

Purchase Intention of Electric Vehicles among Generation Z Consumers in Batam City

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Abstract

Purpose: This study aims to examine the factors influencing Electric Vehicle (EV) purchase intention among Generation Z consumers in Batam City, focusing on perceived risk, perceived value, and government support, with attitude as a mediating variable.

Research Methodology: This study was conducted in Batam, Indonesia, using a quantitative approach. Data were collected through a survey of 461 Generation Z respondents in Indonesia. The study utilized Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 4 software to analyze the relationships between variables.

Results: The findings revealed that attitude is the most dominant factor directly influencing EV purchase intention. Government support and perceived value have a positive and significant effect on attitude, whereas perceived risk does not significantly influence attitude or purchase intention.

Conclusions: The study concludes that building positive attitudes is key to increasing EV purchase intentions among Generation Z. This can be achieved by enhancing perceived value and providing clear and supportive government policies.

Limitations: This study is limited by its geographic focus on Batam, which restricts the generalizability of the findings to other regions with different market dynamics and policy environments. Additionally, the use of cross-sectional data captures consumer perceptions at a single point in time, despite being dynamic.

Contributions: This study contributes to the literature on consumer behavior and sustainable transportation, particularly in developing countries, and provides practical insights for policymakers and industries to accelerate EV adoption among younger consumers.

Keywords: *Government Support, Mediating Role of Attitude, Perceived Risk, Perceived Value, Purchase Intention*

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1. Introduction

The global automotive industry is currently facing a major reset, where higher manufacturing numbers are occurring simultaneously with significant changes in the cost of cars (Xie, An, & Yasir, 2022). In 2024, over 17 million Electric Vehicles (EV) were sold globally, which was more than a 25% increase compared to 2023, and an acceleration in their growth trajectory is expected to continue (IEA, 2025). One of the main drivers of growth is the competitive pricing strategies adopted by Chinese manufacturers, which are lowering market prices (Musofa, 2025). Reflecting this change, Indonesia experienced a 153% increase in EV sales in 2024, with total EV sales reaching 4.98% of the national automotive market (Krisdamarjati, 2024; Rajendra, 2025).

While these growth numbers are impressive, the adoption of EVs in emerging markets like Indonesia is heavily reliant on consumer behavior responses, with awareness being a key determinant of the intention to purchase. According to [Rosenberg, Blondheim, and Sabag-Ben Porat \(2025\)](#), individuals born after 1997 constitute a large consumer segment with distinct characteristics compared to previous generations. They are highly attuned to digital trends, adept at accessing information through social media, and deeply concerned about sustainability and social responsibility ([Djafarova & Fouts, 2022](#)). These traits make them particularly receptive to innovation, especially when it involves advanced technology and sustainability. [Zámečník and Tahal \(2025\)](#) further highlight that Generation Z has now entered a productive life stage, making them key drivers of increasing demand for environmentally friendly and technology-driven products, including EVs. The eco-friendly solutions and advanced technologies offered by EVs align closely with the values and preferences of Generation Z, making them an especially relevant choice for this consumer segment.

Although Generation Z is drawn to Electric Vehicles (EVs) for their eco-friendly solutions and advanced technologies, they face several challenges when deciding whether to adopt EVs ([Lastriany, Sulistiobudi, & Sulastiana, 2022](#)). This generation seeks a combination of technological benefits, the latest features, and strong environmental value. However, significant adoption barriers, such as high perceived vehicle risk and limited government support, present substantial obstacles ([Ehsan et al., 2024](#)). Intense price competition and insufficient infrastructure further complicate young consumers' decisions to switch to EVs. Consequently, Generation Z carefully evaluates the perceived value, perceived risk, and level of government support associated with EV products, weighing whether the long-term benefits justify the potential risks ([Sobiech-Grabka, Stankowska, & Jerzak, 2022](#)). In Indonesia, these regional variations and adoption dynamics are acutely visible in Batam. As a designated Free Trade Zone (FTZ), Batam serves as a unique economic enclave where special tax exemptions directly disrupt traditional automotive pricing, making it a critical entry point for highly competitive Chinese EV models. Consequently, this distinct metropolitan setting provides a highly integrated regulatory and commercial environment perfectly suited for investigating how Generation Z structurally reacts to abrupt price fluctuations, infrastructural preparedness, and institutional programs

Previous studies have examined the factors influencing consumers' purchase intentions for Electric Vehicles (EVs). [Chonsalasin et al. \(2024\)](#) identified that government support through policies, taxation, and services can be a major driver of EV adoption. Additionally, perceived value plays a pivotal role in consumer decisions regarding EV adoption ([Han, Hsu, & Hsu, 2024](#)). However, perceived risk also plays a critical role in the decision-making process for adopting EVs ([Hu, Yusof, & Mansor, 2025](#)). However, the literature presents conflicting findings regarding the direct impact of these variables on purchase intentions. For instance, [Xie et al. \(2022\)](#) reported a significant effect of perceived risk, whereas [Zang, Qian, and Jiang \(2022\)](#) found the effect to be non-significant. These discrepancies suggest that the direct impact of these independent variables on purchase intention is inconclusive. Moreover, research specifically focusing on Generation Z's EV purchase intentions is limited, leaving a gap in understanding the unique factors influencing adoption within this consumer segment.

