I. (1991), "The Theory of Planned Behaviour", *Organization Behaviour and Human Decision Processes*, No. 50, p179-211.
- Ajzen, I., Fishbein, M. (1980), *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Bamberg, S., Moser, G. (2007), Twenty years after hines, hungerford, and tomera: A new meta-analysis of psycho-social determinants of pro-environmental behavior. *Journal of Environmental Psychology*, 27, 14-25.
- Barr, S., Gilg, A.W., Ford, N. (2005), The household energy gap: Examining the divide between habitual- and purchase-related conservation behaviours. *Energy Policy*, 33(11), 1425-1444.
- Black, J.S., Stern, P.C., Elworth, J.T. (1985), Personal and contextual influences on household energy adaptations. *Journal of Applied Psychology*, 70(1), 3-10.
- Becker, L.J. (1978), Joint effect of feedback and goal setting on performance: A field study of residential energy conservation. *Journal of Applied Psychology*, 63(4), 428-433.
- Cheung, L.T.O., Chow, A.S.Y., Fok, L., Yu, K.M., Chou, K.L. (2017), The effect of self-determined motivation on household energy consumption behaviour in a metropolitan area in southern China. *Energy Efficiency*, 10(3), 549-561.
- Fornara, F., Pattitoni, P., Mura, M., Strazzer, E. (2016), Predicting intention to improve household energy efficiency: The role of value-belief-norm theory, normative and informational influence, and specific attitude. *Journal of Environmental Psychology*, 45, 1-10.
- Gyamfi, S., Krumdieck, S. (2011), Price, environment and security: Exploring multi-modal motivation in voluntary residential peak demand response. *Energy Policy*, 39(5), 2993-3004.
- Karlin, B., Davis, N., Sanguinetti, A., Gamble, K., Kirkby, D., Stokols, D. (2014), Dimensions of conservation: Exploring differences among energy behaviors. *Environment and Behavior*, 46(4), 423-452.
- Katzev, R.D., Johnson, T.R. (1983), A social-psychological analysis of residential electricity consumption: The impact of minimal justification techniques. *Journal of Economic Psychology*, 3(3-4), 267-284.
- Leighty, W., Meier, A. (2011), Accelerated electricity conservation in Juneau, Alaska: A study of household activities that reduced demand 25%. *Energy Policy*, 39(5), 2299-2309.
- Liu, X., Wang, C., Shishime, T., Fujitsuka, T. (2012), Sustainable consumption: Green purchasing behaviours of urban residents in China. *Sustainable Development*, 20(4), 293-308.
- Martiskainen, M. (2007), *Affecting Consumer Behavior on Energy Demand*, Final Report to EdF Energy, Brighton, East Sussex.
- McCalley, L.T. (2006), From motivation and cognition theories to everyday applications and back again: The case of product-integrated information and feedback. *Energy Policy*, 34(2), 129-137.
- McClelland, L., Cook, S.W. (1980), Promoting energy conservation in master-metered apartments through group financial incentives. *Journal of Applied Social Psychology*, 10(1), 20-31.
- McMakin, A.H., Malone, E.L., Lundgren, R.E. (2002), Motivating residents to conserve energy without financial incentives. *Environment and Behavior*, 34(6), 848-863.
- Nuong, N.T.N. (2015), *Factors Affecting People's Intention to Save Electricity in Phu Quoc Island District*, Master's Thesis. Vietnam: Nha Trang University.
- Poortinga, W., Steg, L., Vlek, C., Wiersma, G. (2003), Household preferences for energy-saving measures: A conjoint analysis. *Journal of Economic Psychology*, 24, 49-64.
- Quynh, D.L.N. (2013), *Factors Affecting Electricity Usage Behavior of Customers in Nha Trang City*, Master Thesis. Vietnam: Nha Trang University.
- Schwartz, S.H. (1977), Normative influences on altruism. *Advances in Experimental Social Psychology*, 10(1), 221-279.
- Schwartz, S.H., Howard, J.A. (1981), A normative decision-making model of altruism. In: *Altruism and Helping Behavior*. Hillsdale: Lawrence Erlbaum. p189-211.
- Staats, H.J., Wit, A.P., Midden, C.Y.H. (1996), Communicating the greenhouse effect to the public: Evaluation of a mass media campaign from a social dilemma perspective. *Journal of Environmental Management*, 45, 189-203.
- Van Houwelingen, J.H., Van Raaij, W.F. (1989), The effect of goal-setting and daily electronic feedback on in-home energy use. *Journal of Consumer Research*, 16(1), 98-105.
- Wang, B., Wang, X., Guo, D., Zhang, B., Wang, Z. (2018), Analysis of factors influencing residents' habitual energy-saving behaviour based on NAM and TPB models: Egoism or altruism? *Energy Policy*, 116, 68-77.
- Wang, S., Lin, S., Li, J. (2018), Exploring the effects of non-cognitive and emotional factors on household electricity saving behavior. *Energy Policy*, 115, 171-180.
- Webb, D., Soutar, G.N., Mazzarol, T., Saldaris, P. (2013), Self-determination theory and consumer behavioural change: Evidence from a household energy-saving behaviour study. *Journal of Environmental Psychology*, 35, 59-66.
- Wilhite, D.A. (2000), *Drought as a Natural Hazard: Concepts and Definitions*. Ch. 1. United States: DigitalCommons@University of Nebraska-Lincoln. p1-18.