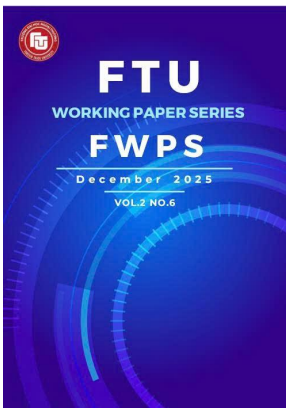

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FACTORS INFLUENCING PUBLIC ATTITUDES TOWARD ELECTRIC VEHICLE POLICIES: THE CASE OF HANOI UNDER THE FOSSIL-FUEL VEHICLE BAN

Nguyễn Thị Minh Hằng[1], Trần Lâm Huy, Đoàn Minh Khuê, Hà Phương Uyên, Nguyễn Phạm Ngọc Hà, Nguyễn Minh Anh, Nguyễn Diễm Hằng

Sinh viên K63 – CLC Kinh tế đối ngoại – Viện Kinh tế và Kinh doanh quốc tế

Trường Đại học Ngoại thương, Hà Nội, Việt Nam

Nguyễn Thị Bình

Giảng viên Viện Kinh tế và Kinh doanh quốc tế

Trường Đại học Ngoại thương, Hà Nội, Việt Nam

Abstract:

This study aims to investigate factors influencing public attitudes toward EVs-supporting policies in the context of Hanoi with an impending fossil-fuel vehicle ban. The research team utilized an extension of Technology Acceptance Model (TAM) as the conceptual framework, and empirically tested this model's hypotheses using partial least squares structural equation modeling, sample descriptive statistics and the data collected from 221 respondents in Hanoi, Vietnam during September 2025. The results disclosed that factors significantly affecting public attitudes included perceived policy effectiveness

[1] Corresponding authors, Email: k63.2412150103@ftu.edu.vn

and perceived policy accessibility; while perceived affordability showed little impacts on public acceptance. Understanding factors influencing public attitudes toward EV-supporting policies may aid in improving the policy-making process. Specifically, policymakers should focus on policy design with transparency, fairness, and comprehensiveness. This study differs from previous research by considering factors affecting public acceptance toward EV-supporting policies when a fossil-fuel vehicle ban is planned to be implemented in Hanoi.

Keywords: EVs-supporting policies; fossil-fuel vehicle ban; Hanoi; TAM; public attitudes; PLS-SEM

CÁC YẾU TỐ ẢNH HƯỞNG ĐẾN THÁI ĐỘ CÔNG CHÚNG ĐỐI VỚI CHÍNH SÁCH XE ĐIỆN : TRƯỜNG HỢP CỦA HÀ NỘI DƯỚI CHỈ THỊ CẤM XE XĂNG

Tóm tắt

Bài viết nghiên cứu những yếu tố ảnh hưởng đến thái độ công chúng đối với chính sách xe điện trong bối cảnh Hà Nội chuẩn bị thực thi chính sách cấm xe xăng. Nhóm nghiên cứu đã mở rộng mô hình chấp nhận công nghệ (Technology Acceptance Model - TAM) và kiểm định các giả thuyết, sử dụng mô hình phương trình cấu trúc bình phương tối thiểu từng phần (PLS-SEM), thống kê mô tả và dữ liệu thu thập từ 221 người ở Hà Nội, Việt Nam trong tháng 9 năm 2025. Kết quả cho thấy yếu tố ảnh hưởng đáng kể tới thái độ công chúng bao gồm nhận thức về hiệu quả chính sách và nhận thức về mức độ tiếp cận chính sách; trong khi đó, nhận thức về khả năng chi trả được chứng minh có tác động yếu. Hiểu về những yếu tố ảnh hưởng đến thái độ công chúng đối với chính sách xe điện hỗ trợ quá trình xây dựng chính sách. Cụ thể, người làm chính sách nên tập trung xây dựng chính sách minh bạch, công bằng và phổ quát. So với những nghiên cứu trước, bài viết này xem xét đầy đủ hơn các yếu tố tác động đến thái độ công chúng với chính sách xe điện khi lệnh cấm xe xăng dự kiến thực thi tại Hà Nội.

Từ khóa: chính sách xe điện, cấm xe xăng, Hà Nội, TAM, thái độ công chúng, PLS-SEM

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1. Introduction

1.1. Rationale of study

Along with the economic rapid growth, Viet Nam has to encounter serious challenges about environment and sustainability. Ha Noi - the capital of Viet Nam - is now one of the

most polluted cities in the world (Hien *et al.*, 2020). In order to address those situations, the Vietnamese Government has been introducing a new directive from the Prime Minister that all fossil fuel - powered motorbikes and mopeds will be banned from areas within Hanoi's Ring Road 1, starting July 1st, 2026.

The Government also instructed Ha Noi to gradually implement policies to support the use of environmental - friendly vehicles, especially electric vehicles (EVs). These efforts are hoped to make an impact on the serious reality of air quality in Ha Noi. However, residents still express controversial opinions surrounding these new policies (Kieu *et al.*, 2024). With over 6.7 millions off two – wheeled vehicles, Ha Noi is now overreliant on the use of motorcycles (Trung Phuong *et al.*, 2024). The policies propose an upheaval to daily lives of Hannoians. Therefore, to effectively implement policies, public opinion is a significant determinant that should be investigated (Drews and Van Den Bergh, 2016).

Although further studies have investigated the citizens' opinions toward these policies, there are still considerable features that should be taken into consideration. Those remaining factors are the motivations for the authors to investigate the influences on attitude toward EV policies.

1.2. Research Objectives and Questions

The research objectives of this study are:

RO1: To measure factors shaping public acceptance of EV policies and ICE vehicle bans simultaneously.

RO2: To provide policy implications for enhancing public acceptance and promoting EV adoption.

To achieve the aforementioned objectives, this study focuses on answering the following research questions:

RQ1: Which factors most strongly influence attitudes and adoption intention in this dual-policy context?

RQ2: What are the implications for policy-makers in Vietnam?

The remainder of this paper is divided into five sections. Section 2 synthesizes the existing literature and decides the theoretical framework of this research. Section 3

illustrates the data collection process and data analysis methods. In the fourth section, the results are presented, and then Section 5 discusses the findings in detail. The final section includes conclusions and future research directions.

2. Literature review

2.1. Electric vehicle policies; Fossil-fuel vehicle ban

EVs are defined as vehicles that have one or more electric motors, and an electric energy supply system for vehicle propulsion (Eisenmann, Görges and Franke, 2021). Research on EV policies in developed countries shows that EV adoption rates significantly depend on government incentives such as financial incentives, technology help, and infrastructure development (Zhang *et al.*, 2014). In contrast, developing ones are faced with several challenges such as inadequate infrastructure, technology gaps, and sometimes the financial challenges of EVs (Hidayat and Cowie, 2023; Pamidimukkala *et al.*, 2023).

Fossil-fuel vehicles are transportation modes that transform fossilized biomass into useful energy through a system of internal combustion engines (ICE), in the process also emitting carbon dioxide into the atmosphere that causes environmental pollution (Dinçer and Zamfirescu, 2011). Starting from the Paris Climate Agreement, several nations have pledged the phasing out of the sales of ICE vehicles, yet little legislative and actual actions have been made (Burch and Gilchrist, 2020).

2.2. Factors affecting public attitude towards EV policies

Factors influencing attitudes toward EV adoption are found in some current literature; whereas, direct studies on attitudes toward EV policies are still lacking. First, Ale (2024) shows that environmental concerns are important drivers of EV adoption. Yet the relationship is complicated as in different contexts, environmental consciousness can have detrimental impacts on EV purchase intentions among auto-dependent consumers (Liu, Sato and Morikawa, 2015). Second, it has been demonstrated that policy changes significantly affect the attitudes and intentions of consumers. In the Chinese context, preferential policies, as opposed to financial incentives, show greater effects on purchase intentions (Ehsan *et al.*, 2024). Third, peer pressure, perceived safety, and government subsidies all play a role in adoption decisions (Kukreja, 2025). Nevertheless, attitudes towards EV adoption may not equate to EV policies as the reactions to policies may be

affected by the nature of policymaking process or public trust, indicating the lack of the current literature on EV policies.

In Vietnam, according to Motorcycle Data, in the first 6 months of 2025, approximately 209.000 electric bikes were consumed (Xuyen, 2025). During the same period, VAMA shows that more than 163.000 electric cars were sold (Ha, 2025). However, there exist many barriers to further growth including battery, pollution, traffic accidents, lack of charging infrastructure, and gaps in policy effectiveness (X. Nguyen & Q. Nguyen, 2015). Rather than purchasing subsidies or charging station development incentives, users express a stronger preference for operating subsidies, such as lower electricity rates and road-use tax reductions (Truong, 2023). These results indicate that Vietnam's electric vehicle transition requires overall policy reforms focused on operational support and fossil fuel subsidies.

2.3. Factors affecting public attitude towards fossil-fuel vehicle ban

For the few countries that do have an ICE vehicle ban proposed and tested, the focus has consistently been the gradual transition from ICE vehicles to EVs (Torné and Trutnevyte, 2024). Leading countries and regions in the ban of ICE vehicles are China, the European Union, and the Nordic nations (Burch and Gilchrist, 2020). Research based in these countries have found that various factors, including but not limited to financial incentives, public policy and environmental awareness, EV supporting infrastructure, subjective norms, and psychological norms, have influence on public attitude towards banning ICE vehicles (Dong *et al.*, 2022; Zhang and Dong, 2023). It should be noted that these researches specified the findings to the context of their given geographical locations which were mostly metropolises with highly developed public infrastructure and overall economy. Therefore, the applicability of these findings into the context of developing and underdeveloped nations including Vietnam is still questionable.