Although previous studies have demonstrated the direct effects of perceived risk ([Han et al., 2024](#)), perceived value by [Loudiyi, Chetioui, and Lebdaoui \(2022\)](#), and government support by [Limpasirisuwan, Champahom, Jomnonkwao, and Ratanavaraha \(2024\)](#) on purchase intention, few studies have explicitly examined the role of attitude as a mediator in this complex relationship ([Huang & Ge, 2019](#)). Most research tends to focus on the direct impacts of these variables, without analyzing in depth how consumer attitude functions as a bridge connecting perceived risk, perceived value, and government support to purchase intention. Attitude was selected as a mediating variable because it serves as a cognitive and affective bridge that integrates various consumer perceptions and information before they form an intention to act ([Ali & Naushad, 2022](#)).

This study is expected to make significant academic and practical contributions. Academically, this study enriches the literature on consumer behavior and technology adoption by providing a more integrated framework for understanding EV purchase intentions, particularly by examining the mediating role of attitude, which has often been overlooked or yielded inconsistent results in previous

research, with a focus on Generation Z. Practically, the findings will be valuable for EV manufacturers in designing more targeted marketing strategies and developing products aligned with consumer needs and preferences. Additionally, the results can inform policymakers and government agencies in formulating effective incentives and developing infrastructure to accelerate the transition to sustainable transportation in Indonesia.

2. Literature Review and Hypotheses Development

2.1 Government Supports Toward Attitude

Governments play a pivotal role in accelerating the transition to Electric Vehicles (EVs) in various countries. Through various policies and initiatives, they not only shape a supportive market ecosystem but also fundamentally influence how consumers perceive and respond to EV technologies ([Limpasirisuwan et al., 2024](#)). Government support for EV adoption manifests in multiple ways, including financial incentives, charging infrastructure development, regulations, and public education ([Chen, Selamat, & Lee, 2025](#)). From the perspective of Stimulus Organism Response (SOR) theory by [Mehrabian and Russell \(1974\)](#), government interventions act as Stimuli (S) in the environment, such as economic incentives, infrastructure, and educational campaigns. These stimuli influence the Organism (O), representing consumers' internal states, including their attitudes, perceptions of usefulness, trust, and perceived convenience regarding EVs ([Ariyanto, Purwianti, Steven, & Changbo, 2025](#)). For example, financial incentives reduce perceived costs and demonstrate institutional support, positively affecting consumer confidence and perceptions of EV benefits ([Ehsan et al., 2024](#)). Similarly, the development of a robust charging infrastructure addresses the primary concern of consumers regarding access to charging facilities. With the widespread availability of charging stations, EVs have become more practical for daily use, which directly promotes positive attitudes toward ownership and usage ([Lv, Wu, Ren, Zhou, & Li, 2024](#)). Transparent policies, such as well-defined EV adoption targets, non-financial incentives, and government-led information campaigns, enhance consumer trust and understanding ([Limpasirisuwan et al., 2024](#)). Educational initiatives help consumers appreciate the long-term advantages of EVs, clarify misconceptions, and foster more optimistic and accepting attitudes toward EV adoption ([Wolor, Hoo, Hong, Amin, & Liau, 2024](#)).

These internal consumer states influence their responses (R), which manifest as their intention to adopt and use EVs. Previous studies ([Agustina, Yuniaristanto, & Sutopo, 2025](#); [Ehsan et al., 2024](#)) suggest that government support can positively influence consumer attitudes. However, [Ansab and Kumar \(2022\)](#) reported non-significant effects. Therefore, based on the SOR framework and empirical evidence of institutional backing, the following hypothesis is proposed:

H₁: Government Support positively affects Consumer Attitudes

2.2 Perceived Risk Toward Attitude

In consumer behavior, perceived risk refers to the uncertainty that consumers experience regarding possible negative outcomes associated with their purchase decisions ([J. Yang & Peng, 2025](#)). It represents a subjective evaluation of the potential losses or undesired outcomes that may arise from adopting new products, such as Electric Vehicles (EVs) ([Liu, Zhang, & Yang, 2024](#)). In the EV context, perceived risk manifests in several key dimensions. First, cost risk encompasses concerns about the relatively high initial cost of EVs, future battery replacement expenses, maintenance costs, and uncertain resale value ([Xie et al., 2022](#)). Second, performance risk refers to concerns that the EV may not perform as expected, often reflected in "range anxiety," or the fear of a limited battery driving range. Finally, time risk refers to potential time losses due to long charging durations or insufficient charging facilities ([Ariyanto et al., 2025](#)).

