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Factors Affecting Attitude for Green Transformation Policy in Vietnam

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ABSTRACT: The Vietnamese government is interested in green energy transition through many international commitments to sustainable development. In the past time, the government of this country has developed many green energy transition policies. However, there is a lack of quantitative studies assessing the impact of this policy. To contribute to filling this gap, this study examines the influencing factors on the policy support attitude of the Vietnamese people. This study was conducted through a cross-sectional survey using Purposive Sampling (n=200). A multivariate linear regression analysis technique was applied to prove the hypotheses. The research results show that all three factors of awareness of economic benefits, perception of social benefits, and understanding of environmental benefits by green energy transition policies have positive and significant impacts on the environment policy support. Among them, the perceived factor of economic benefits has the most substantial effect. This study implies that the Vietnamese government needs to communicate the help of the green energy transition policy to the people in the coming time.

KEYWORDS: green energy; economic efficiency; social efficiency; environmental efficiency; policy attitude.

INTRODUCTION

Green energy is essential for sustainable development, and the optimal selection of green energy sources remains a significant challenge for developing and developing countries (Iddrisu & Bhattacharyya, 2015). Green energy is generated from sustainable natural resources and non-fossil energy sources, such as solar, wind, hydro, biomass, geothermal, and solar power. These are energy sources that can be regenerated after a while. Humanity is witnessing a transition to a clean industrial civilization (Leggewie & Messner, 2012). The clean industry is a new sustainable development policy model that is a planned, policy-driven process (Schmitz, Johnson, & Altenburg, 2013).

The goal of the green energy transition model is that the transition towards a sustainable, low-carbon global economic system needs to be fundamental (Holstenkamp & Radtke Eds., 2017). The core of the transformation of the green energy model is profound innovation of economic structure, technology, and institutions. The energy sector plays a central role, responsible for government intervention as the driving force behind the green energy transition (Lederer, Wallbott, & Bauer, 2018). This is a particularly challenging task because market failures in limiting polluting technologies and excluding sustainable ones are numerous and particularly important (Altenburg & Pegels, 2012; Lutkenhorst, Altenburg, Pegels, & Vidican, 2014).

The Vietnamese government is very interested in green energy development. The evidence is that in the past, the Government of Vietnam has developed synchronous and consistent policies prioritizing the efficient use of green energy in association with the development of the renewable energy industry, limiting the investment in more power plants. Fossil fuel generators. Vietnam has 70 wind power projects (with a capacity of 3,987 MW) already in commercial operation; the electricity output in 2021 will reach 3.34 billion kWh, accounting for 1.3% of the total electricity output of the whole system. Regarding solar power, the electricity output from solar power sources in 2021 alone accounts for about 10.8% of the total electricity production of the entire system. The full installed capacity of biomass and garbage electricity will be 321 MW by October 2021. Vietnam has made strong commitments to respond to climate change, aiming for net zero emissions by 2050 at COP26. The latest Power Plan 8, submitted to the Government by the Ministry of Industry and Trade, predicts the maximum capacity (Pmax) in 2025 to reach about 59,300-61,400 MW; in 2030 is about 86,500-93,300 MW; year 2045 is about 155,000-189,900 MW. On that basis, this Ministry has proposed to select the planning option for the total power capacity of about 146,000 MW by 2030 and about 343,000 MW by 2045 (excluding the existing rooftop solar power source of about 7,755 MW and power sources for separate loads are about 2,700 MW in 2030 and 4,500 MW in 2045) (Luong Bang & Kien Trung, 2022).

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Many studies have been developed using a variety of policy models and frameworks that address the issues of green energy source selection and sustainable development for a cleaner future (Zhang et al., 2016). Many qualitative studies have shown that the reality of the green energy transition in Vietnam is still full of challenges, such as existing policies that have created conflicts over land, inequalities in livelihoods, and inequalities in legal opportunities. New cooperation of people and community groups. The energy transition in Vietnam will require a comprehensive approach with the participation of all economic sectors in society, along with many synchronous solutions (Khac Kien, 2022; Nghi, Thu, & Palace, 2022).