In Vietnam, before the introduction of an ICE-free zone policy in Hanoi, research into banning ICE vehicles or related topics has been limited to the study of the adoption of EVs as an alternative (Tuan *et al.*, 2022; National Academy of Public Administration, Vietnam and Thanh, 2023). Notably, the work of Kieu *et al.* (2023, 2024) is found to be the most directly relevant literature on the topic of banning ICE vehicles in Vietnam. Their research concludes that socioeconomic status, public transport perception, motorbike dependency, and automobile affinity, along with psychological reasons, play a

significant role in shaping public attitudes. However, one of the limitations of their study is the fact that the public was not yet introduced to the ban of ICE vehicles. Moreover, new technological advances in EV adoption and progress made in the public transport system (new metro lines, improved road planning), along with the marketing efforts of EV brands, may suggest changing public attitudes.

2.4. Research gaps

The studies on EV policies and ICE bans were lacking in both quality and quantity. Most EV studies focused on EV adoption (Ehsan *et al.*, 2024; Kukreja, 2025), while studies on ICE bans either lacked the necessary applicability to the Vietnamese context (Torné and Trutnevyte, 2024) or were not adequately meaningful in the new context of changing public mentality (Kieu *et al.*, 2023, 2024).

Another gap is that the study on banning ICE vehicles and implementing EVs has been mostly separated contextually. This gap is noticeable in both the global state of art (Park, Lim and Cho, 2018; Dong *et al.*, 2022; Brand and Anable, 2019; Hoppe, Patt and Tröndle, 2023) and Vietnam (Tuan *et al.*, 2022; Kieu *et al.*, 2023, 2024; National Academy of Public Administration, Vietnam and Thanh, 2023; Vu Thi, Nguyen Thanh and Vu Trong, 2024). In developing nations like Viet Nam, this gap is even more critical due to insufficient previous literature on either topic.

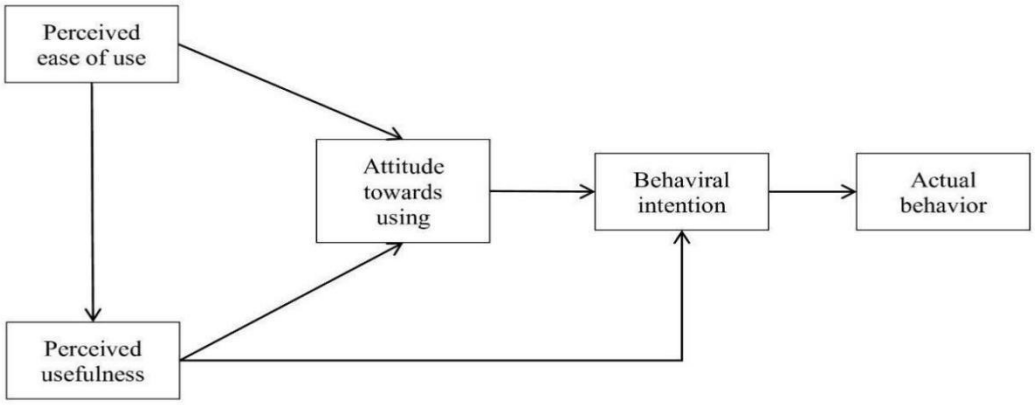
This study aims to address these gaps in the literature by studying factors shaping public attitude towards EVs policies in the context of a ban on ICE vehicles and analyzing data from people in Hanoi, Vietnam as empirical evidence.

3.Proposal of Conceptual Framework

3.1. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is regarded as one of the most prominent frameworks for examining the factors influencing the adoption of information systems and information technology through four fundamental constructs: Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitude (ATT), and Behavioral Intention (Figure 1).

Figure 1. The TAM model



Source (Davis, 1989)

Within this model, perceived usefulness (PU) and perceived ease of use (PEOU) are proposed and have been empirically validated as core predictors of users' acceptance of a particular innovative technology (Chau, 1996). Perceived Usefulness (PU) is defined as the extent to which use of the technology will increase an individual's productivity (Davis, 1989). PU has a direct positive influence on both Attitude toward Using and Behavioral Intention to Use. This means that when users perceive a system as beneficial to their work or daily life, they tend to form a favorable attitude toward it and are more willing to use it. Meanwhile, Perceived Ease of Use (PEOU) is known as the degree to which the use of the technology is supposed to be effortless and easy (Venkatesh and Davis, 2000). PEU directly affects both Perceived Usefulness and Attitude toward Use. Moreover, PEU indirectly influences Behavioral Intention to Use through PU and ATT. This implies that the easier a system is to use, the more useful and favorable it appears to users, leading to stronger intentions to adopt it.

Attitude toward Using (ATT) is defined as the individual's positive or negative feelings about performing the target behavior (Teo, 2009). In TAM, attitude represents the affective evaluation that links beliefs (PU and PEU) with behavioral intentions.

Behavioral Intention (BI) refers to the degree to which a person has formulated conscious plans to perform or not perform some specified future behavior (Miniard and Cohen, 1981). According to TAM, users who believe a technology is useful and hold a positive attitude toward it are more likely to develop a strong intention to use it.

3.2. Research Model

Recognized for TAM's strength in succinctly connecting beliefs with attitude, TAM has been widely employed by scholars to examine technological adoption across diverse contexts (Hubert *et al.*, 2017). According to previous studies, TAM was intensively utilized to predict public attitudes toward electric vehicle (EV) adoption (Chanda *et al.*, 2024). Given the model's stronger explanatory power, this paper employs a version of TAM with the removal of Behavioral Intention (BI) because the study's context focuses on understanding public attitudes toward electric vehicle (EV) policies in Hanoi under a fossil-fuel vehicle ban. Moreover, the two variables Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) have been relabeled, while their underlying essence remains unchanged, in order to enhance their suitability for analyzing public attitudes toward electric vehicle support policies.

3.2.1. Perceived Policy Effectiveness (PPE)

Perceived Usefulness (PU) is reframed as Perceived Policy Effectiveness (PPE), which reflects an individual's favourable or unfavourable evaluation on the clarity, adequacy and facilitation of policy (Wan, Shen and Yu, 2014). In the context of electric vehicle support policy, PPE refers to the extent to which citizens believe that EV policies can achieve their intended goals, such as reducing air pollution, mitigating climate change, and promoting sustainable transportation. As reported by (Wang *et al.*, 2021), Perceived Policy Effectiveness positively influences public attitudes. Based on this, the following hypothesis is formed:

H1: Perceived policy effectiveness positively influences public attitude towards EV-supporting policies

3.2.2. Perceived Policy Accessibility (PPA)

PEOU is adapted into Perceived Policy Accessibility (PPA), which refers to the degree to which people find electric vehicle policies understandable, feasible, and easy to follow in practice. This includes factors such as the clarity of regulations, equity of access (Morais, 2023), and availability of charging infrastructure (Falchetta and Noussan, 2021). Renaud-Blondeau *et al.* (2023) indicate that there is a relationship between perceived accessibility and the adoption of electric vehicles. In line with the Technology Acceptance Model, where PEOU influences PU (Davis, 1989) , this study adapts the relationship to the policy context. Specifically, when citizens perceive a policy as more accessible,

meaning that information is easy to obtain, procedures are transparent, and compliance is straightforward, they are more likely to regard the policy as effective in achieving its intended objectives.

H2a: Perceived policy accessibility positively influences public attitude towards EV-supporting policies

H2b: Perceived policy accessibility positively influences perceived policy effectiveness

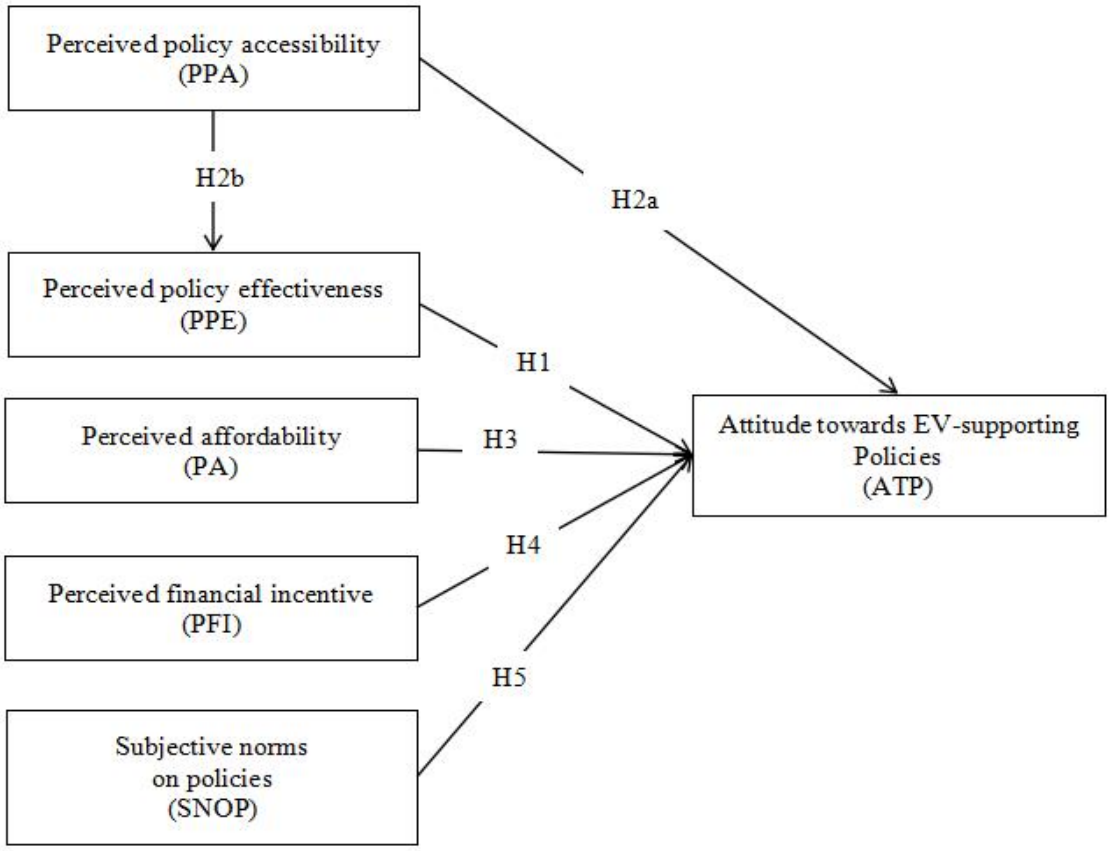
TAM, while designed as a technology-driven model, relies on basic constructs that fall short in addressing the wide range of user task environments. Consequently, it requires modification and extension to more effectively explain innovative technology adoption behavior (Chanda *et al.*, 2024). This research enhances the TAM by adding three constructs: perceived affordability; perceived financial incentives; subjective norms on policies (Figure 2).