Theoretically, a high perceived risk is posited to negatively affect consumer attitudes; when individuals anticipate significant losses, they tend to develop unfavorable psychological evaluations of the technology ([Zou, Kamarudin, Liu, & Zhang, 2024](#)). Empirically, several scholars have confirmed this paradigm, demonstrating that heightened risk perceptions directly inhibit positive attitudes toward EV adoption ([C. Yang, Tu, & Jiang, 2020](#); [Zhao, Furuoka, Rasiah, & Shen, 2024](#)). Conversely, other studies ([Ariyanto et al., 2025](#); [Liu et al., 2024](#); [S. Xu, Hu, & Han, 2025](#); [Zang et al., 2022](#)) reported non-significant findings. This inconsistency can be explained by [Rogers \(2003\)](#) Innovation Diffusion Theory

(IDT), which suggests that as adoption levels increase and consumers gain more information, experience, and evidence of reliability, initial uncertainty (perceived risk) diminishes over time. Beyond the IDT, this conflict is heavily contingent on market maturity and demographic cohorts. Prior studies that yielded significant negative effects were often conducted during early market phases ([Zhao et al., 2024](#)). Conversely, non-significant findings tend to emerge when sampling tech-savvy populations, such as Generation Z. Gen Z, as digital natives, possesses a different risk-processing mechanism. Their high tech-literacy allows them to normalize initial technological drawbacks, viewing performance and time risks as temporary inconveniences rather than as absolute barriers. Therefore, based on the risk-reduction framework of Innovation Diffusion Theory (IDT) and supported by conflicting empirical evidence within evolving markets, the following hypothesis is proposed.

H₂: Perceived Risk negatively affects Consumer Attitudes

2.3 Perceived Value Toward Attitude

In the context of purchase decisions, perceived value refers to consumers' overall assessment of a product or service based on the benefits they believe they receive compared to the costs or sacrifices involved ([Riswanda & Millanyani, 2025](#)). Therefore, perceived value is considered an important predictor of consumer behavior, as it reflects consumers' cognitive and emotional evaluations of the benefits obtained from a product ([Z. Xu & Rojniruttikul, 2025](#)). The perceived value of Electric Vehicles (EVs) can be divided into several dimensions that influence consumer attitudes. The first dimension, utility value, pertains to the functional and practical benefits experienced, such as driving performance, speed, and ease of use in daily activities ([Han et al., 2024](#)). Second, eco-friendly value relates to consumers' perception that EVs contribute positively to the environment, such as through reduced carbon emissions and air pollution ([Maulana & Fathurahman, 2025](#)). Third, hedonic value refers to the pleasure, excitement, or enjoyable experiences derived from EV usage, such as smooth and quiet rides or advanced technological features ([Selvi & Önem, 2025](#)). Finally, image value reflects how EV ownership enhances consumers' self-image or social status, associating them with a modern, innovative, and environmentally conscious lifestyle ([Vishwakarma, 2024](#)).

When consumers perceive Electric Vehicles as offering high value, they are more likely to form favorable attitudes toward them. This is consistent with the core principle of the Theory of Reasoned Action (TRA) ([Fishbein & Ajzen, 1975](#)), in which perceived value functions as a behavioral belief. Beliefs about cost savings, environmental benefits, and high image value are strong behavioral beliefs that directly foster a positive attitude. Previous studies have identified a positive relationship between perceived value and attitude, suggesting that consumers are more likely to develop favorable attitudes when the perceived benefits exceed the associated costs or efforts ([Han et al., 2024](#); [Hu et al., 2025](#); [Loudiyi et al., 2022](#)). Therefore, based on the behavioral belief framework of the Theory of Reasoned Action (TRA) and supported by consistent empirical evidence, the following hypothesis is proposed:

H₃: Perceived Value positively affects Consumer Attitudes

2.4 Attitude Toward Purchase Intention

In consumer behavior studies, attitudes are widely recognized as key predictors of purchase intentions and behaviors ([Indrajaya, Perizade, Wahab, & Shihab, 2023](#)). Attitude is defined as a learned tendency to respond consistently, favorably or unfavorably, to an object, idea, or behavior ([Fishbein & Ajzen, 1975](#)). This concept is fundamental to several consumer behavior models, including the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB), which state that an individual's attitude toward a behavior directly influences their intention to engage in that behavior ([Ajzen, 1991](#)). The TPB establishes that attitude serves as the primary internal mechanism for translating cognitive beliefs into motivational drives. In the context of Electric Vehicles (EVs), an individual's favorable evaluation of behavioral outcomes, such as environmental sustainability or technological modernity, directly dictates the strength of their intent to adopt the technology.

