



(REVIEW ARTICLE)



Factors determining people's use of renewable energy

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International Journal of Science and Research Archive, 2024, 11(02), 1761–1764

Publication history: Received on 05 March 2024; revised on 17 April 2024; accepted on 20 April 2024

Article DOI: <https://doi.org/10.30574/ijrsra.2024.11.2.0668>

Abstract

Although awareness and preference for renewable energy is increasing, users still pay higher prices for renewable energy than for fossil fuels. Therefore, assessing renewable energy demand is necessary to find new opportunities and drivers from buyers in the upcoming flexible and competitive energy market in the context of social and environmental responsibility to enhance consumer market. A clear trend is taking place among electricity users and small-scale electricity generation investors. The development of decentralization in global power production and distribution is also quite similar to this trend. Although many of these studies have noted this trend, there are still limitations that have not been further clarified. One thing to note is that when people invest in renewable energy to make a profit, there may be some risks due to the incomplete legal and technical framework. For example, investors can ignore strict infrastructure standards, use cheap, low quality products or the ability to reduce subsidies and replace them with more market prices; Or they can aim to make a profit immediately. Therefore, people must pay attention and understand their intention to use renewable energy. This reduces business risk by supporting the development of financial and investment solutions for citizens. At the same time, setting standards and establishing a comprehensive communication plan will provide the basis and tools for the sustainable and effective development of renewable energy by the people.

Keywords: Renewable energy; Intention to use renewable energy; Khanh Hoa Province

1. Introduction

Renewable energy is energy derived from natural processes (such as sunlight and wind) that is replenished at a faster rate than it is consumed and is environmentally friendly. The advantage of renewable energy is to mitigate climate change, help protect ecosystems, create strong energy security benefits,... but it is unstable and concentrated. Low energy, requires high technology and high maintenance. The Vietnamese government has used the country's abundant fossil energy resources for economic development. Focusing only on fossil energy development further aggravates Vietnam's emissions, environmental pollution and climate change problems. Against this backdrop, Vietnam has identified targets for renewable energy by setting long-term targets for both energy generation and installed capacity additions. To achieve these goals, Vietnam has developed a development strategy and appropriate policy tools, but both steps have not yet been completed. Vietnam has legal provisions to promote hydroelectric energy and some regulations for wind energy technology, but there is no strategic or policy concept that allows for effective public support. other renewable technologies. Vietnam still places great importance on promoting fossil fuels, especially gas power generation. Vietnam's renewable energy policy still has limitations such as: incomplete policy framework; low electricity prices; Traditional energy is dominant and exclusive; Difficulty in accessing consumer markets; difficulty accessing financial resources; technology shortage and underdeveloped domestic production; environmental and social impact.

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2. A Brief History of Renewable Energy

Energy is needed in every business, in all sectors, and most businesses rely on non-renewable energy sources [1]. However, according to Jaiswal and Kant [2], fossil fuels used to produce non-renewable energy are increasingly scarce and in this situation, solar energy may be the best solution to meet both supply and demand ends. Renewable energy is non-fossil, renewable forms of energy, including: small hydroelectric sources, marine energy (electricity generation by ocean waves, tides, ocean current energy), energy wind, solar energy, geothermal energy; biomass energy and biofuels. Renewable energy is understood as energy sources or energy exploitation methods that, if measured by human standards, are limitless. Infinite has two meanings: (i) energy exists so much that it cannot be exhausted by human use (e.g. solar energy); (ii) short-term and continuous self-renewable energy (e.g. biomass energy) in processes that continue for a long time on earth.

Roger proposed a theory of innovation diffusion that explains how ideas and technologies are spread and accepted through five stages: cognitive stage; persuasion stage; decision-making stage; implementation phase and validation phase. Rogers also identified five innovation attributes as (1) relative benefits, (2) adaptability, (3) accessibility, (4) ease of experimentation, and (5) observability [3]. Davis built a technology acceptance model with the assumption that acceptance of a new technology model depends on the user's attitude, perceived usefulness and perceived ease of use [4]. The TAM model is quite commonly used for various studies in determining the acceptance trend of new technologies. Therefore, the research model is established based on innovation diffusion theory and technology acceptance model. Two new factors included in the newly built model are (1) cost and (2) policy to suit research conditions in Vietnam.

