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How Green Product Innovation Strengthens the Link Between Brand Image and Purchase Decisions

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ABSTRACT

The development of eco-friendly products has shown significant growth in line with increasing consumer awareness of sustainability issues. However, the effectiveness of green marketing in driving purchase decisions still shows inconsistent empirical findings, particularly among the Generation Z segment in Indonesia. This study aims to analyze the influence of green marketing on purchase decisions, with the mediating role of green brand image and the moderating role of green product innovation. The study employs a quantitative approach with an explanatory research design. Respondents were Generation Z individuals who had previously purchased eco-friendly products, selected using purposive sampling. Data were collected via a 1–5 Likert-scale questionnaire and analyzed using Partial Least Squares-based Structural Equation Modeling (SEM-PLS). The results indicate that green marketing has a significant effect on green brand image but does not have a direct effect on purchase decisions. Furthermore, green brand image also does not have a significant effect on purchase decisions and thus fails to mediate the relationship between green marketing and purchase decisions. Other findings indicate that green product innovation does not moderate the relationship between green marketing and green brand image. However, green product innovation was found to strengthen the influence of green marketing on purchase decision as well as the influence of green brand image on purchase decision. This study confirms that Gen Z consumers' purchase decisions are not only influenced by green marketing communication but also require tangible evidence through credible eco-friendly product innovations.

Keywords: Green Marketing; Green Brand Image; Green Product Innovation; Purchase Decision.

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INTRODUCTION

The transition toward a sustainable economy has become a global strategic agenda since the commitment to sustainable development was reinforced by the United Nations through the Sustainable Development Goals (Anderson et al., 2021; Filho et al., 2025). Companies are no longer evaluated solely based on profitability but also on their contribution to environmental sustainability (Ahmad et al., 2023; Chen et al., 2023; Shmelev & Gilardi, 2025). Regulatory pressure, consumer activism, and shifting market

preferences are driving corporations to integrate sustainability principles into their core business strategies (Sadiq et al., 2025; Vergara & Agudo, 2021). Globally, the growth of green products shows a positive trend. Consumers are becoming increasingly aware of the environmental impact of their consumption (Lopes et al., 2024; Nga & Tam, 2024). They seek products with eco-labels, biodegradable packaging, low carbon footprints, and ethical production processes (Potter et al., 2021; Taillie et al., 2024) . This shift is not merely a temporary trend but a paradigm shift in consumption (Agarwal et al., 2025; Kenny et al., 2023).

In Indonesia, the green product phenomenon has grown significantly over the past decade. Both local and multinational brands are racing to adopt eco-friendly positioning. Organic products, sustainable fashion, electric vehicles, and recycled products are increasingly easy to find in the market. However, this trend has also sparked consumer skepticism due to greenwashing practices (Adamkiewicz et al., 2022). Green claims not backed by tangible innovation risk undermining brand credibility (Janz et al., 2024; Timmons et al., 2024). Generation Z plays a key role in this landscape. As a digitally native and socially conscious generation, Gen Z possesses a relatively high level of environmental awareness. They evaluate products not only from a functional perspective but also in terms of moral values and sustainability (Adamkiewicz et al., 2022; Bladt et al., 2023). However, the literature indicates that a gap between pro-environmental attitudes and actual purchasing behavior still exists (Margariti et al., 2024; Ogiemwonyi, 2023). This means that verbal commitments to the environment do not necessarily translate into purchasing decisions.

From an academic perspective, the relationship between green marketing and purchase decisions yields inconclusive results (Baca & Reshidi, 2025; Sharma, 2021). Some studies find a significant direct effect, while others suggest that such effects depend on prior brand perception formation (Baca & Reshidi, 2025; Guerreiro & Pacheco, 2021). Furthermore, research integrating the role of green product innovation as a contingency factor that strengthens the credibility of green marketing strategies remains limited (Huang et al., 2024; Lavuri et al., 2022).