According to [Selvi and Önem \(2025\)](#), consumers' attitudes toward Electric Vehicles (EVs) logically have a significant influence on their purchase intentions. Positive attitudes toward EVs, formed through perceptions of high value, low risk, and government support, substantially contribute to the development of strong purchase intentions. Empirical studies have consistently supported this

relationship. For example, a recent analysis by [Chin, Yu, Tuan, and Tat \(2024\)](#) found that consumer attitudes significantly influenced EV purchase intention. Studies conducted in different geographic contexts further confirm that a positive attitude is a key driver of interest in purchasing EVs ([Zang et al., 2022](#)). Consumers who view the benefits of EVs favorably, perceive ease of use, and feel that EVs align with their lifestyle or values are more likely to have strong purchase intentions. Conversely, neutral or negative attitudes reduce the likelihood of such intentions ([Tu & Yang, 2019](#)). Additional studies ([Hu et al., 2025](#); [S. Xu et al., 2025](#); [J. Yang & Peng, 2025](#)) also report a positive effect of attitude on purchase intention. Therefore, based on the strong theoretical foundations of consumer behavior models and empirical support from multiple studies, the following hypothesis is proposed:

H₄: Consumers' Attitudes positively influence their intention to Purchase Intentions

2.5 Attitude as Mediating

Attitude serves as a central mechanism that links different enabling and inhibiting factors to consumers' purchase intentions, especially for innovative products such as EVs ([Ali & Naushad, 2022](#)). [Khurana, Kumar, and Sidhpuria \(2020\)](#) suggest that attitude functions as both a cognitive and affective filter, helping consumers process information from their environment and their perceptions of a product. Consumers first evaluate factors such as perceived risk, perceived value, and the extent of government support for EV development in their countries ([Han et al., 2024](#)). These evaluations shape whether their attitude toward EVs is positive or negative. Individually, perceived value and government support have positive effects on attitudes, as perceived benefits and policy backing tend to foster more favorable views of EVs ([Ansab & Kumar, 2022](#); [Han et al., 2024](#)). In contrast, perceived risk has a negative impact, as concerns and uncertainties may dampen positive attitudes toward products ([C. Yang et al., 2020](#); [Zhao et al., 2024](#)). The attitudes formed significantly influenced purchase intentions.

Although previous studies have highlighted the direct effects of perceived risk, perceived value, and government support on purchase intention, few have explicitly explored the mediating role of attitude in this complex relationship ([Huang & Ge, 2019](#)). Most research focuses on the direct impacts of these variables without thoroughly investigating how consumer attitudes serve as a bridge connecting perceived risk, perceived value, and government support to purchase intention. Therefore, based on the causal chains established by the TRA and TPB, the following mediation hypotheses are proposed:

H₅: Consumers' Attitudes mediate the relationship between Government Support and Purchase Intention for Electric Vehicles

H₆: Consumers' Attitudes mediate the relationship between Perceived Risk and Purchase Intention for Electric Vehicles

H₇: Consumers' Attitudes mediate the relationship between Perceived Value and Purchase Intention for Electric Vehicles

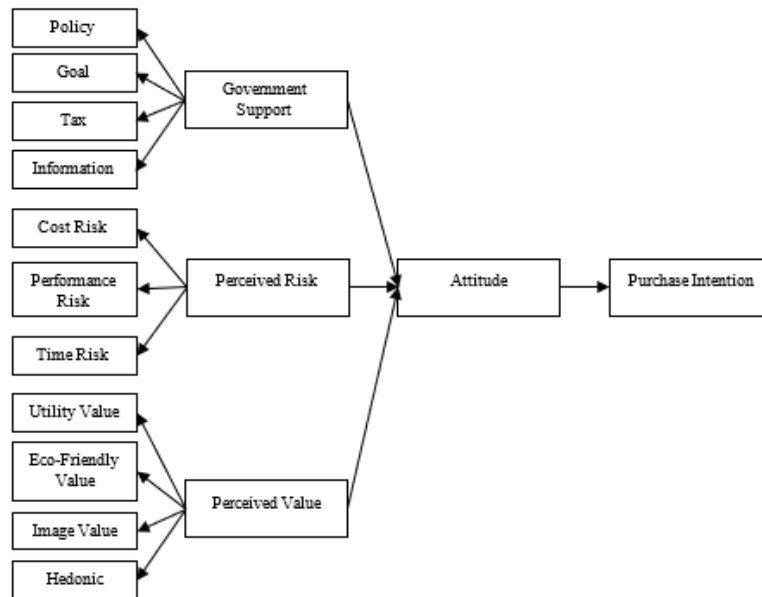


Figure 1. Conceptual framework

Figure 1 shows the conceptual framework underlying this study and the hypothesized relationship between variables.

3. Methodology

This study adopts a quantitative approach with a survey design to investigate the relationships among variables and gather measurable data (Purwianti, Ariyanto, Winata, & Changbo, 2025). Five variables were adopted from previous studies with verified reliability. Government support was measured using four dimensions, with a total of 12 items adapted (Limpasirisuwan et al., 2024). Perceived risk was measured using three dimensions with nine items (Han et al., 2024; Hu et al., 2025). Perceived value was assessed through four dimensions, comprising thirteen items drawn (Selvi & Önem, 2025; Vishwakarma, 2024; Wang, 2022; Zhao et al., 2024). Attitude was measured with five items from (Hu et al., 2025), and purchase intention was measured with four items from (Triopsakul, 2024). All variables were assessed using a five-point Likert scale.