LITERATURE REVIEWS

The role of green energy transition policy

The policy of diversifying green energy sources is critical, especially given the depletion of fossil fuels in both developed and developing countries. To achieve cleaner energy production in the future, there can be many different factors; environmental, social, economic, technical, and institutional aspects should be used as benchmarks for sustainable energy planning (Al Garni et al., 2016). Green energy is an essential input from the economic and human welfare perspective to build a common sustainability framework for a cleaner future (Iddrisu & Bhattacharyya, 2015). Technology plays a vital role in modern society in choosing green energy sources. With the development of new capabilities, technology also creates unknown risks to the surrounding environment depending on the mode of interaction (Yi, Sin, & Heo, 2011). Therefore, selecting optimal sources is one of the foremost vital things to steer the world toward social and environmental sustainability (Janeiro & Patel, 2015).

Green energy transition policy in Vietnam

Vietnam is taking the first steps in transitioning from traditional energy to green and cleaner renewable energy. This is also an inevitable trend to help ensure a sustainable economy. The proliferation of new power sources exposes the system to sustainability and stability challenges, requiring coordination of both policy and technology to provide reliable power (Vu Dung, 2022; Chien & Thanh, 2022). The policy of green energy transition in Vietnam kicked off when the Prime Minister of Vietnam issued Decision No. 2068/QD - TTg dated November 25, 2015, approving Vietnam's Renewable Energy Development Strategy until 2020. 2030, with a vision for 2050. In the following years, the Prime Minister of Vietnam also issued many green energy transformation decisions, such as Decision No. 39/2018/QD-TTg dated September 10, 2018; National electricity development planning period 2021 - 2030, vision to 2045; Decision No. 1264/QD-TTg dated October 1, 2019, on the National Energy Master Plan for the period of 2021 - 2030, with a vision to 205; The Politburo of the Communist Party of Vietnam also issued Resolution No. 55 - NQ/TW dated February 11, 2020, on orientations of Vietnam's national energy development strategy to 2030, with a vision to 2045. (Politburo, 2020; Thomas Kirchhoff, 2014; Prime Minister, 2019a; 2019b; 2018).

Vietnam is taking the first steps in transitioning from traditional energy to green and cleaner renewable energy. The change will bring many opportunities to develop a sustainable green economy but poses significant challenges (Thuy Linh, 2022). In addition to the favorable factors, Vietnam must also implement solutions to solve the difficulties and challenges in ensuring energy security to minimize the environmental impacts of power generation activities. Furthermore, load growth at a high rate puts pressure on the energy industry's infrastructure, requiring significant investment capital and complex technical solutions (Pham Tuyen, 2022).

People's attitude towards transition policy

The impact of people's attitudes on policy is not new (Cochrane, 2015; Luo & Zhao, 2019). Policy development should refer to people's attitudes about the procedure (Sovacool, 2014). People's attitudes depend on fundamental values and beliefs that are general, enduring principles that individuals hold about desired outcomes or ways of life (Rokeach, 1973). They are deeply stored, stable over time, and found in similar forms in different cultures (Schwartz & Bilsky, 1987), and it leads to likes and dislikes for objects or specific policies (Rokeach, 1973).

Specific attitudes derived from values and beliefs highlight the relative importance that someone places on some issues over others (Gidengil et al., 2012). Therefore, the policy should refer to political orientations based on social group membership (Converse, 1964). Membership in a politically prominent group serves as an experience that helps someone decide whether to support a policy, primarily if their values and beliefs do not address the issue. On that topic, or they lack a consistent belief system (Campbell et al., 1960), through viewing policies through the lens of group interests (Converse, 1964), or through symbolic alignment of the effect of specific policies on specific groups (Conover & Feldman, 1981). People's attitudes about a particular policy depend on their social background, including personal characteristics such as gender, age, socioeconomic status, education, urban, rural, etc. (Brulle et al., 2012; Lee et al., 2015; Scannell & Gifford, 2013).