This research to learn about behavioral intentions as well as the tendency to consume a technology product should be based on two main theoretical models: TAM Technology Acceptance Model [4] and TPB Theory of Planned Behavior [5], and at the same time adding a few elements of other research in the same field of solar energy to suit the current situation of the Vietnamese market.

3. Related research

Research by Zhang et al [6] on Consumer awareness and usage intention towards solar power systems of people. Due to the importance of promoting renewable energy, the Chinese government has issued policies to encourage people to install and use distributed photovoltaic (PV) systems. However, only a few studies have investigated the factors that influence people's intention to use residential PV systems. Therefore, the present study investigated the influence of Chinese residents' environmental concern and innovativeness on their intention to use residential PV systems, as well as the intermediate effects. between the benefits and harms of the PV system to people in this process. In addition, the role of regulating the monthly electricity consumption of residents in the said association was also examined. Questionnaire data from 400 Chinese participants in Zhejiang province were used for analysis. Results from structural equation modeling show a positive association between environmental concern and intention to use, and between innovativeness and intention to use, through mediating benefits and impacts. perceived harm. Residents' monthly electricity consumption is also part of the association. Based on the results, this paper calls on the government to adjust the safety standards of PV people nationwide to enhance social trust. Conspicuous consumption, which comes with "traditional customs," should also be reduced.

Schulte et al. [7] study Meta-analysis of residential PV adoption: the critical role of perceived benefits, intentions, and antecedents in solar energy adoption. The adoption of residential photovoltaic (PV) systems is considered an important part of the sustainable energy transition. To facilitate this process, it is important to identify the factors that determine the use of solar energy. This article follows a meta-analytic structural equation modeling approach, presents a meta-analysis of studies on residential PV adoption intention, and evaluates four behavioral models based on behavioral theory. en plans to promote theoretical development. Of the 653 studies initially identified, 110 remained for full-text screening. Only eight studies were sufficiently homogeneous, provided bivariate correlations, and could therefore be integrated into the meta-analysis. Pooled correlations across the primary studies show moderate to large correlations between environmental concern, novelty seeking, perceived benefits, subjective norms, and intention to adopt the system. residential PV system, while sociodemographic variables were not correlated with intention. Meta-analytic structural equation modeling revealed a model ($N = 1,714$) in which adoption intention was predicted by benefits and perceived behavioral control ($R^2 = .280$) and vice versa , benefits can be explained by environmental concerns, novelty seeking, and subjective norms ($R^2 = .641$). Our results imply that measures should primarily focus on raising awareness of benefits. Based on the obstacles we encountered during our analysis, we propose guidelines to facilitate future

synthesis of scientific evidence, such as systematically including Systematize key variables and report on the correlation between the two variables.