To establish the minimum sample size, this study followed the guidelines of Hair et al. (2022), who recommended that the number of respondents be at least ten times the total number of questionnaire items. Based on this guideline, data were collected from 461 respondents in the sample. Data collection will be conducted from June to October 2025. The study focused on Batam City because of its status as a Free Trade Zone (FTZ), which creates unique EV market dynamics in terms of local policy incentives, vehicle pricing structures, and infrastructure development, providing an opportunity for in-depth and contextually relevant exploration.

Primary data were collected using a Google Forms questionnaire distributed to Generation Z consumers interested in EV adoption. This online approach was suitable because it reduced response fatigue, reached respondents across Batam City, and enabled the automated screening of eligible participants. This study adopted a cross-sectional design, gathering data at a single point in time or within a relatively short period (Roy, 2023). Data analysis was conducted using SmartPLS 4 to estimate a variance-based structural equation model oriented toward predictive capabilities. Dimensional constructs were tested using a second-order method with a repeated indicator approach, as recommended by Becker, Cheah, Ringle, Sarstedt, and Hair (2019). To ensure statistical reliability and accuracy of hypothesis testing, the research model underwent a systematic evaluation of both data quality and model structure. Preliminary testing included a multicollinearity assessment using the Variance Inflation Factor ($VIF < 5$) as an indicator of regression model feasibility. The outer model was assessed to ensure the validity and reliability of the measurement instruments, including indicator reliability (factor loading ≥ 0.70),

internal consistency reliability (Composite Reliability, $CR \geq 0.70$), convergent validity (Average Variance Extracted, $AVE \geq 0.50$), and discriminant validity using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio ($HTMT < 0.85-0.90$). The inner model was evaluated by examining the R-squared (R^2) values and path effect sizes (f^2), with path coefficient inference conducted through bootstrapping procedures.

4. Results and Discussions

Data collected from 461 respondents were analyzed to examine the relationships among the study variables: attitude, purchase intention, perceived risk, perceived value, and government support. The data were processed and screened to ensure that they met the sample criteria, focusing specifically on Generation Z individuals. The analysis included descriptive statistics, validity and reliability testing, and structural model assessment, which were conducted using SmartPLS 4. Table 1 presents detailed demographic information of the respondents.

Table 1. Statistic descriptive

Category	Subcategory	Frequency	Percentage (%)
Gender	Female	264	57.27
	Male	197	42.73
Education	≤Highschool	196	42.52
	≥Bachelor Degree	265	57.48
Generation	Gen Z	461	100
Income	< 7,000.000	365	79.18
	7,000.000 – 12,000.000	83	18.00
	12,000.000 – 20,000.000	7	1.52
	20,000.000 – 30,000.000	0	0.00
	>30,000.000	6	1.30

Based on the analysis of 461 respondents, the socio-demographic profile of this study revealed relatively homogeneous characteristics, with a focus on a specific segment. Regarding gender, the majority of respondents were female (264 individuals, 57.27%), while males accounted for 197 (42.73%). In terms of education, the majority held at least a bachelor's degree (265 respondents, 57.48%), while 196 respondents (42.52%) had a high school education or less. This study exclusively focused on Generation Z participants.

In terms of monthly income, most respondents (365 individuals, 79.18%) earned less than IDR 7,000.000. followed by 83 respondents (18.00%) with incomes between IDR 7,000.000 and IDR 12,000.000. and only 13 respondents (2.82%) earned above IDR 12,000.000. This profile indicates that the sample consisted mainly of highly educated Generation Z individuals with lower-to middle-level incomes. These findings suggest that the perceptions and behaviors analyzed in this study primarily reflect the characteristics of young, educated consumers with moderate purchasing power, which is particularly relevant in the context of consumer behavior analysis in Indonesia.

To confirm that multicollinearity was not present among the indicators, a collinearity test was performed using the Variance Inflation Factor (VIF). The results indicated that all VIF values ranged from 1.120 to 2.816, remaining well below the recommended threshold of 5.0 (Hair et al., 2022). This indicates that there is no high correlation among indicators within the same construct, confirming that the measurement model is free of multicollinearity issues. Therefore, each indicator can be considered statistically independent and contributes uniquely to its respective latent construct.

Table 2. Convergent validity test

Constructs	Dimension	Indicators	Factor loadings	Composite Reability (CR)	Average Variance Extracted (AVE)
Purchase Intention	PI	PI1	0.748	0.907	0.711
		PI2	0.873		
		PI3	0.900		
		PI4	0.829		
Attitude	AT	AT2	0.778	0.889	0.668
		AT3	0.863		
		AT4	0.745		
		AT5	0.869		
Government Support	PO	PO1	0.855	0.842	0.574
		PO2	0.794		
		PO3	0.818		
	GO	GO1	0.859		
		GO2	0.903		
	TX	TX1	0.746		
		TX2	0.715		
		TX3	0.752		
	IF	IF1	0.768		
IF2		0.819			
IF3		0.830			
Perceived Risk	CR	CR2	0.793	0.763	0.529
		CR3	0.872		
	PR	PR1	0.796		
		PR2	0.702		
		PR3	0.810		
	TR	TR1	0.799		
		TR2	0.753		
TR3		0.851			
Perceived Value	UV	UV1	0.787	0.833	0.560
		UV2	0.877		
		UV3	0.784		
	EF	EF1	0.835		
		EF2	0.870		
		EF3	0.808		
	IV	IV1	0.837		
		IV2	0.857		
		IV3	0.825		
	HV	HV1	0.856		
HV2		0.894			
HV3		0.780			