This study offers a more comprehensive conceptual model by simultaneously testing mediation and moderation mechanisms. Green Brand Image is positioned as a psychological mechanism explaining how green marketing translates into purchase decisions. Meanwhile, Green Product Innovation is tested as a variable that strengthens the credibility of green claims, thereby minimizing perceptions of greenwashing. This study is significant because it makes a theoretical contribution by strengthening signaling theory and the resource-based view within the context of sustainability marketing. Practically, this study provides strategic guidance for companies to ensure that investments in green marketing align with tangible product innovation, thereby generating a real impact on Generation Z's purchase decisions. Without credible innovation integration, green marketing risks becoming a promotional expense without strategic leverage. This study is designed to address these issues empirically.

LITERATURE REVIEW

Green Marketing and Green Brand Image

Green marketing is a marketing strategy that emphasizes a company's commitment to environmental protection through its products, communications, and business processes (Majeed et al., 2022; Reddy et al., 2023). Based on signaling theory, green marketing activities serve as external signals to reduce information asymmetry between companies and consumers (Choubey et al., 2025; Sharma, 2021). When these signals are consistent, transparent, and supported by concrete evidence, consumers will form a positive perception of the brand (Tan et al., 2022). This perception is internalized into a green brand image.

H1: *Green Marketing has a positive effect on Green Brand Image.*

Green Marketing and Purchase Decisions

Green marketing can directly influence purchase decisions through increased awareness, perceived environmental value, and brand differentiation (Baca & Reshidi, 2025). In the context of Gen Z, who are highly exposed to digital campaigns, the intensity and quality of green communication become determining factors for effectiveness. However, this influence often depends on the credibility of the message (An & Ngo, 2025; Theocharis & Tsekouropoulos, 2025). Therefore, testing the direct relationship remains relevant.

H2: *Green Marketing has a positive effect on Purchase Decision.*

Green Brand Image and Purchase Decision

Brand image is a key determinant in consumer behavior theory (Jia et al., 2023). Green brand image reinforces perceived ethical value and emotional attachment (Amoako et al., 2021; García-Salirrosas & Rondon-Eusebio, 2022). Consumers tend to choose brands that align with their personal values (Michel et al., 2022; Yan et al., 2023). In the context of sustainability, value alignment is a crucial factor. When consumers perceive a brand as genuinely green, the probability of a purchase decision increases.

H3: *Green Brand Image has a positive effect on Purchase Decision.*

Mediation of Green Brand Image

Green marketing does not always result in an immediate purchase decision (Jeasuwan & Foosiri, 2025, 2025). Consumers go through a cognitive-affective process that shapes their perception of the brand before making a decision (Khatoon & Rehman, 2021; Levrini & Santos, 2021). Thus, green brand image acts as a mediator that explains the causal mechanism.

H4: *Green Brand Image mediates the effect of Green Marketing on Purchase Decision.*

Green Product Innovation as a Moderator

Green product innovation reflects a company's ability to develop products that tangibly reduce environmental impact (Ha et al., 2023; Huong et al., 2021). Based on the resource-based view, innovation is a strategic resource that creates sustainable competitive advantage (Cuthbertson & Furseth, 2022). When product innovation is high, green marketing becomes more credible and the green brand image becomes stronger (Alnasser, 2025). Additionally, product innovation strengthens the relationship between green brand image and purchase decision because consumers look not only at claims but also at tangible evidence.

H5: *Green Product Innovation moderates the effect of Green Marketing on Green Brand Image.*
H6: *Green Product Innovation moderates the effect of Green Marketing on Purchase Decision.*
H7: *Green Product Innovation moderates the effect of Green Brand Image on Purchase Decision*

METHOD

This study employs a quantitative approach to test the causal relationships among variables. The study population consists of Generation Z in Indonesia who have purchased eco-friendly products. The sampling technique employed purposive sampling with the following criteria: (1) born between 1997 and 2012, (2) having purchased an eco-friendly product within the past six months, and (3) understanding the concept of eco-friendly products. The research instrument consists of a structured questionnaire using a 1–5 Likert scale. Variable indicators were adapted from scales validated in the green marketing literature. Data analysis employed Structural Equation Modeling based on Partial Least Squares (SEM-PLS) using

SmartPLS 4. The SEM-PLS approach was selected because it can test complex models involving latent constructs, mediation, and moderation simultaneously, and is tolerant of non-normal data distributions.