3.2.3. Perceived affordability (PA)

EV affordability is primarily defined as a household's financial ability to purchase an electric vehicle (EV) while retaining sufficient resources to cover basic needs, determined by an affordability threshold (Stefaniec *et al.*, 2025). Therefore, perceived affordability would refer to a household's subjective belief or assessment of their financial capacity to purchase an EV and still adequately meet their basic needs, rather than a rigorous calculation against a defined threshold. The high investment cost and higher purchase price of EVs are primary reasons for low uptake and consumer unwillingness to purchase (Wang, Tang and Pan, 2018; Zaino *et al.*, 2024). Besides, consumers are very sensitive to price, with many unwilling to accept EVs that cost more than traditional vehicles (Wang, Tang and Pan, 2018). While initial costs are high, EVs generally offer lower running and maintenance costs compared to ICVEs over their lifetime (Tseng, Wu and Liu, 2013; Stefaniec *et al.*, 2025). They also offer substantial lower energy consumption costs due to the lower cost of electricity per unit and the higher efficiency of electric powertrains, especially in urban driving conditions (Tseng, Wu and Liu, 2013; Langbroek, Franklin and Susilo, 2016). A longer vehicle lifetime or higher mileage can lead to greater overall cost savings for EVs, making their Lifetime Total Cost of Ownership more competitive (Tseng, Wu and Liu, 2013). Building upon the prior discussion, this study proposes the following hypothesis:

H3: Higher perceived affordability of electric vehicles (EVs) will lead to a greater acceptance toward adopting Evs

Figure 2. The research model.



3.2.4. Perceived financial incentives (PFI)

Financial incentives, in the context of EV-supporting policy, can be defined as policy measures implemented by governments or manufacturers to encourage the purchase and use of electric vehicles by directly reducing their cost or the cost associated with their operation. Therefore, perceived financial incentives would refer to a consumer's subjective understanding, evaluation, and anticipated value of the financial incentives offered for EV adoption, which influences their purchasing power and motivation.

Financial incentives, particularly purchase-based ones (subsidies, tax rebates), directly alleviate this initial financial burden, making EVs more economically viable and increasing the "affordability" for consumers. According to Tseng, Wu and Liu (2013), without tax credits, the lifetime total cost for an EV was about 18–19% higher than a CV. However, with federal tax credits, the lifetime total cost for EVs became generally

affordable, being no more than 2% higher than a CV. Many other studies confirm that financial incentives positively influence consumers' intention to purchase EVs (Langbroek, Franklin and Susilo, 2016; Zaino *et al.*, 2024; Stefaniec *et al.*, 2025). Results of studies in France indicate that subsidies and registration tax exemptions are critical factors driving wide-spread BEV adoption (Haidar and Aguilar Rojas, 2022). Norway and Sweden have effectively closed the price gap between the two vehicle types and achieved the highest levels of EVs per capita (PBO, 2022) by applying penalising taxes on ICEVs to fund EV grants.

Regarding public attitudes, Hoppe, Patt and Tröndle (2023) stated that policies paired with supportive measures (EV subsidies, infrastructure investment) gain higher approval. Fairness framing also matters: exemptions for vulnerable groups (low-income households, rural drivers) increase public support. Stefaniec *et al.* (2025) suggested that there should be differentiated subsidies based on income and household size to increase EV adoption, address these equity concerns and improve public perception of fairness. For those reasons, the following hypothesis is formulated:

H4: Perceived financial incentives have a positive effect on public attitude towards EV-supporting policies

3.2.5. Subjective norms on policies (SNOP)

According to Madden, Ellen and Ajzen (1992), subjective norms reflect an individual's perception of whether important referent others believe one should perform the behavior. In the context of electric vehicles support, subjective norms refer to social pressure perceived from others that influences one's intention to adopt EVs within the Theory of Planned Behavior framework (Ji, Jiang and Zhu, 2024).

De Groot and Schuitema (2012) demonstrated that when participants were presented with strong normative information (indicating that the majority of people supported an environmental policy), the acceptability of the policy was significantly higher than when it was framed as supported by only a minority. Their results confirmed that perceived social norms are a crucial determinant of policy acceptability (Schade and Schlag, 2003), with acceptability itself representing an attitudinal evaluation of policy measures (Schuitema, Steg and Rothengatter, 2010). Based on the above, the following hypothesis is proposed:

H5: Stronger subjective norms (higher perceived social pressure related to EV-supportive behaviors) are positively associated with public support for electric vehicle support policies.

3.2.6. Attitude towards EV-supporting policies (ATP)

As the overall tested variable, ATP is the measurement of the general acceptance of the public of EV policies. Based on Hu *et al.* (2023), three survey items are constructed to measure ATP. No hypothesis is drawn, as ATP is the dependent variable.

4.Research Methodology

4.1.Overall Research Approach

This study employs a quantitative research approach because the aim is to test hypotheses and measure the strength of relationships between different factors and public attitudes toward electric vehicle (EVs) policies.

4.2.Research Method

The research method is based on a structured three-part self-administrated questionnaire.

- The first part provides a concise overview of the survey's objectives, purpose and scope.
- The second module serves as a screening section, collecting participant's demographic details and their consciousness of electric-vehicle supporting policies (e.g., age, education level, income, use of EVs)
- The last part encompassed 22 items to measure eight variables. For "Perceived affordability", 4 items were adopted based on the studies of Wang *et al.* (2018) and Chen, Selamat and Lee (2025), while "Perceived financial incentives" was assessed using 4 items adapted from Wang *et al.* (2018), Chen, Selamat and Lee (2025), Tseng, Wu and Liu (2013) and Lashari, Ko and Jang (2021). "Perceived policy effectiveness" was obtained through 3 items introduced by Chanda *et al.* (2024). As for "Perceived policy accessibility", 3 first items were utilized based on Morais (2023) and Falchetta and Noussan (2021); other last 2 items were based on the classic TAM model. "Subjective norms on policies" were measured using 3 items of Schuitema, Steg and Rothengatter (2010). "Attitude towards EV-

supporting policies" were based on Hu *et al.* (2023). All statements were rated on a five-point Likert scale ranging from 1 (= "strongly disagree") to 5 (= "strongly agree") (Table 1).

Initially, a paper-based questionnaire was drafted in English, subsequently translated into Vietnamese, ensuring precise adaptation to the local context. Next, the instrument was piloted on a sample of 20 respondents to uncover ambiguous words or procedural issues. Finally, the assessment tool was approved for use in the official survey.

Variable	Code	Content	Reference
None	**None**	How old are you? (15 to 18, 19 to 29, 30 to 49, 50 to 69, 70 or older)	Nordhoff and Hardman, 2025
	None	What is your highest education level? (High School Graduate, College or Associate's, Bachelor's, Master/Doctorate or Professional Degree)	Nordhoff and Hardman, 2025
	None	What is your income level per month? (Under 1 million, 1 - 5 millions, 5 - 18 millions, 18 - 32 millions, 32 millions - over)	Vietnamese Personal Income Tax Law
Subjective norms on policies (SNOP)	**SNOP1**	My family and close friends think banning fossil fuel vehicles is reasonable.	Schuitema, Steg and Rothengatter, 2010
	SNOP2	Buying and using EVs is common among my community (family, close friends, local neighborhood).	
	SNOP3	I think generally, the public is supportive of banning fossil fuel vehicles and mandating EVs.	

Perceived Policy Effectiveness (PPE)	**PPE1**	EV policy can improve my travel efficiency and improve my living quality.	Chanda *et al.*, 2024
	PPE2	EV policy will effectively reduce environmental pollution.	
	PPE3	I think generally, the public is supportive of banning fossil fuel vehicles and mandating EVs.	
Perceived Policy Accessibility (PPA)	**PPA1**	The EV support policies are easy to understand and transparent.	Morais, 2023 Falchetta and Noussan, 2021
	PPA2	I believe the policies are inclusive and fair to the majority of citizens.	
	PPA3	The charging infrastructure and related facilities (e.g., charging stations) is available and convenient.	
	PPA4	The accessibility of EV-supporting policies makes them more effective in increasing EV adoption.	Based on classic TAM (Davis, 1989)
	PPA5	The accessibility of EV-supporting policies makes them more successful in reducing pollution.	
Perceived affordability (PA)	**PA1**	Given my income and financial situation, I consider the current purchase price of an Electric Vehicle (EV) in Hanoi to be affordable for me now.	Wang *et al.*, 2018 Chen, Selamat and Lee, 2025
	PA2	I believe that if I started saving money now, in the near future (8-10 months), my savings will allow me to comfortably afford an EV.	