To confirm convergent validity, this study evaluated how consistently the observed indicators represented their respective latent constructs. This assessment was based on three key criteria, such as factor loadings, Composite Reliability (CR), and Average Variance Extracted (AVE). As presented in Table 2, all indicators had factor loadings above 0.70, demonstrating that each indicator strongly contributed to its corresponding construct (Hair et al., 2022). The Composite Reliability (CR) values for all constructs ranged from 0.763 to 0.907, surpassing the minimum threshold of 0.70, indicating satisfactory internal consistency. The Average Variance Extracted (AVE) values ranged from 0.529 to 0.711, confirming that each construct explained more than 50% of the variance in its indicators. According to the criteria proposed by Fornell and Larcker (1981), these results indicate that all the

constructs in the model satisfy the requirements for convergent validity. Therefore, the measurement model is deemed valid and reliable in representing the constructs of purchase intention, attitude, government support, perceived risk, and value.

Table 3. Heterotrait-Monotrait Ratio of Correlations (HTMT)

Variables	Attitude	Government Support	Perceived Risk	Perceived Value	Purchase Intention
Attitude					
Government Support	0.668				
Perceived Risk	0.259	0.401			
Perceived Value	0.793	0.679	0.373		
Purchase Intention	0.854	0.618	0.156	0.661	

To ensure discriminant validity, this study examined whether each construct in the model was distinct and captured a concept different from the others. This assessment was conducted using two primary methods: the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) Ratio of Correlations. Based on the HTMT results presented in Table 3, all inter-construct correlations were below the 0.90 threshold ([Henseler, Ringle, & Sarstedt, 2015](#)). The highest HTMT value was observed between purchase intention and attitude (0.854), followed by perceived value and attitude (0.793). All other values, including those involving perceived risk, remained significantly below the threshold. These findings indicate that each construct demonstrated adequate discriminant validity and that there was no conceptual multicollinearity among the latent variables.

Table 4. Fornell-Larcker criterion supports

Variables	Attitude	Government Support	Perceived Risk	Perceived Value	Purchase Intention
Attitude	0.816				
Government Support	0.550	0.612			
Perceived Risk	0.178	0.235	0.570		
Perceived Value	0.692	0.574	0.257	0.625	
Purchase Intention	0.725	0.514	0.078	0.582	0.839

Furthermore, the Fornell-Larcker criterion supports these results. As presented in Table 4, the square roots of the AVE for each construct are greater than the correlations with the other constructs. For example, the square root of the AVE for the purchase intention construct was 0.839, exceeding its correlations with other constructs, including attitude (0.816) and perceived value (0.625). A similar pattern was observed for all other constructs, each satisfying the Fornell-Larcker criterion ([Fornell & Larcker, 1981](#)). Therefore, based on both evaluation approaches, it can be concluded that the measurement model exhibits strong discriminant validity, confirming that each construct represents a distinct concept while remaining theoretically related.

Table 5. R-Square analysis

Variables	R-square	R-square adjusted
Attitude	0.513	0.510
Purchase Intention	0.526	0.525

Table 5 shows the R-squared (R^2) analysis revealed that the construct attitude had an R^2 value of 0.513 and purchase intention had an R^2 value of 0.526. This means that 51.3% of the variance in attitude is explained by the independent constructs, including government support, perceived risk, and perceived value, while 52.6% of the variance in purchase intention is accounted for by attitude and the other

factors in the model. According to the guidelines of (Hair et al., 2022), R² values around 0.50 are considered moderate, suggesting that the structural model demonstrates good explanatory power.

Table 6. F-square analysis

Relationship	F-square
Attitude →Purchase Intention	1,108
Government Support →Attitude	0.072
Perceived Risk →Attitude	0.001
Perceived Value → Attitude	0.429

Table 6 shows the effect size (f²) analysis indicated considerable variation in the strength of the relationships among the constructs in the model. The largest effect was observed for the relationship between attitude and purchase intention, with an f² value of 1.108, categorized as a "large effect" according to Cohen (1988), which highlights the strong influence of attitude on purchase intention. Perceived value had a moderate effect (f² = 0.429) on attitude, emphasizing the significant role of perceived value in shaping consumer attitudes. In contrast, government support had a small effect (f² = 0.072), whereas perceived risk had a negligible effect (f² = 0.001).

