The Influence of Product Innovation, Green Products, And Promotion on Buying Intention for Electric Cars

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ABSTRACT

This research aims to analyze the influence of product innovation, green products, and promotion on consumer purchase decisions, with a particular emphasis on the case of electric cars. This research employs a quantitative approach, collecting data through questionnaires that involve 102 respondents. Data analysis was carried out using SmartPLS 4 software, which is based on Partial Least Squares Structural Equation Modeling (PLS-SEM). The analysis process involves a measurement model to connect indicators with the measured constructs, as well as a structural model to test relationships between constructs. The research results show that green products and promotions have a significant positive influence on purchase decisions. Product innovation does not show a significant influence. This has implications for marketing strategies, particularly in increasing the attractiveness of green products and promotions to encourage the purchase of electric cars. This research also focuses on three main variables and a quantitative approach that delves deeper into consumers' subjective perceptions. Therefore, it is recommended that further research be conducted by incorporating additional variables, such as brand loyalty and price, and employing a mixed-methods approach for more comprehensive insights.

INTRODUCTION

Electric vehicles (EVs) are emerging as a pivotal trend in reducing carbon emissions and fostering environmental sustainability, integrating into daily life to reflect eco-conscious behaviors and influencing societal shopping patterns toward a greener culture. However, despite these benefits, EV adoption remains limited in markets like Indonesia due to challenges such as high initial costs, inadequate charging infrastructure, and varying consumer perceptions of value. This research is conducted to examine the factors driving purchase decisions for EVs, explicitly focusing on product innovation, green attributes, and promotional strategies, providing insights for manufacturers like BYD to enhance market penetration and support sustainable transportation initiatives.

State of the art: Recent studies have explored similar influences on EV purchase intentions. For instance, a 2025 study on consumers' motivations for EV purchases highlighted attitudes, perceived behavioral control, moral norms, and subjective norms as key determinants. Another 2025 study analyzed the impact of green marketing and greenwashing on consumer trust and the purchase of electric cars, highlighting the role of eco-friendly perceptions. A 2021 investigation into barriers to green EV adoption used a modified technology acceptance model to identify technological and environmental considerations as significant influencers. Additionally, a 2023 study applied the stimulus-organism-response model and

theory of consumption values to predict hybrid EV purchase intentions, incorporating factors like promotion and innovation. A 2022 paper examined how innovation characteristics and perceived risks impact EV purchase intentions. Furthermore, research from 2022 investigated emotional influences on EV purchases, noting the role of subjective norms. These studies, drawn from journals like ScienceDirect, MDPI, and Frontiers (2015-2025), underscore the growing body of literature on sustainable vehicle adoption.

Gap analysis: While prior research addresses individual aspects such as green marketing or innovation in EV contexts, often in developed markets, there is a notable gap in integrating product innovation, green products, and promotion specifically for EVs in emerging economies like Indonesia. The novelty of this study lies in its focus on psychosocial benefits alongside functional ones, using an Indonesian sample, and offers unique insights into local consumer behavior amid rapid sustainability shifts, which is crucial for tailoring effective strategies in underrepresented regions.

The hypotheses are as follows: Product innovation has a positive and significant influence on consumer purchase decisions for electric car products. Green product has a positive and significant influence on consumer purchase decisions for electric car products. Promotion has a positive and significant influence on consumer purchase decisions for electric car products.

The approach to problem-solving involves a quantitative method, specifically Partial Least Squares Structural Equation Modeling (PLS-SEM), to test relationships between variables. The research objectives are to analyze the influences of product innovation, green products, and promotion on EV purchase decisions, expecting green products and promotion to exert significant positive effects while innovation may not, ultimately recommending enhanced eco-focused marketing and further variables like brand loyalty for a deeper understanding. The following is the conceptual framework and hypotheses proposed in this research;
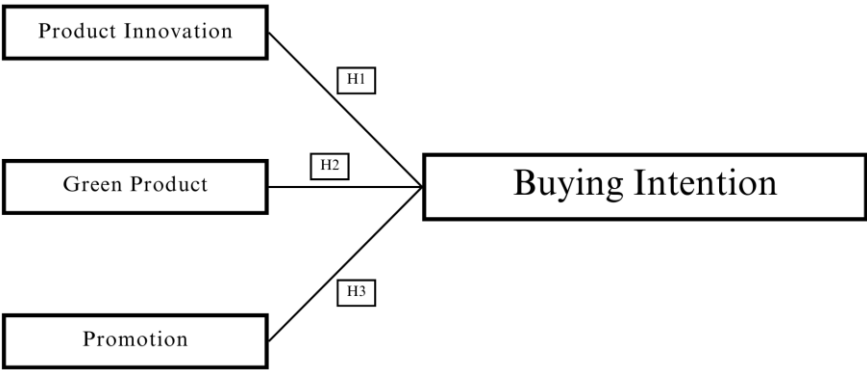