From the literature reviews, the authors have built a research model about what, as shown in Figure 1 below:

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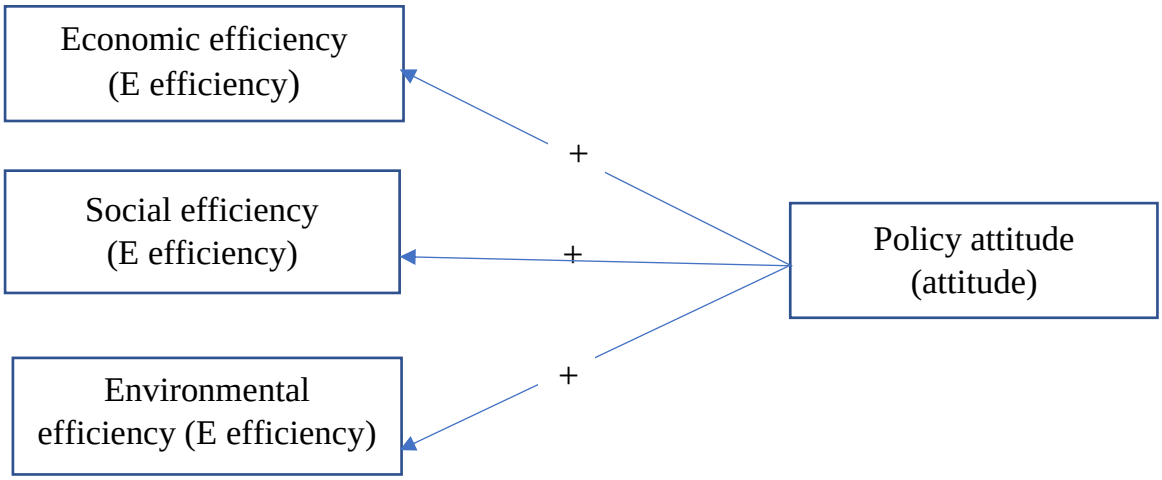

Figure 1. The Research Model

HYPOTHESES

Based on the above documents, the following hypotheses have been formed:

H1. People's perception of the economic efficiency of green energy policy positively and significantly impacts their attitude toward the green energy policy transition.

H2. People's awareness of the social benefits of green energy policy has positive and significant impacts on the attitude toward green energy policy transformation.

H3. People's awareness of the environmental benefits of green energy policies has positive and significant impacts on the attitudes toward green energy policy transformation.

RESEARCH METHOD

The study was conducted in Phu Yen Province and Quang Tri Province in September 2022. Phu Yen province has the largest Green Energy Urban Area in Vietnam, and Quan Tri province has the largest wind power project in Vietnam. These two provinces lead the country in green energy development. The research team used in-depth interviews with psychologists, economists, and environmental researchers to adjust the research scale and improve the questionnaire to suit the characteristics of the survey area. Close. The questionnaire was built based on the results of the research overview and experts' comments. It consists of 2 parts. Part 1 collects information about the demographics of the study participants, such as age, gender, and education level. Part 2 contains information about research participants about their perception of economic benefits, social benefits, environmental benefits, and their supportive attitude toward the government's green energy transition policy. Government of Vietnam (Table 1). The 5-point Likert scale was applied to build the questionnaire (Joshi, Kale, Chandel, & Pal, 2015).

After discussion and finally consensus among researchers, a preliminary questionnaire was created. A language expert then contributed to this version to create the final version. After that, this version was pre-tested on 40 demographically representative people by age, gender, education, and occupation. This was followed by minor tweaks made to improve the question structure to make the questionnaire easier to understand for formal surveying.