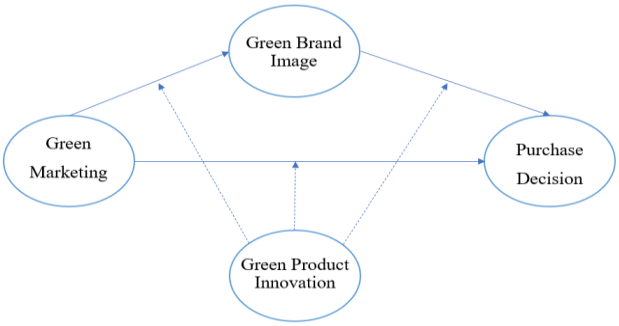


Figure 1. Research Model

RESULTS

Respondent Profile

Table 1. Respondent Profile

Respondent Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	110	34.4
	Female	210	65.6
Age	18–21 years	224	70.0
	22–25 years	84	26.3
	26–29 Years	12	3.8
Education	High School/Equivalent	86	26.9
	Bachelor's Degree (S1)	233	72.8
	Master's (S2)	1	0.3
Employment	Student	302	94.4
	Private Sector Employees	9	2.8
	Entrepreneurs	2	0.6
	Other	7	2.2
Monthly Allowance	< Rp 2,000,000	147	45.9
	IDR 2,000,000 – IDR 4,000,000	153	47.8
	> IDR 4,000,000 – IDR 6,000,000	14	4.4
	> IDR 6,000,000 – IDR 8,000,000	2	0.6
	> IDR 8,000,000 – IDR 10,000,000	2	0.6
	> IDR 10,000,000	2	0.6

Source: Processed primary data

Based on Table 1, the majority of respondents in this study were female, totaling 210 respondents (65.6%), while males numbered 110 respondents (34.4%). In terms of age, the majority of respondents were in the 18–21 age group at 70.0%, followed by the 22–25 age group at 26.3%, and the 26–29 age group at 3.8%. In terms of education, the majority of respondents held a Bachelor's degree (S1) at 72.8%, while high school graduates or equivalent accounted for 26.9% and Master's degree (S2) holders for 0.3%. Based on occupation, the majority of respondents were students (94.4%). As for monthly income, the majority of respondents earned between Rp 2,000,000 and Rp 4,000,000 (47.8%), followed by those earning less than Rp 2,000,000 (45.9%).

Validity and Reliability Test

Table 2. Validity and Reliability Test

Variable/Item	Factor Loadings	Cronbach's Alpha	Composite Reliability
Green Marketing		0.920	0.922
GM1	0.862		
GM2	0.926		
GM3	0.906		
GM4	0.899		
Green Brand Image		0.920	0.904
GBI1	0.890		
GBI2	0.905		
GBI3	0.927		
GBI4	0.773		
Green Product Innovation		0.920	0.938
GPI1	0.907		
GPI2	0.937		
GPI3	0.924		
GPI4	0.894		
Purchase Decision		0.928	0.949
PD1	0.820		
PD2	0.942		
PD3	0.931		
PD4	0.933		

Source: *Processed primary data*

Based on the results presented in Table 2, all measurement items for the research variables namely Green Marketing, Green Brand Image, Green Product Innovation, and Purchase Decision achieved factor loadings greater than 0.70. This indicates that all indicators used in this study meet the validity requirements and are considered valid for measuring their respective constructs. Furthermore, all research variables demonstrated Cronbach's Alpha and Composite Reliability values above the recommended threshold of 0.70, confirming that the measurement instruments possess strong internal consistency and reliability. Therefore, it can be concluded that all constructs in this study are both valid and reliable.