Figure 1. Framework Draft Study

H1: *Product innovation has a positive and significant influence on consumer buying intention for electric car products.*

H2: *The green product has a positive and significant influence on consumer buying intentions for electric car products.*

H3: *Promotion has a positive and significant influence on consumer buying intention for electric car products.*

RESEARCH METHOD

This research employs a quantitative approach, analyzed through statistical methods, to identify meaningful patterns and relationships. Identifying one variable with another. Sampling technique using a non-probability sampling method, specifically the accidental sampling approach, which involves selecting samples that are not intentionally chosen but instead in accordance with the research's characteristics and objectives. The sample size consists of 100 respondents. In this research, the data collected through questionnaires will be analyzed using SmartPLS 4 software, a tool based on Partial Least Squares Structural Equation Modeling (PLS-SEM), which enables researchers to test and model complex relationships between variables. The data analysis process begins with entering respondent data into SmartPLS 4, where researchers will define measurement models and structural models. The measurement model explains the relationship between indicators (questionnaire items) and the measured construct, while the structural model describes the relationships between the constructs.
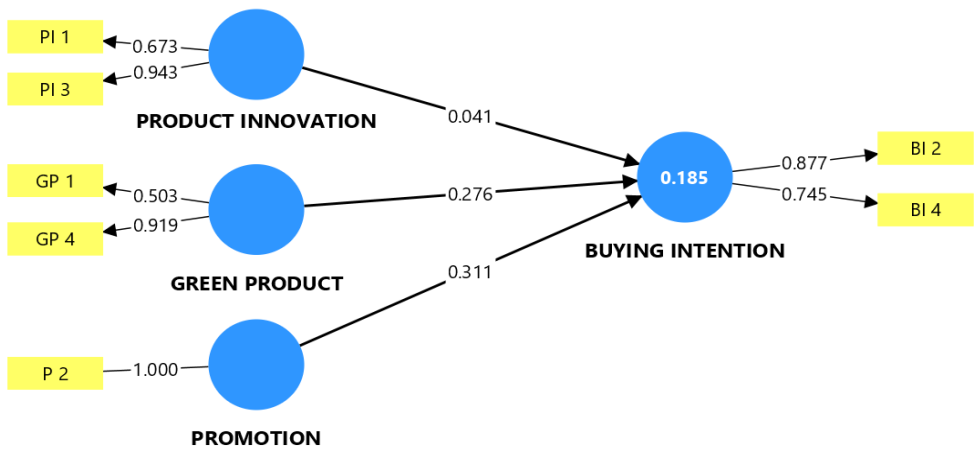
RESULTS AND DISCUSSION

Figure 2. Testing Validity based on Loading Factor

Table 1. Testing Validity Based on Loading Factor

	Outer Loadings	AVE	Composite Reliability
PI 1	0.673		
PI 3	0.943	0.671	0.799
GP 1	0.503		
GP 4	0.919	0.549	0.691
P 2	1.000	1.000	
BI 2	0.877		
BI 4	0745	0.662	0.796

Source Data: 2025 Data Processing Results.

In Figure 2 and Table 1 above, it is shown that all variables in the Research have passed the validity test based on the loading factors. From the results, several statements were found that needed to be deleted, namely PI2, PI4, GP2, GP3, P1, P3, P4, BI1, and BI3. The deletion of these statements is necessary because they do not meet the condition of the outer loading value, where each indicator should have a value greater than 0.6. The deletion of these statements affects the AVE value of each indicator, resulting in values greater than 0.5. Then, every variable in the Composite Reliability has a value greater than 0.7. The conclusion is that, overall, the variables in the Research have a high level of reliability.