	PA3	I believe the attendant costs (e.g., electricity, maintenance, insurance) of an EV are lower than those of a comparable fossil-fuel vehicle in Hanoi.	
	PA4	Fluctuations in fossil fuel prices (e.g., gasoline) make the purchase of EV more financially advantageous to me.	
Perceived financial incentives (PFI)	**PFI1**	I am fully aware of government financial incentives towards EV adoption (subsidies, tax rebates, registration fee exemptions, energy price discounts at charging spots, etc.).	Wang *et al.*, 2018 Chen, Selamat and Lee, 2025 Tseng, Wu and Liu, 2013 Lashari, Ko and Jang, 2021
	PFI2	I believe that financial incentives (subsidies, tax rebates, registration fee exemptions, etc.) make EVs more accessible (e.g. financial incentives significantly reduce the cost of owning an EV).	
	PFI3	Electricity price incentives and charging discounts make EV usage more affordable compared to fossil-fuel vehicles.	
	PFI4	Without government financial incentives, I would be less willing to adopt an EV.	
Attitude towards EV-supporting policies (ATP)	**ATP1**	Generally, I support the implementation of EV-supporting policies.	Hu *et al.* (2023)
	ATP2	Generally, I support the implementation of fossil fuel vehicle bans.	
	ATP3	Generally, I believe the implementation	

		of EV-supporting and fossil fuel vehicle ban in 2026 is appropriate.	

Table 1. Survey items

4.3. Data collection

Primary data was collected through a questionnaire survey distributed both online and offline. For the online method, the questionnaire was designed using Google Forms and shared via social media platforms as well as relevant scientific research groups to reach a diverse pool of respondents. The targeted prospective respondents are members of online groups and forums primarily focused on EVs.

For the offline method, paper-based surveys were distributed in selected public areas in Ha Noi, particularly in locations that are strongly affected by the gasoline vehicle ban. Examples include Hoan Kiem Lake and the Old Quarter (where traffic restrictions are often implemented), Kim Ma and Giang Vo streets (major commuting routes with high vehicle density), and Cau Giay district (a central urban area with diverse demographics). This targeted selection ensures the responses capture the perceptions of individuals who are directly influenced by the policy.

4.4. Sampling Method and Sample Size

The study adopted a convenience sampling method to collect data from residents of Hanoi, primarily due to limitations in time, budget, and accessibility. Despite this non-probability approach, efforts were made to ensure that the sample reflects diverse demographic characteristics, including age, educational level, and income group, to enhance representativeness.

The expected sample size was determined based on the guideline suggested by Harris (1985, 2013) for multiple regression analysis, which recommends that the sample size (N) should satisfy the condition $N \geq 104 + m$, where m represents the number of independent variables. In this study, 5 independent variables are included. Therefore, the minimum sample size should be 110. To improve statistical reliability and allow for potential incomplete responses, the researcher plans to collect approximately 200-250 valid responses. This sample size is considered sufficient for exploratory and confirmatory

factor analyses, as it exceeds the minimum threshold recommended for studies using Likert-scale questionnaires.

4.5. Analytical method

Anderson and Gerbing (1988) advocated for separately assessing the measurement model (how observed variables relate to underlying constructs) before estimating the full structural model (how constructs causally relate to each other). So far, this two-step approach has been used in many researches (Higueras-Castillo *et al.*, 2019; Ru, Qin and Wang, 2019; Xu *et al.*, 2020; Ha *et al.*, 2023).

In this study, the partial least squares structural equation modeling method (PLS-SEM) was employed to evaluate both the measurement and structural models. This technique has been highly attractive to researchers, as it allows the estimation of complex models involving numerous constructs, indicators, and structural paths without requiring distributional assumptions of the data (Hair *et al.*, 2019). Therefore, PLS-SEM was chosen for this study. The analysis commenced with testing the reliability and validity of the measurement model, followed by an examination of the conceptual framework. The SEM analyses were conducted using SmartPLS 4. In addition, SPSS 26 was utilized to compute the descriptive statistics of the survey constructs.

5. Results

5.1.Sample descriptive statistics

5.1.1. Demographic information

Table 1. Demographics of the respondents (N=218)

Variable	Value	Frequency	Percentage (%)
Age	15-18	11	5
	19-29	52	23.9
	30-49	76	34.9
	50-69	58	26.6

	70 or older	21	9.6
Educational level	High school graduate	1	0.5
	College Associate	73	33.5
	Bachelor's	74	33.9
	Master-Doctorate	56	25.7
	Professional Degree	14	6.4
Income	<1 million VND	12	5.5
	1-5 million VND	47	21.6
	5-18 million VND	98	45
	18-32 million VND	49	22.5
	>32 million VND	12	5.5

The survey collected demographic data from 218 valid respondents as detailed in Table 1. The majority of respondents were 30 to 49 years old (34.9%), and 19-29 (23.9%), indicating a dominantly working age sample. College Associate (33.5%) and Bachelor's degree (33.9%) were the two major educational levels, and around one quarter (25.7%) attained a Master or Doctorate degree. Most respondents belonged in the 5-18 million VND income brackets (45%).

5.1.2. Descriptive statistics of scale variables

Table 2. Descriptive statistics of scale variables

	Minimum	Maximum	Mean	Std. Deviation
PA 1	1	5	3.02	1
PA 2	1	5	3.08	1.083
PA 3	1	5	3.07	1.009

PA 4	1	5	3.18	1.047
PFI 1	1	5	3.55	0.88
PFI 2	1	5	3.59	0.972
PFI 3	1	5	3.59	0.876
PFI 4	1	5	3.56	0.955
PPE 1	1	5	3.54	1.052
PPE 2	1	5	3.5	1.108
PPE 3	1	5	3.47	1.026
PPA 1	2	5	3.45	0.89
PPA 2	1	5	3.43	0.973
PPA 3	1	5	3.47	0.97
PPA 4	1	5	3.44	0.978
PPA 5	1	5	3.39	0.959
SNOP 1	1	5	3.5	0.907
SNOP 2	1	5	3.52	0.917
SNOP 3	1	5	3.45	0.926
ATP 1	1	5	3.63	1.057
ATP 2	1	5	3.66	1.058
ATP 3	1	5	3.65	1.098

Table 2 summarizes the mean and standard deviation of respondent answers on each survey item. All items observed a mean between 3.02 (PA 1) and 3.66 (ATP 2). This indicated that the vast majority of respondents chose “3 - Neutral” or “4 - Agree” for any

survey item. Standard deviations were fluctuating around 1, with the lowest 0.88 (PFI 1) and the highest 1.108 (PPE 2). This implied mild rates of variability in responses among the scales. All scales recorded the lowest value - 1 and the highest value - 5.

5.2. Measurement model evaluation

This study followed four steps below to assess the reflective measurement model, as suggested by (Hair *et al.*, 2019):

- Firstly, Table 3 shows that the outer loading values of each item met the suggested level 0.708, thus indicating reliability (Hair *et al.*, 2019).
- Secondly, indicating internal consistency reliability, Table 3 shows that the Cronchbach's Alpha and composite reliability values of constructs were higher than the recommended 0.70 (Hair *et al.*, 2019).
- Thirdly, indicating convergent validity, Table 3 reveals the average variance extracted exceeded the 0.50 threshold (Hair *et al.*, 2019).
- Finally, indicating discriminant validity, Table 4 and Table 5 present that the square root of each construct's AVE exceeds the correlation coefficient between that construct and others (Fornell and Larcker, 1981) and Heterotrait-Monotrait Ratio values remain below 0.85 (Henseler *et al.*, 2014).

Accordingly, the measurement model demonstrates adequate reliability and validity.

Table 3. Evaluation of measurement model

Latent constructs/items		**Outer loadings**	**CA**	**CR**	**AVE**
Subjective norms on policies (SNOP)			0.875	0.921	0.796
SNOP 1	My family and close friends think banning fossil fuel vehicles is reasonable.	0.883			
SNOP 2	Buying and using EVs is common among my community (family, close friends, local neighborhood).	0.973			
SNOP 3	I think generally, the public is supportive of banning fossil fuel vehicles and mandating	0.812			

	EVs.				
Perceived Policy Effectiveness (PPE)			0.857	0.913	0.778
PPE 1	EV policy can improve my travel efficiency and improve my living quality	0.889			
PPE 2	EV policy will effectively reduce environmental pollution	0.853			
PPE 3	EV support policies will contribute to Hanoi's sustainable development goals."	0.903			
Perceived Policy Accessibility (PPA)			0.911	0.934	0.739
PPA 1	The EV support policies are easy to understand and transparent.	0.818			
PPA 2	I believe the policies are inclusive and fair to the majority of citizens.	0.856			
PPA 3	The charging infrastructure and related facilities (e.g., charging stations) is available and convenient.	0.879			
PPA 4	The accessibility of EV-supporting policies makes them more effective in increasing EV adoption	0.908			
PPA 5	The accessibility of EV-supporting policies makes them more successful in reducing pollution.	0.833			
Perceived affordability (PA)			0.903	0.933	0.776
PA 1	Given my income and financial situation, I consider the current purchase price of an Electric Vehicle (EV) in Hanoi to be	0.890			

	affordable for me now.				
PA 2	I believe that if I started saving money now, in the near future (8-10 months), my savings will allow me to comfortably afford an EV.	0.919			
PA 3	I believe the attendant costs (e.g., electricity, maintenance, insurance) of an EV are lower than those of a comparable fossil-fuel vehicle in Hanoi.	0.878			
PA 4	Fluctuations in fossil fuel prices (e.g., gasoline) make the purchase of EV more financially advantageous to me.	0.835			
Perceived financial incentives (PFI)			0.890	0.924	0.753
PFI 1	I am fully aware of government financial incentives towards EV adoption (subsidies, tax rebates, registration fee exemptions, energy price discounts at charging spots, etc.).	0.830			
PFI 2	I believe that financial incentives (subsidies, tax rebates, registration fee exemptions, etc.) make EVs more accessible (e.g. financial incentives significantly reduce the cost of owning an EV).	0.877			
PFI 3	Electricity price incentives and charging discounts make EV usage more affordable compared to fossil-fuel vehicles.	0.872			
PFI 4	Without government financial incentives, I would be less willing to adopt an EV	0.889			
Attitude towards EV-supporting policies (ATP)			0.890	0.932	0.820