Coefficient of Determination (R-Square)

R-square is a measure most commonly used to evaluate and test the extent to which exogenous variables describe endogenous variables. This coefficient serves as a measure of a model's predictive power and is calculated as the square of the correlation between the actual value of a specific endogenous construct and its predicted value. This coefficient represents the combined effect of exogenous latent variables on endogenous latent variables. Table 3 presents the R^2 results for each variable as follows:

Table 3. R-Square Results

Variables	R-Square
Green Brand Image	0.706
Purchase Decision	0.631

Source: *Processed primary data*

The R-Square result indicates that the Green Marketing variable explains 70.6% of the variation in Green Brand Image. This value demonstrates the model's strong predictive ability in explaining the formation of green brand image among Gen Z consumers. Meanwhile, the R-Square value for Purchase Decision at 63.1% indicates that purchase decisions can be explained by a combination of the Green Marketing, Green Brand Image, and Green Product Innovation variables. The remaining 36.9% is influenced by other variables outside the research model. This finding indicates that sustainability factors play a significant role in shaping consumer purchasing behavior, particularly among the younger generation, who are increasingly concerned about environmental issues.

Hypotheses Testing

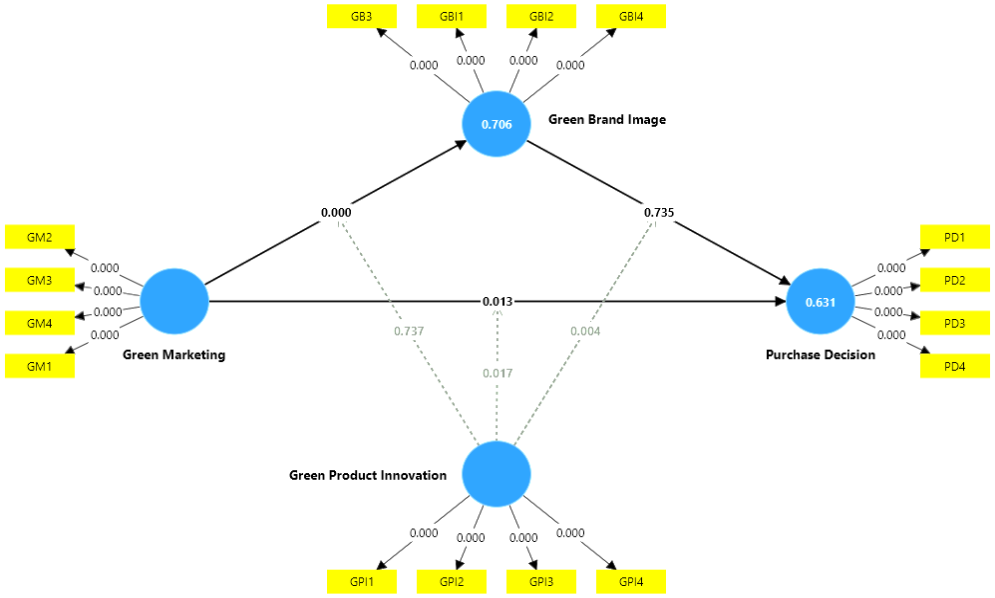


Figure 2. Model Test Output with PLS
Source: Processed primary data

Table 4. Path Coefficient Results

	Hypothesis	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistics (|O/STDEV|)	P-Values
H1	Green Marketing → Green Brand Image	0.457	0.450	0.071	6.422	0.000
H2	Green Marketing → Purchase Decision					
H3	Green Brand Image and → 's Purchase Decision	0.026	0.026	0.076	0.338	0.735
H4	Mediation Effect of Green Marketing- → - Purchase Decision.	0.012	0.012	0.035	0.337	0.736
H5	Moderating Effect of Green Product Innovation × Green Marketing- → s Green Brand Image	0.010	0.009	0.029	0.336	0.737
H6	The Moderating Effect of Green Product Innovation and Green Marketing on the Purchase Decision of a →	0.158	0.178	0.066	2.394	0.017
H7	Moderating Effect of Green Product Innovation × Green Brand Image on the → -Purchase Decision	0.205	0.222	0.070	2.911	0.004