Table 1. Items in the questionnaire

Items	Factors
E_efficiency	**The level of awareness about the impact of the policy on the economic landscape**
E_efficiency1	Ensure fast economic development
E_efficiency2	Ensure stable economic development
E_efficiency3	Guaranteed economic safety
E_efficiency4	Create a change in consumption that does not harm biodiversity and the environment
E_efficiency5	Creating equality in access to resources
E_efficiency6	Hunger eradication and absolute poverty alleviation
S_efficiency	**Clean technology and industrial ecology**
S_efficiency1	Gradually reduce consumption of energy and other resources through eco-technology and lifestyle changes

S_efficiency2	Create jobs for your locals
S_efficiency3	Increase income for your local workers
S_efficiency4	Promote full access to basic services in your local area
S_efficiency5	No harm to the economy and the environment
S_efficiency6	Create more jobs for you
Ev_efficiency	**Awareness of the policy's impact on environmental sustainability**
Ev_efficiency1	Rational use of natural resources
Ev_efficiency2	Overexploitation of renewable resource systems
Ev_efficiency3	Maintain biodiversity
Ev_efficiency4	Limit the problem of environmental pollution including urban and industrial pollution
Ev_efficiency5	Good management and treatment of solid waste and hazardous waste
Ev_efficiency6	Prevent and mitigate the effects of climate change and natural disasters
Ev_efficiency7	Atmospheric stability and other ecological activities
Attitude	**Policy attitude**
Attitude1	I'm interested in green energy transition policy
Attitude2	I support the green energy transition policy
Attitude3	I will support my organization to participate in the policy if possible.
Attitude4	I encourage others to get involved in the policy.

The questionnaire was sent directly to the respondents by purposeful sampling method. As a result, 200 satisfactory votes were obtained, achieving a response rate of 100%. Demographic information of study participants (Table 2).

Table 2. Demographic characteristics of survey participants

		Education							
		Bachelor		College		Master		Ph.D	
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %
Gender	Female	17	53.1%	8	25.0%	3	9.4%	4	12.5%
	Male	58	49.2%	24	20.3%	20	16.9%	16	13.6%
Age	<30 years old	3	25.0%	2	16.7%	4	33.3%	3	25.0%
	>55 years old	5	55.6%	2	22.2%	2	22.2%	0	0.0%
	31-35 years old	31	46.3%	15	22.4%	10	14.9%	11	16.4%
	36-40 years old	8	34.8%	6	26.1%	4	17.4%	5	21.7%
	41-45 years old	14	82.4%	2	11.8%	1	5.9%	0	0.0%
	46-50 years old	8	66.7%	2	16.7%	1	8.3%	1	8.3%
	51-55 years old	6	60.0%	3	30.0%	1	10.0%	0	0.0%

RESEARCH RESULTS (KẾT QUẢ NGHIÊN CỨU)

R Programming is used to analyze the reliability of the scale, exploratory factor analysis, and regression analysis.

Reliability analysis

Cronbach's Alpha coefficient has a variable value in the interval [0,1]. If a measurement variable has a total correlation coefficient of Corrected Item - Total Correlation ≥ 0.3, then that variable meets the requirements (Cronbach, 1951; Taber, 2018). The verification criterion is that Cronbach's Alpha coefficient must be greater than 0.6, and the correlation coefficient of the sum variable in each scale must be greater than 0.3 (Hair, Black, Babin, & Anderson, 2010). Table 3 shows that the rankings of the factors are all standard. Therefore, all the items are reliable and used for subsequent factor analysis.

Table 3. Reliability analysis

Scales	Number of variables observed	Reliability coefficients (Cronbach Alpha)	The correlation coefficient of the smallest total variable
E_efficiency	8	0.891	0.648
S_efficiency	6	0.833	0.551