Table 7. Hypotheses testing

Hypotheses	Path	SDEV	T-value	P-value	Supported
H ₁	GS →ATT	0.048	4.832	0.000	Yes
H ₂	PR → ATT	0.035	0.599	0.549	No
H ₃	PV→ATT	0.042	13.553	0.000	Yes
H ₄	ATT → PI	0.028	25.820	0.000	Yes
H ₅	GS → ATT → PI	0.036	4,621	0.000	Yes
H ₆	PR→ ATT→ PI	0.025	0.598	0.550	No
H ₇	PV → ATT → PI	0.035	11,595	0.000	Yes

Table 7 shows the hypotheses testing results indicate that most relationships among the variables in the research model are statistically significant, demonstrating strong direct and indirect connections among the key factors affecting Electric Vehicle (EV) adoption in Taiwan.

H₁ was supported, showing that government support has a positive and significant effect on attitudes ($\beta = 0.048$, $t = 4.832$, $p < 0.001$). This result underscores the important role of government interventions, including subsidies, tax incentives, registration fee reductions, and the development of charging infrastructure, in fostering consumers' positive attitudes toward EVs. Such support provides reassurance that EVs are economically viable, efficient, and sustainable. For Generation Z, who are sensitive to upfront costs but are highly aware of sustainability issues, financial incentives and reliable infrastructure directly mitigate economic barriers. From the perspective of Stimulus Organism Response (SOR) theory, these government initiatives act as Stimuli (S) that influence consumers' internal states Organism (O), such as attitudes, perceptions of convenience, and trust in EV technology. Positive changes in these internal states drive the Response (R), resulting in a more favorable attitude toward adopting EVs (Ariyanto et al., 2025). These findings align with prior research by Agustina et al. (2025) and Ehsan et al. (2024), emphasizing that government interventions can accelerate the adoption of eco-friendly vehicles by reducing costs and technological adoption barriers.

H₂ was not supported, as perceived risk did not significantly affect attitude ($\beta = 0.035$, $t = 0.599$, $p = 0.549$). This indicates that consumer concerns about technological risks, such as limited driving range, battery replacement costs, or charging system reliability, are no longer the primary determinants of attitudes toward EVs. This outcome is consistent with the Innovation Diffusion Theory (Rogers, 2003), which posits that as adoption increases and consumers gain experience and information, initial uncertainties (perceived risks) diminish. Among Generation Z, who are highly technologically literate

and quick to adopt new innovations, perceived risks are further mitigated by increased public confidence in automotive technology and strong governmental support. These findings are also consistent with [Ariyanto et al. \(2025\)](#), [Liu et al. \(2024\)](#), [S. Xu et al. \(2025\)](#), and [Zang et al. \(2022\)](#) which reported non-significant effects of perceived risk on attitude in the context of EV adoption.

H_3 was supported, demonstrating that perceived value positively and significantly influenced attitude ($\beta = 0.035$, $t = 13.553$, $p < 0.001$). High consumer evaluations of EV benefits, such as energy efficiency, cost savings, and sustainability, are positively associated with attitudes toward EVs. For Generation Z, perceived value is particularly vital, as EVs offer a combination of economic benefits (low operating costs) and environmental value (eco-friendly attributes) that align with their moderate purchasing power and sustainability-oriented value. This finding aligns with the Theory of Reasoned Action ([Fishbein & Ajzen, 1975](#)), which states that attitudes are shaped by behavioral beliefs regarding the consequences of a behavior. Positive evaluations of EV benefits function as strong behavioral beliefs that directly generate favorable attitudes. These results are consistent with [Han et al. \(2024\)](#), who emphasized the central role of perceived value in shaping attitudes and behavioral intentions toward innovative products.

H_4 was supported, indicating that attitude had the most dominant effect on purchase intention ($\beta = 0.028$, $t = 25.820$, $p < 0.001$). Positive consumer attitudes toward EVs are the main drivers of purchase intention. When consumers view EVs as valuable, environmentally friendly, and consistent with their personal identity, their intention to purchase these vehicles increases substantially. These findings support the Theory of Planned Behavior ([Ajzen, 1991](#)), which identifies attitude as a direct predictor of behavioral intentions. For Generation Z, positive attitudes are influenced not only by functional benefits but also by symbolic values reflecting sustainable lifestyles and the adoption of advanced technology, which are central to their social identity. Previous studies by [Hu et al. \(2025\)](#), [S. Xu et al. \(2025\)](#), and [J. Yang and Peng \(2025\)](#) also reported significant positive effects in this relationship.

Mediation analysis further revealed that H_5 was supported ($\beta = 0.036$, $t = 4.621$, $p < 0.001$), indicating that government support indirectly enhances purchase intention by forming positive attitudes toward EVs. Government interventions, such as subsidies, infrastructure, and regulatory measures, function not only as direct stimuli but also as mechanisms that strengthen purchase intentions by fostering positive perceptions and confidence in EV viability. For Generation Z, often constrained by unstable incomes, such incentives reduce financial barriers and validate their purchase decisions, psychologically reinforcing their attitudes. This finding aligns with [Ansab and Kumar \(2022\)](#), who examined the mediating role of attitude in the relationship between government support and purchase intentions.