Source: Processed primary data

Based on the results of the hypothesis testing conducted, it shows that:
The results of hypothesis 1 (H1) testing show a p-value of 0.000, indicating that Green Marketing has a significant effect on Green Brand Image. Thus, Green Marketing is proven to be effective in shaping the Green Brand Image among Gen Z. The results of Hypothesis 2 (H2) testing show a p-value of 0.735, indicating that Green Marketing does not have a significant effect on Purchase Decision. Thus, Green Marketing has not yet been able to directly drive purchase decisions among Gen Z. The results of the test for Hypothesis 3 (H3) show a p-value of 0.736, indicating that Green Brand Image does not have a significant effect on Purchase Decision. Thus, Green Brand Image has not been able to drive purchase decisions among Gen Z. The results of the hypothesis test (H4) show a p-value of 0.737, indicating that Green Brand Image does not mediate the effect of Green Marketing on Purchase Decision. Thus, Green Brand Image has not acted as a mediating variable in this relationship. The results of the hypothesis test (H5) show a p-value of 0.737, indicating that Green Product Innovation does not moderate the effect of Green Marketing on Green Brand Image. Thus, the presence of green product innovation does not strengthen this relationship. The results of hypothesis 6 (H6) show a p-value of 0.017, indicating that Green Product Innovation significantly moderates the effect of Green Marketing on Purchase Decision. Thus, Green Marketing becomes more effective in driving purchase decisions when supported by green product innovation. The results of the test of Hypothesis 7 (H7) show a p-value of 0.004, indicating that Green Product Innovation significantly moderates the effect of Green Brand Image on Purchase Decision. Thus, Green Brand Image has a greater impact on purchase decisions when reinforced by green product innovation.

Discussion

The Effect of Green Marketing on Green Brand Image

The research results indicate that Green Marketing has a significant influence on Green Brand Image among Gen Z. This finding reinforces the argument that green marketing activities can build positive consumer perceptions of a brand's environmental commitment. From the perspective of signaling theory, green marketing functions as an external signal that companies send to consumers regarding their environmental commitment (Choubey et al., 2025; Sharma, 2021). When companies consistently convey sustainability messages through promotions, packaging, or other business activities, consumers are more likely to form the perception that the brand cares about the environment. These findings also support the research by Majeed et al. (2022) and Reddy et al. (2023), which states that green marketing is a crucial instrument in strengthening green brand image. In the context of Gen Z, the effectiveness of green marketing is increasingly relevant because this group has a relatively high level of environmental awareness and is highly active in accessing digital information. Therefore, transparent and credible green marketing strategies can significantly enhance the green brand image.

The Influence of Green Marketing on Purchase Decisions

Research findings indicate that green marketing does not have a significant impact on purchase decisions. This finding suggests that green marketing activities have not yet been able to directly drive purchase decisions among Gen Z. Although consumers are exposed to green communications from companies, this is not sufficient to generate tangible purchase decisions. This finding demonstrates that Gen Z consumers do not merely consider marketing messages but also evaluate the credibility and tangible evidence of the environmental claims made by companies. This aligns with An and Ngo (2025) as well as Theocharis and Tsekouropoulos (2025), who explain that the effectiveness of green marketing heavily depends on the level of consumer trust in the green messages conveyed. Additionally, Baca and Reshidi (2025) state that while green marketing can indeed increase awareness and perceived environmental value, it does not necessarily directly influence purchase decisions. In this context, Gen Z tends to be more critical of sustainability claims and may perceive some green marketing as

greenwashing if it is not accompanied by tangible implementation. Thus, green marketing alone is insufficient to drive purchase decisions without the support of other factors such as product innovation and brand credibility.