Table 2. R Square

	R - Square	R - Square Adjusted
BI	0.185	0.160

Based on Table 2, R Square results show the BI variable value is 0.185, which means Product Innovation, Green Product, Promotion, 18.5% on Buying Decisions (BI)

Table 3. Path Coefficient

	Original Sample (O)	Sample mean (M)	Standard Deviation (STDEV)	T statistics (O/STDEV)	P values
PI > BI	0.041	0.066	0.105	0.388	0.698
GP > BI	0.276	0.283	0.096	2.868	0.004
P > BI	0.302	0.302	0.112	2.763	0.006

In Table 3, the results from the Path Coefficient show that product innovation on purchase decisions (PI>BI) has an original sample value of 0.041, with a t-statistic value of 0.388 (<1.96) with a p-value of 0.698 (>0.05), which means that product innovation has a positive but not significant influence on purchase decisions. Then, the green product variable on purchase decisions (GP > BI) has an original sample value of 0.276, with a t-statistic value of 2.868 (>1.96) and a p-value of 0.004 (<0.05), indicating that the green product has a positive and significant influence on purchase decisions. Then, the promotion on purchase decisions (P > BI) has an original sample value of 0.311, with a t-statistic value of 2.763 (>1.96) and a p-value of 0.006 (<0.05), indicating that promotion has a positive and significant influence on purchase decisions.

Discussion

The Influence of Product Innovation on Purchase Decisions.

Looking at the results from the t-statistic, which shows a value of 0.388 (<1.96) and a p-value of 0.698 (>0.05), it indicates that Product Innovation has a positive but non-significant influence on Purchase Decisions. If the product innovation in electric cars is better, it will undoubtedly influence consumers' purchase decisions. However, in this Research, it is not significant, possibly because consumers focus more on environmental aspects than innovation alone.

The Influence of Green Product on Purchase Decisions.

Looking at the results from the t-statistic, which shows a value of 2.868 (>1.96) and a p-value of 0.004 (<0.05), it has been shown that Green Product is proven to have a significant positive influence on Purchase Decisions. If electric cars offer eco-friendly features that align with customer interests, then customers will choose electric cars over their competitors selling similar products.

The Influence of Promotion on Purchase Decisions.

Looking at the results from the t-statistic, which shows a value of 2.763 (>1.96) and a p-value of 0.006 (<0.05), it has been shown that Promotion is proven to have a positive, significant influence on Purchase Decisions. Sometimes, consumers do not only focus on green products; some prioritize other aspects, such as attractive promotions, without ignoring the product's quality.

CONCLUSION

This study investigated the impact of product innovation, green product attributes, and promotion on consumer purchasing decisions for electric cars in Indonesia, employing a quantitative PLS-SEM approach with 100 respondents. The results reveal that green product ($\beta = 0.276$, p = 0.004) and promotion ($\beta = 0.311$, p = 0.006) have positive and significant effects, supporting Hypotheses 2 and 3. Conversely, product innovation ($\beta = 0.041$, p = 0.698) shows a positive but non-significant influence, rejecting H1. Overall, the model explains 18.5% of the variance in purchase decisions ($R^2 = 0.185$), indicating moderate predictive power and highlighting the dominance of sustainability and marketing efforts in this emerging market.

These findings confirm the theoretical foundations presented by Kotler and Keller (2016) on consumer behavior, which posits that decisions are shaped by perceived value and external stimuli. The significance of green products underscores the shift toward eco-conscious consumption, as noted by Ottman (2011), while the role of promotion emphasizes the need for effective communication in overcoming adoption barriers. However, the non-significance of innovation suggests it may act as a hygiene factor rather than a differentiator, possibly due to consumers' focus on immediate environmental and economic benefits. Managerially, the results offer actionable insights for electric car manufacturers like BYD. Prioritizing green features, such as recyclable materials and zero-emission technology, can enhance appeal, especially amid Indonesia's push for sustainable transportation. Complementing this with robust promotions, including digital ads and incentives, can accelerate market penetration. Policymakers might leverage these insights to design subsidies that amplify green and promotional effects.

The sample size (100) and accidental sampling method may limit generalizability, particularly beyond urban Indonesian consumers. The low R^2 indicates that other unexamined variables (e.g., price, infrastructure availability) could influence decisions. Additionally, the quantitative focus captures perceptions but not deeper motivations; qualitative methods could provide richer insights. For future research, expanding the model to include moderators, such as income level, or mediators, like brand trust, is recommended. Comparative studies across regions or vehicle types (e.g., hybrids vs. full electrics) could further validate findings. A mixed-methods approach, combining surveys with interviews, would provide a more comprehensive understanding of the dynamics of electric car adoption. Ultimately, this research contributes to the literature on sustainable marketing, providing guidance on strategies to promote greener transportation choices.

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