ATP 1	Generally, I support the implementation of EV-supporting policies.	0.883			
ATP 2	Generally, I support the implementation of fossil fuel vehicle bans.	0.928			
ATP 3	Generally, I believe the implementation of EV-supporting and fossil fuel vehicle ban in 2026 is appropriate.	0.905			

Table 4. Results of Heterotrait-monotrait ratio (HTMT)

	ATP	PA	PFI	PPA	PPE	SNOP
ATP						
PA	0.379					
PFI	0.384	0.045				
PPA	0.655	0.29	0.132			
PPE	0.758	0.216	0.127	0.313		
SNOP	0.054	0.069	0.065	0.128	0.062	

Table 5. Fornell-Larcker criterion for discriminant validity

	ATP	PA	PFI	PPA	PPE	SNOP
ATP	0.905					
PA	0.342	0.881				
PFI	0.343	-0.035	0.868			
PPA	0.593	0.269	0.124	0.859		

PPE	0.661	0.191	0.113	0.283	0.882	
SNOP	-0.054	0.065	-0.022	0.11	-0.051	0.892

5.3. Structural model evaluation

5.3.1. Multicollinearity test

Preferably, the VIF values ought to be around 3 or lower to ensure that it does not bias the regression results (Hair *et al.*, 2019). As shown in Table 6, the risk of collinearity was insignificant.

Table 6. Collinearity test

	VIF
PA -> ATP	1.105
PFI -> ATP	1.030
PPA -> ATP	1.178
PPA-> PPE	1.000
PPE -> ATP	1.122
SNOP -> ATP	1.023

5.3.2. Explanatory power of the model

This study used R^2 adjusted, which has the same meaning as R^2, to evaluate the explanatory power of the model. Table 7 reveals that independent variables explained 69% of the variation in attitudes towards EV-supporting policy, indicating substantial explanatory power (Hair *et al.*, 2011; Henseler *et al.*, 2009). Meanwhile, the explanatory power of the model for perceived policy effectiveness is negligible, as the adjusted R^2 value is below 0.1 (Hair *et al.*, 2011; Henseler *et al.*, 2009).

Table 7. Explanatory power of the model			
Constructs	**R^2**	**R^2 adjusted**	**Explanatory power level**
ATP	0.697	0.69	Substantial
PPE	0.08	0.076	Negligible

5.3.3. Evaluation of effect size

Table 8 indicated that PPA and PPE had the strongest impacts on attitude towards EV-supporting policies, with $f^2 = 0.428$ and $f^2 = 0.704$ respectively (Cohen, 2013).

Table 8. Evaluation of importance of independent variables		
	f-square	**Level of impact**
PA -> ATP	0.073	Weak
PFI -> ATP	0.189	Medium
PPA -> ATP	0.428	Substantial
PPA -> PPE	0.087	Weak
PPE -> ATP	0.704	Substantial
SNOP -> ATP	0.019	Weak

5.3.4. Path evaluation

A bootstrapping technique involving 5,000 resamples was employed to evaluate the direct, indirect, and total relationships among the proposed constructs.

5.3.4.1. Direct effect

Both perceived policy effectiveness and accessibility had significant positive impacts on attitude towards EV-supporting policies ($\beta = 0.490$, $p=0.000$; $\beta = 0.391$, $p=0.000$), supporting H1 and H2a. Perceived policy accessibility also significantly and positively influenced perceived policy effectiveness ($\beta = 0.283$, $p=0.000$), confirming H2b.

Similarly, perceived affordability and financial incentives had significant positive relationships with attitudes towards EV-supporting policies (β = 0.157, p = 0.000; β = 0.243, p = 0.000), thereby supporting H3 and H4. However, attitudes towards EV-supporting policies appeared to be unaffected by subjective norms on policies (β = -0.077, p = 0.093), leading to the rejection of H5. To sum up, five out of six hypotheses were statistically supported at the significance level of 5%.

Table 9. Direct, indirect, and total effects

Path	Direct effects					Total indirect effects			Total effects		
	β	**Std.**	**p**	**H**	**Results**	**β**	**Std.**	**p**	**β**	**Std.**	**p**
PPE -> ATP	0.490***	0.049	0.000	H1	Support				0.490***	0.049	0.000
PPA -> ATP	0.391***	0.054	0.000	H2a	Support	0.138***	0.037	0.000	0.529***	0.052	0.000
PPA -> PPE	0.283***	0.064	0.000	H2b	Support				0.283***	0.064	0.000
PA -> ATP	0.157***	0.037	0.000	H3	Support				0.157***	0.037	0.000
PFI -> ATP	0.243***	0.040	0.000	H4	Support				0.243***	0.040	0.000
SNOP -> ATP	-0.077ns	0.046	0.093	H5	Reject				-0.077ns	0.046	0.093

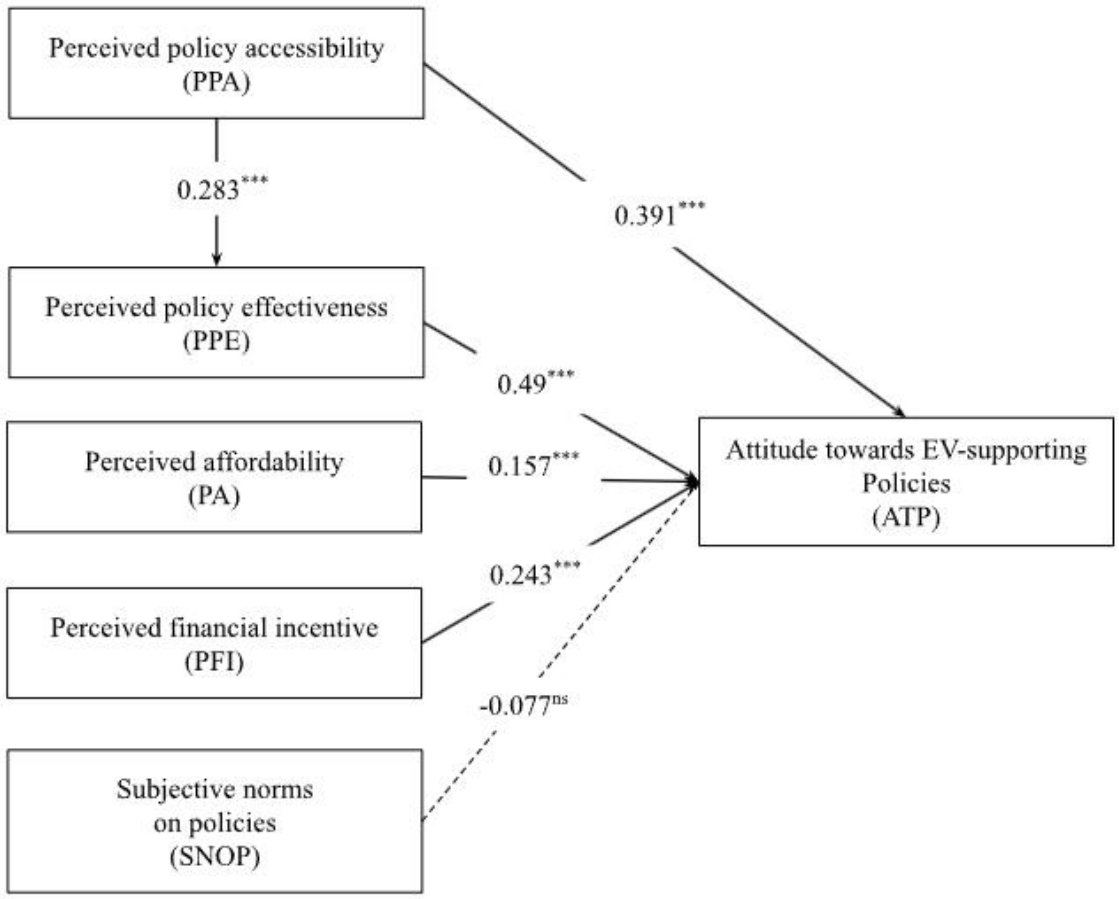
Note: ***p <0.001; ***p <0.01; *p <0.05; ns: non-significant

5.3.4.2. Indirect effect

From Table 10, it is noticeable that the relationship between perceived policy accessibility and attitude towards EV - supporting policies was partially mediated by perceived policy effectiveness (β = 0.138, p = 0.000).

Table 10. Specific indirect effect			
	β	**Std.**	**p**
PPA -> PPE -> ATP	0.138	0.037	0.000

Figure 3. The path analysis results.



Note: ***p < 0.001; **p < 0.01; *p < 0.05; ns: non-significant; dotted line represents insignificant path.

4.3.4.3. Total effect

In general, there are 5 significant relationships among factors. Table 9 shows that the influences of perceived policy accessibility and perceived policy effectiveness on attitude towards EV - supporting policies ranked the first and second position, with β = 0.529 and β = 0.490 respectively. In addition, perceived affordability had the lowest positive impact

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on attitude towards EV - supporting policies (β = 0.157). Meanwhile, the negative effect of subjective norms was insignificant.

6. Discussion

6.1. Theoretical implications

The findings of the research corroborate that when public assume the EV-supporting policies to be effective with their lives, they tend to have more positive attitude toward these policies, sharing the same view with Broadbent *et al.*, 2021, Wang *et al.*, 2018 that supportive and clear government policies can significantly sway people to be more positive toward EV policies. Beside that, the perceived policy effectiveness plays a more decisive role than other factors in affecting the attitude of citizens toward those policies, indicating that effective policymaking is a crucial element of public trust. The study extends the previous theories of Drews and Van Den Bergh, 2016 by investigating the attitude toward specific climate policies, which are EV - supporting policies. The findings also confirm that the case study in Ha Noi is similar to Thailand (Chonsalasin *et al.*, 2024) in that people had a tendency to follow and welcome new policies that they viewed as effective and timely beneficial.