The Influence of Green Brand Image on Purchase Decisions

The results of the study indicate that Green Brand Image does not have a significant effect on Purchase Decision. These findings suggest that consumers' perceptions of green brands have not yet been able to directly influence purchase decisions among Gen Z. In other words, a brand image perceived as environmentally friendly has not yet become a primary factor in determining consumer purchasing behavior. These findings differ from the argument put forth by Jia et al. (2023), who state that brand image is an important determinant of consumer behavior. Additionally, Amoako et al. (2021) and García-Salirrosas and Rondon-Eusebio (2022) explain that a green brand image can strengthen emotional attachment and perceived ethical value. However, in this study, Gen Z appears to consider not only the green image but also evaluates functional benefits, product quality, price, and tangible evidence of product sustainability. These results also indicate that value alignment between consumers and brands, as described by Michel et al. (2022) and Yan et al. (2023), is not yet strong enough to directly influence purchase decisions. This suggests a gap between positive perceptions of the brand and the actual purchasing behavior of consumers.

The Role of Green Brand Image as a Mediator of the Influence of Green Marketing on Purchase Decisions

The research results show that Green Brand Image is unable to mediate the influence of Green Marketing on Purchase Decisions. This finding indicates that the green marketing conducted by companies has not yet been able to form a green brand image strong enough to drive consumer purchase decisions. Theoretically, Jeasuwan and Foosiri (2025) explain that green marketing does not always result in an immediate purchase decision because consumers go through cognitive and affective evaluation processes before making a purchase. Khatoon and Rehman (2021) as well as Levrini and Santos (2021) also state that brand image should serve as a psychological mechanism bridging the influence of marketing on consumer behavior. However, the results of this study indicate that this mechanism has not yet functioned effectively among Gen Z. This suggests that while green marketing successfully enhances perceptions of a green brand, these perceptions are not yet strong enough to be converted into purchase decisions. Gen Z tends to require more concrete validation regarding a company's sustainability practices. Therefore, green brand image has not yet been able to function as an effective mediator in the relationship between green marketing and purchase decisions.

The Role of Green Product Innovation as a Moderator of the Influence of Green Marketing on Green Brand Image

The research findings indicate that Green Product Innovation is unable to moderate the influence of Green Marketing on Green Brand Image. This finding suggests that the level of green product innovation has not yet been able to strengthen the relationship between green marketing activities and the formation of a green brand image. Theoretically, Ha et al. (2023) and Huong et al. (2021) explain that green product innovation reflects a company's ability to produce more environmentally friendly products. Furthermore, the resource-based view asserts that innovation is a strategic resource capable of creating sustainable competitive advantage (Cuthbertson & Furseth, 2022). However, in this study, green product innovation did not significantly enhance the effectiveness of green marketing in shaping green brand image. This may occur because Gen Z consumers are more likely to grasp marketing communication messages than to evaluate the technical aspects of product innovation. Furthermore, the green innovations implemented by companies may not be sufficiently visible or have not been optimally

communicated to consumers. Consequently, green product innovation has not yet been able to strengthen the relationship between green marketing and green brand image.

The Role of Green Product Innovation as a Moderator of Green Marketing's Influence on Purchase Decisions

Research findings indicate that Green Product Innovation significantly moderates the influence of Green Marketing on purchase decisions. This finding suggests that green marketing is more effective in driving purchase decisions when companies possess tangible green product innovations. These results support the resource-based view, which posits that innovation is a strategic resource capable of enhancing a company's competitiveness (Cuthbertson & Furseth, 2022). Additionally, Ha et al. (2023) and Huong et al. (2021) explain that green product innovation reflects the tangible implementation of a company's environmental commitment. With product innovation, consumers not only receive the " " marketing message but also see concrete evidence of the company's sustainability claims. In the context of Gen Z, the presence of green product innovation is a critical factor because this group tends to be critical of greenwashing practices. Therefore, green marketing can only lead to purchase decisions when supported by products that genuinely possess eco-friendly characteristics. This finding underscores that marketing communication must align with the implementation of product innovation to effectively influence consumer purchase decisions.