Ev_efficiency	7	0.856	0.538
Attitude	4	0.782	0.667

Factor analysis

After testing Cronbach's Alpha, the author uses exploratory factor analysis (EFA) to preliminary evaluate the scales' unidirectional, convergent and discriminant values. EFA was used by extracting the Principal Components Analysis Factor and Varimax rotation to group the factors. With a sample size of 200, the factor loading of the observed variables must be greater than 0.5; variables converge on the same factor and are distinguished from other factors. In addition, the Kaiser-Meyer-Olkin coefficient (KMO), which is an index used to consider the adequacy of factor analysis, must be in the range of $0.5 \leq KMO \leq 1$ (Cerny & Kaiser, 1977; Kaiser, 1974). The analysis results in Table 3 show that all factor loading coefficients of the observed variables are greater than 0.5, Bartlett test with sig. = 0.000 with KMO coefficient = 0.936. All 25 items in the EFA analysis were extracted into 4 factors with Eigenvalues greater than one and Cumulative variance percent = 0.570.8%. Thus, the research model consisting of 3 independent and 1 dependent variable is used for linear regression analysis and subsequent hypothesis testing.

Table 3. Rotated Component Matrix

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
E_efficiency5	.707			
E_efficiency3	.669			
E_efficiency4	.662			
E_efficiency7	.654			
E_efficiency1	.648			
E_efficiency6	.629			
E_efficiency8	.596			
E_efficiency2	.588			
Ev_efficiency3		.709		
Ev_efficiency4		.677		
Ev_efficiency7		.673		
Ev_efficiency1		.637		
Ev_efficiency6		.616		
Ev_efficiency5		.607		
Ev_efficiency2		.582		
S_efficiency4			.737	
S_efficiency5			.685	
S_efficiency6			.665	
S_efficiency3			.649	
S_efficiency1			.575	
S_efficiency2			.559	
Attitude2				.766
Attitude4				.671
Attitude3				.621
Attitude1				.613
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Extraction Sums of Squared Loadings =0.570				
a. Rotation converged in 6 iterations.				

Pearson correlation analysis

The author uses Pearson correlation analysis to analyze the correlation between quantitative variables. Figure 2 shows that, at the 5% significance level, the correlation coefficient indicates that the relationship between the dependent and independent variables is statistically significant (Sig. < 0.05). The magnitude of the correlation coefficients ensures that multicollinearity does not occur. Therefore, other statistics can be used to verify the relationship between the variables.