In addition, the study of Hu *et al.*, 2023 confirms that convenient EV policies are positively associated with the attitude towards EVs, however the attitude toward EV policies have not been investigated yet. Therefore, the results of this research have broadened the findings from previous studies. However, the study contradicts with the findings of (Wang *et al.*, 2021) which demonstrate the heterogeneity of the influence of citizens' perceptions of financial incentive policies and perceptions of convenience policies on EV attitudes. In contrast, this study confirms that perceived policy accessibility has a more noticeable effect on attitude toward EV policies than other factors.

Statistics helped conclude that perceived affordability did have a positive relation with attitude toward adopting EVs; yet this relation was the weakest. This finding is in accordance with the works of Anser, Yousaf and Zaman (2020); Zeng *et al.* (2022) that green technology is generally more accepted if companied with first-purchase subsidies. Furthermore, this study may conclude that first-time financial incentives such as low-interest loans may encourage more people to make the switch, with support from the study of Rasoulinezhad and Taghizadeh-Hesary (2022). This study also provides support for the claim that the more accessible policies are designed, the more effective they are to

the public. This is the extension of previous works of Burden *et al.* (2012); Bang, Shu and Weber, (2020); Wang *et al.* (2021) that accessibility was a major driver of perceived policy benefits to the public, and administrative burden only worsened the perception of the public. Thus, accessibility planning models such as ones proposed by Ferreira and Batey (2007) may be applicable to the task of building EV-supporting policies.

This study also affirms the positive correlational relation between perceived financial incentives and public attitude towards EV-supporting policies as stated by Hu *et al.* (2023); Xue *et al.* (2023); Ansab and Kumar, (2024). Moreover, this study for the first time establishes the impact of financial subsidies on attitude towards EV-supporting policies in the context of a ban on fossil fuel vehicles in Vietnam, indicating that Hanoi citizens have similar reactions compared to Chinese public in the post-incentive context as studied by Liao (2022) in which financial incentives of the Chinese government did in fact encourage more buyers of EVs and in the real case of Vietnam, previously introduced financial relief packages for new buyers of EVs did show noticeable results.

Surprisingly, the hypothesis of subjective norms on policies was rejected by the collected data in this study, despite support from the previous literature including Rahman and Thill (2024), Alshurideh *et al.* (2025), De Groot and Schuitema (2012). It may be explained that moral norms rather than subjective norms actually impact attitudes to EV-supporting policies as evidenced from Liu, Liu and Mo (2020). The work of Niemiec *et al.* (2020) also concluded that it was not subjective norms but descriptive and personal norms that played the crucial role in shaping one's attitude towards green policies. Therefore, the non-effect of subjective norms may be because they were overpowered by moral, descriptive and personal norms that were not addressed by this study. In reality, it is noticeable that reactions from the public indeed consist of multifaceted cross-effective norms rather than solely subjective norms.

6.2. Managerial implications

The findings provide essential implications for policymakers in Hanoi as both EV-supporting policies and the fossil-fuel vehicle ban coexist. The perceived policy effectiveness and perceived policy accessibility have most significant impacts on public attitudes toward EV-supporting policies, requiring policymakers to focus on policy design with clarity, fairness and comprehensiveness. Specifically, it is crucial to provide financial incentives such as subsidies, tax reductions for EV buyers, as well as non-

financial incentives such as dedicated parking spaces or priority lanes. Addressing infrastructural concerns relating to expanding the charging network and ensuring affordable maintenance services can enhance public willingness to shift away from fossil-fuel vehicles.

Moreover, collaboration with private sector stakeholders such as automotive manufacturers, and technology companies should be promoted to strengthen the ecosystem supporting EV adoption. Notably, collaboration with Vietnam's leading EV manufacturers including Vinfast presents a strategic pathway to both promote adoption among local consumers and to strengthen the domestic EV industry.

Finally, authorities should establish effective feedback channels to continuously monitor citizens' responses toward policy implementation. Providing avenues for public participation not only improves trust in government decisions but also allows timely adjustments to reduce unintended negative consequences.

7. Conclusion

This study has enhanced the understanding of factors affecting public attitudes toward EV policies in Hanoi under the forthcoming fossil-fuel vehicle ban. The findings reveal that perceived policy effectiveness, perceived policy accessibility, perceived affordability and perceived financial incentives all have effects on public attitudes, with perceived policy effectiveness and perceived policy accessibility affecting public acceptance most remarkably. By contrast, subjective norms showed no influence in public attitudes. This confirms the applicability of the TAM-based framework and helps provide practical advice for policymakers.

This study offers significant theoretical and practical contributions. First, it presents novel insights into factors influencing public attitudes toward electric vehicle-supporting policies in Hanoi in the light of the upcoming fossil-fuel vehicle ban. Second, the research indicates that perceived policy effectiveness and perceived policy accessibility have most positively substantial impacts on the acceptance of citizens towards EV-supporting policies. The third contribution is actionable recommendations for policymakers to publish transparent policy design and timelines, accelerate navigable charging facilities and introduce targeted financial incentives to raise public acceptance of EV-supporting policy.

The research team acknowledges that the study may be limited in certain aspects. Firstly, the expected database may be unintentionally biased due to the use of the cross-sectional convenience sampling method. The authors aim to reduce data bias by carefully selecting suitable online and offline respondent groups. The survey also includes two screening questions to eliminate any potentially invalid responses. Secondly, the choice of quantitative methodology means that certain important factors may not be considered. The research team poses this as potential research opportunities - future studies can focus more intensively on factors including but not limited to psychological factors, cultural perceptions, moral norms, descriptive norms or brand awareness.

References

Ale, D. (2024) "Electric Vehicle in Kathmandu Valley: Understanding Public Perception and Adoption," *The Lumbini Journal of Business and Economics*, 12(1), pp. 41–49. Available at: https://doi.org/10.3126/ljbe.v12i1.70320.

Alshurideh, M.T. *et al.* (2025) "Consumer and Economic Influences on Electric Vehicle Adoption: The Mediating Role of Attitudes and the Moderating Effect of Demographics," International Journal of Energy Economics and Policy, 15(3), pp. 214–229. Available at: https://doi.org/10.32479/ijeep.19313.

Anderson, J.C. and Gerbing, D.W. (1988) "Structural equation modeling in practice: A review and recommended two-step approach.," *Psychological Bulletin*, 103(3), pp. 411–423. Available at: https://doi.org/10.1037/0033-2909.103.3.411.

Ansab, K.V. and Kumar, S.P. (2024) "Influence of government financial incentives on electric car adoption: empirical evidence from India," South Asian Journal of Business Studies, 13(2), pp. 226–243. Available at: https://doi.org/10.1108/SAJBS-03-2021-0088.

Anser, M.K., Yousaf, Z. and Zaman, K. (2020) "Green Technology Acceptance Model and Green Logistics Operations: 'To See Which Way the Wind Is Blowing,'" Frontiers in Sustainability, 1, p. 3. Available at: https://doi.org/10.3389/frsus.2020.00003.

Bang, H.M., Shu, S.B. and Weber, E.U. (2020) "The role of perceived effectiveness on the acceptability of choice architecture," Behavioural Public Policy, 4(1), pp. 50–70. Available at: https://doi.org/10.1017/bpp.2018.1.

Brand, C and Anable, J orcid.org/0000-0002-4259-1641 (2019) 'Disruption' and 'continuity' in transport energy systems: the case of the ban on new conventional fossil fuel vehicles. In: European Council for an Energy Efficient Economy (ECEEE) Summer Study 2019 Proceedings. ECEEE 2019 Summer Study, 03-07 Jun 2019, Hyères France. , pp. 1117-1127.

Broadbent, G.H., Wiedmann, T.O. and Metternicht, G.I. (2021) "Electric Vehicle Uptake: Understanding the Print Media's Role in Changing Attitudes and Perceptions," World Electric Vehicle Journal, 12(4), p. 174. Available at: https://doi.org/10.3390/wevj12040174.

Burch, I. & Gilchrist, J. (2020) Survey of global activity to phase out internal combustion engine vehicles: March 2020 revision. Edited by A. Hancock & G. Waaland. Available at: https://theclimatecenter.org/wp-content/uploads/2020/03/Survey-on-Global-Activities-to-Phase-Out-ICE-Vehicles-update-3.18.20-1.pdf

Burden, B.C. et al. (2012) "The Effect of Administrative Burden on Bureaucratic Perception of Policies: Evidence from Election Administration," Public Administration Review, 72(5), pp. 741–751. Available at: https://doi.org/10.1111/j.1540-6210.2012.02600.x.

Chanda, R.C. *et al.* (2024) "Achieving a sustainable future by analyzing electric vehicle adoption in developing nations through an extended technology acceptance model," *Sustainable Futures*, 8, p. 100386. Available at: https://doi.org/10.1016/j.sftr.2024.100386.

Chau, P.Y.K. (1996) "An Empirical Assessment of a Modified Technology Acceptance Model," *Journal of Management Information Systems*, 13(2), pp. 185–204. Available at: https://doi.org/10.1080/07421222.1996.11518128.

Chen, P., Selamat, M.H. and Lee, S.-N. (2025) "The Impact of Policy Incentives on the Purchase of Electric Vehicles by Consumers in China's First-Tier Cities: Moderate-Mediate Analysis," *Sustainability*, 17(12), p. 5319. Available at: https://doi.org/10.3390/su17125319.