The Role of Green Product Innovation as a Moderator of the Influence of Green Brand Image on Purchase Decisions

The research results indicate that Green Product Innovation significantly moderates the influence of Green Brand Image on Purchase Decisions. This finding suggests that a green brand image will be more effective in influencing purchase decisions when supported by tangible green product innovations. These research results support Alnasser's (2025) argument that product innovation can strengthen the credibility of a green brand image. When a company offers products with eco-friendly innovations, consumers are more likely to believe that the green image the company has built is not merely a communication strategy. From a resource-based view perspective, product innovation serves as a strategic asset that enhances a company's value and differentiation in the eyes of consumers (Cuthbertson & Furseth, 2022). For Gen Z, a green brand image alone is insufficient to drive purchase decisions (Nuryakin & Supardin, 2026) . Consumers require concrete evidence in the form of products that genuinely support sustainability principles. Therefore, green product innovation serves as a bridge between green brand image and purchase decisions. These findings indicate that the success of sustainability strategies depends not only on brand image but also on a company's ability to deliver tangible green product innovations.

CONCLUSION

This study aims to analyze the influence of Green Marketing on Green Brand Image and Purchase Decision, as well as the role of Green Product Innovation as a moderating variable among Gen Z consumers. The results show that Green Marketing has a positive and significant influence on Green Brand Image. This finding proves that green marketing activities can shape consumers' positive perceptions of brands that care about the environment. However, Green Marketing does not have a significant influence on Purchase Decision. Furthermore, Green Brand Image also does not have a significant effect on Purchase Decision. These results indicate that green marketing communication and green brand image alone are insufficient to drive Gen Z consumers to make purchasing decisions. Consumers do not merely consider sustainability messages but also evaluate tangible evidence and the actual implementation of a company's environmental commitments.

This study also found that Green Brand Image does not mediate the effect of Green Marketing on Purchase Decisions. This means that positive perceptions of green brands have not yet become an effective mechanism for driving consumer purchase decisions. Furthermore, Green Product Innovation does not moderate the relationship between Green Marketing and Green Brand Image. On the other hand, Green Product Innovation was found to moderate the effect of Green Marketing on Purchase Decisions as well as the effect of Green Brand I s on Purchase Decisions. These findings indicate that green marketing and green brand image will be more effective in enhancing purchase decisions when supported by tangible green product innovation. Thus, green product innovation is a critical factor in enhancing the credibility of a company's sustainability strategy in the eyes of Gen Z consumers.

Recommendations

Based on the research findings, companies are advised not only to focus on green marketing activities but also to strengthen the implementation of green product innovation as a tangible demonstration of their commitment to environmental sustainability. Companies need to develop eco-friendly products with clearly defined sustainable characteristics, such as the use of recycled materials, waste reduction, eco-friendly packaging, and energy efficiency in production processes. Additionally, companies need to enhance the transparency and credibility of sustainability-related information to reduce consumer skepticism regarding greenwashing practices. This can be achieved through environmental certifications, eco-labels, sustainability reports, or more open communication regarding the environmental impact of the products offered. For marketing practitioners, green marketing strategies should not only focus on promotional messages but also emphasize tangible evidence of the company's green product innovations. Integrating marketing communication with product innovation will enhance the effectiveness of marketing strategies in influencing Gen Z consumers' purchasing decisions. For future researchers, this study could be expanded by incorporating additional variables that may influence Purchase Decision, such as green trust, perceived value, environmental concern, willingness to pay, or consumer skepticism. Future research is also recommended to expand the scope to different industrial sectors or involve other generational groups to achieve broader generalizations regarding sustainable consumer behavior.

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