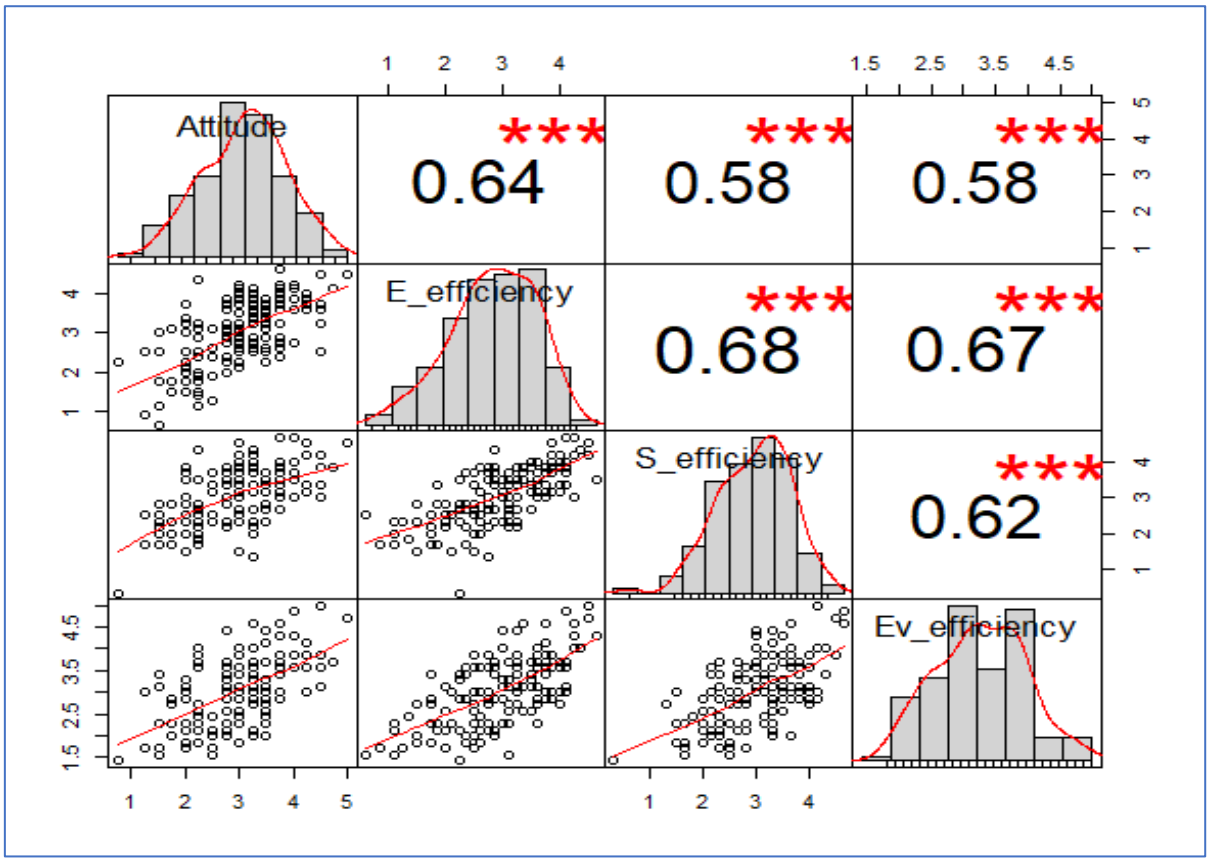

Figure 2. Pearson correlation analysis results

Linear regression analysis

Next, the author conducts multivariable linear regression analysis on the relationship between three independent variables, E_efficiency, S_efficiency, Ev_efficiency, and a dependent variable, Attitude. Table 4 shows that the regression model has R2 = 0.470. This result indicates that the built linear regression model fits the data set = 0.470 %. Thus, all three independent variables have a statistically significant impact on the dependent variable. With the coefficient of VIF of 3 independent variables < 2.28, the ANOVA test of the model has a significant level of 95% (p.value = 0.000). This result shows that the regression model is valid in explaining the study results (Hair, Black, Babin, & Anderson, 2010).

Table 4. The results of multiple linear regression analysis

	Dependent variable:
	Attitude
E_efficiency	0.356***
	(0.089)
S_efficiency	0.209**
	(0.090)
Ev_efficiency	0.223**
	(0.090)
Constant	0.606***
	(0.222)

Observations	150
R2	0.470
Adjusted R2	0.459
Residual Std. Error	0.601 (df = 146)
F Statistic	43.175*** (df = 3; 146)

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Note: *p<0.1; **p<0.05; ***p<0.01

Table 5 shows that, with 95% confidence, the hypotheses proposed by the research team are accepted. Specifically, the variable E_efficiency has the most potent effect on the Attitude variable with β = 0.356 (p.value = 0.000), the second is the Ev_efficiency variable with β = 0.223 (p.value = 0.001), and the lowest is the S_efficiency variable with β = 0.209 (p.value = 0.001). Furthermore, this result shows that if other conditions are excluded, the increase or decrease of the variables E_efficiency, S_efficiency, and Ev_efficiency both positively and significantly affect the dependent variable Attitude.

DISCUSSION AND CONCLUSIONS

Firstly, the research results (Table 4) show that people's awareness of the economic benefits of green energy policies positively and significantly impacts attitudes toward a green energy policy transition. With this result, hypothesis H1 is accepted. The results of this study are similar to the findings of previous studies that the green energy transition policy receives support from the people because it is related to sustainable development (Ukaga, Maser, & Reichenbach, 2011; Basiago, 1999). The green energy transition policy is committed to improving and maintaining a healthy economy and ecological and social systems for human development (Grey & Milne, 2013; Tjarve & Zemīte, 2016).