Research by Elahi et al. [8] on Understanding farmers' intention and willingness to install renewable energy technology: Solutions to reduce agricultural emissions into the environment. Although Pakistan has the potential to produce solar energy, only a small percentage of the population uses solar technology in agriculture due to low public acceptance. This study aims to understand the social acceptance of Photovoltaic (PV) water pumps in rural Pakistan and farmers' willingness to pay more for green electricity. In 2021, cross-sectional data of 1200 farmers were collected from rural Punjab in Pakistan using a well-structured questionnaire. An extension of the Theory of Planned Behavior (TPB) was used to assess farmers' intention to install PV water pumps. The extended TPB model is compared with that of the original TPB and the Theory of Reasoned Action (TRA). Furthermore, a parametric econometric approach was used to estimate the determinants of farmers' willingness to pay more for green electricity. Comparing the models confirmed that the extended TPB model performed better than the alternative models as it was associated with lower values of Root Mean Square Error of Approximation and higher values of Comparative Fit Index. The results of path analysis show that the intention to install PV water pumps is positively associated with the coefficients of attitude towards environmental protection, subjective norms of sustainable behavior, lack of access to electricity, perceived behavioral control and relative advantage. The cost of a PV water pump is negatively related to farmers' intention to install it. The probability of being 'willing to pay more for green electricity' increases with people's education level, income and lack of access to grid electricity but decreases with age and the cost of green energy technology. The findings highlight that younger, more educated and wealthier farmers are more likely to adopt green energy. Lack of financial resources, availability of fossil fuel alternatives and lack of understanding of green energy technology are the main reasons for unwillingness to pay more for green energy. Unable to happen in resource-rich countries where people can afford expensive green energy, governments have until now had to support higher prices for green energy technology with subsidies in poor countries resources. Furthermore, providing awareness programs on the use of PV water pumps to rural residents can enhance public acceptance of this technology.

Wang et al. [9] study on The impact of personality traits on people's behavioral intention to save energy – An empirical study based on the theory of planned behavior in the West An. Individuals often show very stable differences in people's energy saving intentions. Personality traits are a possible explanation for such differences. However, the mechanism by which personality traits influence people's energy-saving intention remains unclear. This study aims to explore the role of personality traits in people's energy saving intention by connecting the Big Five personality traits with people's energy saving intention through Theory of Planned Behavior (TPB). The study used data from a survey in Xi'an, China, with a valid sample size of 279 residents. The analysis results show that, except for Extraversion, the remaining four personality traits affect people's energy saving intention through different mechanisms. Agreeableness and openness showed positive correlations with all three TPB predictors. Conscientiousness also showed a positive correlation with perceived behavioral control, whereas Neuroticism showed only a negative relationship with attitudes. This study combines personality traits with TPB to investigate people's energy saving intention. The results provide some empirical evidence on the relationship between personality traits and environmentally friendly behavior in northwest China. The findings of this study will contribute to environmentally friendly policy making for sustainable community development.

4. Conclusion

First, communicate the usefulness and ease of use of the technology. Propagate and disseminate knowledge about the usefulness and ease of use of solar power technology; organize seminars, workshops and training. The first propaganda is for civil servants, public employees, officials and businesses in the city. Then, solar power technology is discussed in terms of usefulness and ease of use. In addition, it is necessary to declare the importance of using renewable energy and developing it in the process of sustainable development for economic, social benefits and environmental protection so that everyone can carry out these actions. Practical actions to support development

Second, the risks caused by using solar power are reduced. Currently there are many domestic and international factories producing solar panels. Therefore, people who intend to invest in solar power (rooftops) often have difficulty choosing solar panels because there is not enough information to identify good products. The following information should be of interest to the public: (i) Proof of insurance issued by independent insurance companies In international trade, this must apply especially to high-tech products ; (ii) Solar panel manufacturers must have certificates that meet international standards IEC (International Electrotechnical Commission) and UL (Underwriters Laboratories Inc.). UL and IEC standards are very different. IEC standards define minimum safety levels for equipment.

Third, support the cost of investing in solar energy equipment for people. Rooftop power generation is facing many problems, including high investment costs and lack of information about product quality, construction units, installation, and operation and maintenance procedures. Authorities and management agencies in the coming time should propagate to all people about the financial benefits, usefulness, ease of use of technology and environmental friendliness.

Fourth, the law on electricity trading for people using rooftop electricity. Producing rooftop solar energy for people is one of the solutions that can reduce pressure on the electricity industry in the context that the electricity system is under a lot of pressure to ensure electricity supply, especially after 2020, when there is no new domestic exploitation source.

Compliance with ethical standards

Acknowledgments

I acknowledge the people who are using renewable energy in Khanh Hoa province - Vietnam for helping to understand the factors that determine people's use of renewable energy.

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