Chonsalasin, D. *et al.* (2024) "Exploring the Influence of Thai Government Policy Perceptions on Electric Vehicle Adoption: A Measurement Model and Empirical

Analysis," Smart Cities, 7(4), pp. 2258–2282. Available at: https://doi.org/10.3390/smartcities7040089.

Cohen, J. (2013) *Statistical Power Analysis for the Behavioral Sciences*. 0 ed. Routledge. Available at: https://doi.org/10.4324/9780203771587.

Davis, F.D. (1989) "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, 13(3), p. 319. Available at: https://doi.org/10.2307/249008.

De Groot, J.I.M. and Schuitema, G. (2012) "How to make the unpopular popular? Policy characteristics, social norms and the acceptability of environmental policies," *Environmental Science & Policy*, 19–20, pp. 100–107. Available at: https://doi.org/10.1016/j.envsci.2012.03.004.

Dinçer, İ. and Zamfirescu, C. (2011) "Fossil Fuels and Alternative Fuels," in Dinçer, İ. and Zamfirescu, C., *Sustainable Energy Systems and Applications*. Boston, MA: Springer US, pp. 169–201. Available at: https://doi.org/10.1007/978-0-387-95861-3_6.

Dong, F. *et al.* (2022) "Factors influencing public support for banning gasoline vehicles in newly industrialized countries for the sake of environmental improvement: a case study of China," *Environmental Science and Pollution Research*, 29(29), pp. 43942–43954. Available at: https://doi.org/10.1007/s11356-022-18884-x.

Drews, S. and Van Den Bergh, J.C.J.M. (2016) "What explains public support for climate policies? A review of empirical and experimental studies," *Climate Policy*, 16(7), pp. 855–876. Available at: https://doi.org/10.1080/14693062.2015.1058240.

Ehsan, F. *et al.* (2024) "Assessing policy influence on electric vehicle adoption in China: An in-depth study," *Energy Strategy Reviews*, 54, p. 101471. Available at: https://doi.org/10.1016/j.esr.2024.101471.

Eisenmann, C., Görges, D. and Franke, T. (2021) "Electric Vehicles," in *International Encyclopedia of Transportation*. Elsevier, pp. 147–154. Available at: https://doi.org/10.1016/B978-0-08-102671-7.10419-1.

Falchetta, G. and Noussan, M. (2021) "Electric vehicle charging network in Europe: An accessibility and deployment trends analysis," *Transportation Research Part D: Transport and Environment*, 94, p. 102813. Available at: https://doi.org/10.1016/j.trd.2021.102813.

Ferreira, A. and Batey, P. (2007) “Re-thinking accessibility planning: A multi-layer conceptual framework and its policy implications,” Town Planning Review, 78(4), pp. 429–458. Available at: https://doi.org/10.3828/tpr.78.4.3.

Ha Phuong (2025) “Thị trường ô tô Việt Nam: Ngày càng khốc liệt, xe điện lên ngôi”, Tạp chí Kinh tế - Tài chính, 18/07/2025. Available at: https://tapchikinhtetaichinh.vn/thi-truong-o-to-viet-nam-ngay-cang-khoc-liet-xe-dien-len-ngoi.html

Ha, T.T. *et al.* (2023) “Investigation of Influential Factors of Intention to Adopt Electric Vehicles for Motorcyclists in Vietnam,” *Sustainability*, 15(11), p. 8765. Available at: https://doi.org/10.3390/su15118765.

Haidar, B. and Aguilar Rojas, M.T. (2022) “The relationship between public charging infrastructure deployment and other socio-economic factors and electric vehicle adoption in France,” *Research in Transportation Economics*, 95, p. 101208. Available at: https://doi.org/10.1016/j.retrec.2022.101208.

Hair, J.F. *et al.* (2019) “When to use and how to report the results of PLS-SEM,” European Business Review, 31(1), pp. 2–24. Available at: https://doi.org/10.1108/EBR-11-2018-0203.

Hair, J.F., Ringle, C.M. and Sarstedt, M. (2011) “PLS-SEM: Indeed a Silver Bullet,” Journal of Marketing Theory and Practice, 19(2), pp. 139–152. Available at: https://doi.org/10.2753/MTP1069-6679190202.

Harris, R.J. (1985) *A primer of multivariate statistics*. 2nd ed. Orlando: Academic Press.

Harris, R.J. (2013) *A primer of multivariate statistics*. Third edition. New York, New York ; Hove, England: Psychology Press.

Henseler, J. *et al.* (2014) “Common Beliefs and Reality About PLS: Comments on Rönkkö and Evermann (2013),” *Organizational Research Methods*, 17(2), pp. 182–209. Available at: https://doi.org/10.1177/1094428114526928.

Henseler, J., Ringle, C.M. and Sinkovics, R.R. (2009) “The use of partial least squares path modeling in international marketing,” in R.R. Sinkovics and P.N. Ghauri (eds.) Advances in International Marketing. Emerald Group Publishing Limited, pp. 277–319. Available at: https://doi.org/10.1108/S1474-7979(2009)0000020014.

Hidayat, R. and Cowie, J. (2023) “A framework to explore policy to support the adoption of electric vehicles in developing nations: A case study of Indonesia,” *Transportation Research Procedia*, 70, pp. 364–371. Available at: https://doi.org/10.1016/j.trpro.2023.11.041.

Hien, P.D. *et al.* (2020) “Impact of urban expansion on the air pollution landscape: A case study of Hanoi, Vietnam,” *Science of The Total Environment*, 702, p. 134635. Available at: https://doi.org/10.1016/j.scitotenv.2019.134635.

Higueras-Castillo, E. *et al.* (2019) “Perceived Value and Customer Adoption of Electric and Hybrid Vehicles,” *Sustainability*, 11(18), p. 4956. Available at: https://doi.org/10.3390/su11184956.

Hoppe, J., Patt, A. and Tröndle, T. (2023) “Public support for phasing out carbon-intensive technologies: the end of the road for conventional cars in Germany?,” *Climate Policy*, 23(7), pp. 813–828. Available at: https://doi.org/10.1080/14693062.2023.2211042.

Houses of the Oireachtas (2022) "An Overview of Ireland’s Electric Vehicle Incentives and a Comparison With International Peers". Available at: https://data.oireachtas.ie/ie/oireachtas/parliamentaryBudgetOffice/2022/2022-06-02_an-overview-of-ireland-s-electric-vehicle-incentives-and-a-comparison-with-international-peers_en.pdf

Hu, X. *et al.* (2023) “Policy driven or consumer trait driven? Unpacking the EVs purchase intention of consumers from the policy and consumer trait perspective,” *Energy Policy*, 177, p. 113559. Available at: https://doi.org/10.1016/j.enpol.2023.113559.

Hubert, M. *et al.* (2017) “Acceptance of Smartphone-Based Mobile Shopping: Mobile Benefits, Customer Characteristics, Perceived Risks, and the Impact of Application Context,” *Psychology & Marketing*, 34(2), pp. 175–194. Available at: https://doi.org/10.1002/mar.20982.

Ji, Z., Jiang, H. and Zhu, J. (2024) “Factors Impacting Consumers’ Purchase Intention of Electric Vehicles in China: Based on the Integration of Theory of Planned Behaviour and Norm Activation Model,” *Sustainability*, 16(20), p. 9092. Available at: https://doi.org/10.3390/su16209092.

Kieu, M. *et al.* (2023) “Factors affecting perceptions in transport – A deep dive into the motorbike ban in Hanoi, Vietnam,” *Case Studies on Transport Policy*, 11, p. 100958. Available at: https://doi.org/10.1016/j.cstp.2023.100958.

Kieu, M. *et al.* (2024) “Evaluating public sentiment towards transport policies: A causal analysis of the motorbike ban in Hanoi,” *Case Studies on Transport Policy*, 16, p. 101203. Available at: https://doi.org/10.1016/j.cstp.2024.101203.

Kukreja, M. (2025) “Consumer Attitudes and Perceptions Towards Electric Vehicles,” *INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH IN ENGINEERING AND MANAGEMENT*, 09(04), pp. 1–9. Available at: https://doi.org/10.55041/IJSREM45171.

Langbroek, J.H.M., Franklin, J.P. and Susilo, Y.O. (2016) “The effect of policy incentives on electric vehicle adoption,” *Energy Policy*, 94, pp. 94–103. Available at: https://doi.org/10.1016/j.enpol.2016.03.050.

Lashari, Z.A., Ko, J. and Jang, J. (2021) “Consumers’ Intention to Purchase Electric Vehicles: Influences of User Attitude and Perception,” *Sustainability*, 13(12), p. 6778. Available at: https://doi.org/10.3390/su13126778.

Liao, Y. (2022) “Intention of consumers to adopt electric vehicle in the post-subsidy era: evidence from China,” International Journal of Sustainable Transportation, 16(7), pp. 647–659. Available at: https://doi.org/10.1080/15568318.2021.1918297.

LIU, H., SATO, H. and MORIKAWA, T. (2015) “Influences of Environmental Consciousness and Attitudes to Transportation on Electric Vehicle Purchase Intentions.” Eastern Asia Society for Transportation Studies. Available at: https://doi.org/10.11175/eastsats.3.430.

Liu, M.T., Liu, Y. and Mo, Z. (2020) “Moral norm is the key: An extension of the theory of planned behaviour (TPB) on Chinese consumers’ green purchase intention,” Asia Pacific Journal of Marketing and Logistics, 32(8), pp. 1823–1841. Available at: https://doi.org/10.1108/APJML-05-2019-0285.

Madden, T.J., Ellen, P.S. and Ajzen, I. (1992) “A Comparison of the Theory of Planned Behavior and the Theory of Reasoned Action,” *Personality and Social Psychology Bulletin*, 18(1), pp. 3–9. Available at: https://doi.org/10.1177/0146167292181001.