Secondly, the research results (Table 4) show that people's awareness of the social benefits of green energy policies has a positive and significant impact on favoring the transition of green energy policies. With this result, hypothesis H2 is accepted. This result supports the view that a green energy transition policy is associated with sustainable development. The social benefits of the community are derived from the efficient and equitable distribution of resources within and between generations with the operation of socio-economic activities within the limits of an ecosystem. finite state (Mensah & Emu-Kwesi, 2018; Thomas, 2015; Stoddart, 2011).

Thirdly, *the r*esearch results (Table 4) show that people's awareness of the environmental benefits of green energy policies has a positive and significant impact on the attitude of favoring a green energy policy transition. With this result, hypothesis H3 is accepted. This finding further supports previous findings that most policy tools are used today to guide economic activity toward environmental sustainability, such as regulation, subsidies, and environmental sustainability. And tax incentives are familiar with industrial policy. This is not unreasonable; the industrial approach has been used for decades to initiate and facilitate structural change (Chaudhary, Narain, Krishnan, & Sagar, 2014; Dai & Xue, 2015); Morris & Martin, 2015; Schmitz, 2017; Shen, 2016). The environmental benefits brought about by the green energy transition policy are reflected in the procedure of satisfying the needs and desires of local people without depleting or depleting production resources (Thomas, 2015).

Fourthly, the research results support the view that economic efficiency, social efficiency, and environmental performance are the three main factors affecting the support for the national green energy transition policy. The three main sustainable development issues are economic growth, environmental protection, and social equality. On this basis, it can be argued that the concept of sustainability rests on three conceptual pillars. These pillars are “economic sustainability,” “social sustainability,” and “environmental sustainability” (Taylor, 2016). Thus, the role of government is to not only play a more active role in guiding the market but also in providing additional and fundamental new policy instruments (Altenburg & Lutkenhorst, 2015; Johnson, Altenburg, & Schmitz, 2014; Pegels, 2014; Rodrik, 2013; Schmitz et al., 2013; Hallegatte, Fay, & Vogt-Schilb, 2013; Altenburg & Assmann, 2017).

Finally, the results of this study imply that developing a national green energy transition policy requires the participation of a third party. It would be impractical for the government to trigger green energy development alone. It should have a role in leading social forces in green energy development Smith, Sterling, & Berkhout (2005). The Vietnamese government should play a controlling position in management, taxation, subsidies, or investment. However, in addition to the government, some factors have changed the policy of green energy development. These groups of actors may be in favor of or against the policy change. The government, therefore, mobilizes these forces (Love, Mickwitz, & Heiskanen, 2011; Schmitz, 2017; Hess, 2014). The role of the Vietnamese government stems from non-economic actors related explicitly to the development of green energy (Newell & Paterson, 2010), reflected in the decision-making framework of stakeholders. Participation, shifting incentives, and capital allocation to redistribute profit opportunities and share responsibilities (Krueger, 1974; Tullock, 1967).

LIMITATIONS

As with other empirical studies, there are limitations to this study that should be considered when discussing the results. First, our survey method reflects the subjective perception of the respondents toward the questions being investigated. Subjective data has some inherent disadvantages that are hard to avoid in surveys (Thanh, Tung, Thu, Kien, & Nguyet, 2021). Our data is collected over a single period. Cross-sectional data do not allow a dynamic assessment of changes in students' intentions and related behaviors regarding their college admissions, which may affect their applicability (Xin, Liang, Zhanyou, & Hua, 2019). Future research should combine cross-sectional analysis and long-term research.

The purposeful sampling method has certain limitations, not fully reflecting population characteristics (Strong et al., 2018). Our survey was conducted in a Vietnamese political and cultural context and therefore requires more general statements than can be made by applying the development research model and research conclusions to other countries and cultures (Sun et al., 2012; Thanh, Hiep, & Tung, 2021). Future research should also include moderating variables such as ethnicity, ethnicity, religion, and occupation differences. The coefficient of determination R2 of the model is still low ($R^2 = 0.487 < 0.50$), leading to a decrease in the significance of the model. In future studies, it is necessary to increase the sample size to improve the model.

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CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

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