In contrast, H_6 was not supported ($\beta = 0.025$, $t = 0.598$, $p = 0.550$), as perceived risk did not significantly influence purchase intention via attitude. This reinforces the earlier H_2 finding that perceived risk is no longer a primary determinant of attitude in the EV market. For Generation Z, although some risk concerns remain (e.g., range anxiety or battery costs), these concerns are not strong enough to negatively shape attitudes and suppress purchase intention. Positive factors, such as government support and perceived value (H_1 and H_3), effectively mitigated and outweighed the influence of perceived risk.

Finally, H_7 was supported ($\beta = 0.035$, $t = 11.595$, $p < 0.001$), indicating that a high perceived value indirectly enhances purchase intention by fostering positive attitudes. Consumers who acknowledge the overall benefits of EVs, including cost savings, efficiency, and environmental advantages, form strongly supportive attitudes that drive their purchase intentions. For Generation Z, this result is particularly important, demonstrating that perceived value, especially the combination of economic and environmental benefits, acts as a cognitive trigger that translates into positive attitudes toward sustainable fashion. These findings are consistent with [Han et al. \(2024\)](#) and [Hu et al. \(2025\)](#), who reported that perceived value positively influences attitude, and that attitude subsequently enhances purchase intention. These findings provide practical insights for policymakers and manufacturers. For policymakers, the results emphasize the importance of maintaining government support, including subsidies, tax incentives, and the expansion of charging infrastructure, to reinforce positive attitudes and encourage purchase intentions among Generation Z consumers. Emphasizing programs that

highlight both economic and environmental benefits can increase adoption rates. For manufacturers, this study emphasizes the need to communicate the tangible value of EVs, including energy efficiency, cost savings, and sustainability, while aligning marketing strategies with the lifestyle and identity values of Generation Z. By designing products and campaigns that focus on perceived value and leverage government support, manufacturers can effectively reinforce positive attitudes and translate them into higher purchase intentions.

5. Conclusions

5.1. Conclusion

This study aimed to examine the impact of perceived risk, perceived value, and government support on consumers' intention to purchase Electric Vehicles (EVs) while examining the mediating role of attitude. The analysis of 461 respondents in Batam provides valuable insights into the mechanisms driving EV purchase intentions. The main findings indicate that attitude ($t = 25.820$) is the strongest predictor, directly influencing purchase intention, thereby reaffirming the principles of the Theory of Planned Behavior (TPB). Government support and perceived value were found to be significant drivers of attitude formation (H_1 and H_3 supported), consistent with the frameworks of SOR Theory and the Theory of Reasoned Action (TRA). Conversely, perceived risk was not significant (H_2 and H_6 rejected), suggesting that concerns about risk have been mitigated by technological advancements and external support, in line with the Innovation Diffusion Theory (IDT). The role of attitude was confirmed as an essential mediator (H_5 and H_7 supported), channeling the positive influence of government support and perceived value on purchase intention. These findings suggest that efforts to promote EV adoption should focus on fostering positive consumer attitudes, which are driven by high perceived value and robust government support rather than concerns about risk.

These findings provide actionable insights for stakeholders. Policymakers in Batam can enhance EV adoption by implementing or expanding subsidies, tax incentives, and investing in charging infrastructure, as these measures strengthen positive consumer attitudes and reduce economic barriers. Awareness campaigns that communicate the economic and environmental benefits of EVs could further increase adoption rates among Generation Z. For manufacturers, emphasizing the tangible value of EVs, including energy efficiency, cost savings, and eco-friendly attributes, in marketing strategies can reinforce favorable attitudes and convert them into purchase intentions. Collaboration with government programs to highlight available incentives can also enhance consumer confidence and drive sales.

5.2. Research Limitations

Several limitations were identified in this study, offering important pathways for further exploration. The primary limitations are as follows: First, the study's focus on Batam restricts the generalizability of the findings to other regions with different market conditions and policy contexts. Second, the reliance on cross-sectional data reflects consumer perceptions at a single point in time, despite the fact that these perceptions are inherently dynamic and may evolve over time.

5.3 Suggestions and Directions for Future Research

Future research could expand this study to other major cities in Indonesia to allow cross-regional comparisons and examine how local policy variations affect adoption. Adopting a longitudinal design would also allow for tracking changes in attitudes and policy impacts over time. Additionally, exploring the role of Green Trust as a potential mediating variable between value-related factors and attitudes could deepen our understanding of how consumers' environmental trust influences EV adoption. Researchers could also examine how tailored marketing messages for different Generation Z segments affect perceived value and attitudes toward EVs, providing guidance for both public and private sector strategies.

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Author Contributions

LP conceptualized the study and drafted the manuscript. WW designed the study and collected the data. HH and EYP performed the data analysis, carefully reviewed and revised the manuscript, and approved the final version. All authors participated in the study, contributed to the manuscript, and have reviewed and approved the final version.

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