Miniard, P.W. and Cohen, J.B. (1981) “An examination of the Fishbein-Ajzen behavioral-intentions model’s concepts and measures,” Journal of Experimental Social Psychology, 17(3), pp. 309–339. Available at: https://doi.org/10.1016/0022-1031(81)90031-7.

Morais, H. (2023) “New approach for electric vehicles charging management in parking lots considering fairness rules,” *Electric Power Systems Research*, 217, p. 109107. Available at: https://doi.org/10.1016/j.epsr.2022.109107.

National Academy of Public Administration, Vietnam and Thanh, L.T. (2023) “Factors Affecting Attitude for Green Transformation Policy in Vietnam,” *International Journal of Multidisciplinary Research and Analysis*, 06(01). Available at: https://doi.org/10.47191/ijmra/v6-i1-20.

Nguyen, X.T. & Nguyen, Q.H. (2015) Service issues: Overview of electric vehicles use in Vietnam. Presented at the Armand Peugeot Chair International Conference: 3rd Electromobility Challenging Issues, Singapore, December 1–4, 2015. Clean Energy and Sustainable Development Laboratory, University of Science and Technology of Hanoi. Available at: https://hal.science/hal-01239618v1/document

Niemiec, R.M. *et al.* (2020) “Does the Impact of Norms Vary by Type of Norm and Type of Conservation Behavior? A Meta-Analysis,” Society & Natural Resources, 33(8), pp. 1024–1040. Available at: https://doi.org/10.1080/08941920.2020.1729912.

Nordhoff, S. and Hardman, S. (2025) “Exploring public support and opposition to 100% zero emission vehicle policy,” *Transportation Research Part F: Traffic Psychology and Behaviour*, 114, pp. 1294–1323. Available at: https://doi.org/10.1016/j.trf.2025.06.018.

Pamidimukkala, A. *et al.* (2023) “Evaluation of barriers to electric vehicle adoption: A study of technological, environmental, financial, and infrastructure factors,” *Transportation Research Interdisciplinary Perspectives*, 22, p. 100962. Available at: https://doi.org/10.1016/j.trip.2023.100962.

Park, E., Lim, J. and Cho, Y. (2018) “Understanding the Emergence and Social Acceptance of Electric Vehicles as Next-Generation Models for the Automobile Industry,” *Sustainability*, 10(3), p. 662. Available at: https://doi.org/10.3390/su10030662.

Rahman, Md.M. and Thill, J.-C. (2024) “A Comprehensive Survey of the Key Determinants of Electric Vehicle Adoption: Challenges and Opportunities in the Smart City Context,” World Electric Vehicle Journal, 15(12), p. 588. Available at: https://doi.org/10.3390/wevj15120588.

Rasoulinezhad, E. and Taghizadeh-Hesary, F. (2022) “Role of green finance in improving energy efficiency and renewable energy development,” Energy Efficiency, 15(2), p. 14. Available at: https://doi.org/10.1007/s12053-022-10021-4.

Renaud-Blondeau, P. *et al.* (2023) “Powering the transition: Public charging stations and electric vehicle adoption in Montreal, Canada,” *International Journal of Sustainable Transportation*, 17(10), pp. 1097–1112. Available at: https://doi.org/10.1080/15568318.2022.2152403.

Ru, X., Qin, H. and Wang, S. (2019) “Young people’s behaviour intentions towards reducing PM2.5 in China: Extending the theory of planned behaviour,” *Resources, Conservation and Recycling*, 141, pp. 99–108. Available at: https://doi.org/10.1016/j.resconrec.2018.10.019.

Schade, J. and Schlag, B. (2003) “Acceptability of urban transport pricing strategies,” *Transportation Research Part F: Traffic Psychology and Behaviour*, 6(1), pp. 45–61. Available at: https://doi.org/10.1016/S1369-8478(02)00046-3.

Schuitema, G., Steg, L. and Rothengatter, J.A. (2010) “The acceptability, personal outcome expectations, and expected effects of transport pricing policies,” *Journal of Environmental Psychology*, 30(4), pp. 587–593. Available at: https://doi.org/10.1016/j.jenvp.2010.05.002.

Shmueli, G. and Koppius, O. (2010) “Predictive Analytics in Information Systems Research,” *SSRN Electronic Journal* [Preprint]. Available at: https://doi.org/10.2139/ssrn.1606674.

Stefaniec, A. *et al.* (2025) “The challenge of making EVs just affordable enough: Assessing the impact of subsidies on equity and emission reduction in Ireland,” *Research in Transportation Economics*, 109, p. 101495. Available at: https://doi.org/10.1016/j.retrec.2024.101495.

Teo, T. (2009) “Is there an attitude problem? Reconsidering the role of attitude in the TAM,” *British Journal of Educational Technology*, 40(6), pp. 1139–1141. Available at: https://doi.org/10.1111/j.1467-8535.2008.00913.x.

Torné, A. and Trutnevyte, E. (2024) “Banning fossil fuel cars and boilers in Switzerland: Mitigation potential, justice, and the social structure of the vulnerable,” *Energy Research & Social Science*, 108, p. 103377. Available at: https://doi.org/10.1016/j.erss.2023.103377.

Trung Phuong, N. *et al.* (2024) “How will banning motorcycles affect the preferred mode choice of motorcyclists in Hanoi, Vietnam?,” *Asian Transport Studies*, 10, p. 100150. Available at: https://doi.org/10.1016/j.eastsj.2024.100150.

Truong, T.T.M. (2023) “Effectiveness of policy incentives on electric motorcycles acceptance in Hanoi, Vietnam,” *Case Studies on Transport Policy*, 13, p. 101020. Available at: https://doi.org/10.1016/j.cstp.2023.101020.

Tseng, H.-K., Wu, J.S. and Liu, X. (2013) “Affordability of electric vehicles for a sustainable transport system: An economic and environmental analysis,” *Energy Policy*, 61, pp. 441–447. Available at: https://doi.org/10.1016/j.enpol.2013.06.026.

Tuan, P.V. *et al.* (2022) “Factors Influencing Purchasing Intention Toward Electric Vehicle in Vietnam,” *Journal of Social Commerce*, 2(2), pp. 82–99. Available at: https://doi.org/10.56209/jommerce.v2i2.30.

Venkatesh, V. and Davis, F.D. (2000) “A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies,” *Management Science*, 46(2), pp. 186–204. Available at: https://doi.org/10.1287/mnsc.46.2.186.11926.

Vu Thi, H., Nguyen Thanh, C. and Vu Trong, T. (2024) “Analysis of factors affecting vehicle choice behavior in Hanoi city,” *Transport and Communications Science Journal*, 75(1), pp. 1125–1139. Available at: https://doi.org/10.47869/tcsj.75.1.2.

Wan, C., Shen, G.Q. and Yu, A. (2014) “The role of perceived effectiveness of policy measures in predicting recycling behaviour in Hong Kong,” *Resources, Conservation and Recycling*, 83, pp. 141–151. Available at: https://doi.org/10.1016/j.resconrec.2013.12.009.

Wang, H. *et al.* (2021) “Linking Perceived Policy Effectiveness and Proenvironmental Behavior: The Influence of Attitude, Implementation Intention, and

Knowledge," *International Journal of Environmental Research and Public Health*, 18(6), p. 2910. Available at: https://doi.org/10.3390/ijerph18062910.

Wang, N., Tang, L. and Pan, H. (2018) "Analysis of public acceptance of electric vehicles: An empirical study in Shanghai," *Technological Forecasting and Social Change*, 126, pp. 284–291. Available at: https://doi.org/10.1016/j.techfore.2017.09.011.

Wang, S. *et al.* (2018) "Policy implications for promoting the adoption of electric vehicles: Do consumer's knowledge, perceived risk and financial incentive policy matter?," *Transportation Research Part A: Policy and Practice*, 117, pp. 58–69. Available at: https://doi.org/10.1016/j.tra.2018.08.014.

Xu, G. *et al.* (2020) "Moving towards sustainable purchase behavior: examining the determinants of consumers' intentions to adopt electric vehicles," *Environmental Science and Pollution Research*, 27(18), pp. 22535–22546. Available at: https://doi.org/10.1007/s11356-020-08835-9.

Xue, Y. *et al.* (2023) "Effects of incentive policies on the purchase intention of electric vehicles in China: Psychosocial value and family ownership," Energy Policy, 181, p. 113732. Available at: https://doi.org/10.1016/j.enpol.2023.113732.

Xuyen Dong (2025) "Xe máy điện hút khách, Việt Nam trở thành thị trường lớn thứ 3 thế giới", Lao Động. Available at: https://laodong.vn/xe/xe-may-dien-hut-khach-viet-nam-tro-thanh-thi-truong-lon-thu-3-the-gioi-1561426.ldo

Zaino, R. *et al.* (2024) "Electric Vehicle Adoption: A Comprehensive Systematic Review of Technological, Environmental, Organizational and Policy Impacts," *World Electric Vehicle Journal*, 15(8), p. 375. Available at: https://doi.org/10.3390/wevj15080375.

Zeng, S. *et al.* (2022) "Modeling the influence of critical factors on the adoption of green energy technologies," Renewable and Sustainable Energy Reviews, 168, p. 112817. Available at: https://doi.org/10.1016/j.rser.2022.112817.

Zhang, X. *et al.* (2014) "Policy Incentives for the Adoption of Electric Vehicles across Countries," *Sustainability*, 6(11), pp. 8056–8078. Available at: https://doi.org/10.3390/su6118056.

Zhang, X. and Dong, F. (2023) “What affects residents’ behavioral intentions to ban gasoline vehicles? Evidence from an emerging economy,” *Energy*, 263, p. 125716. Available at: https://doi.org/10.1016/j.energy.2022.125716.