



Exploring Green Energy Adoption: A Comprehensive Study on India's Sustainable Future Trends using Stimulus-Organism-Response Model

Udit Chawla^{1,2}, Tanpat Kraiwanit³, Rajesh Mohnot^{4*}, Reyaansh Dugad⁵

¹Rangsit University, Pathum Thani, Thailand, ²Department of Business Administration, Institute of Engineering and Management, School of University of Engineering and Management, Kolkata, West Bengal, India, ³Faculty of Economics, Rangsit University, Pathum Thani, Thailand, ⁴College of Business Administration, Ajman University, UAE, ⁵Dubai Scholars, UAE. *Email: r.mohnot@ajman.ac.ae

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ABSTRACT

This artifact examines the inhibitors and organizers of green energy technology in India, with an emphasis on consumers' viewpoints on the transfer to renewable energy. The study aims to regulate the impression and connection of perceived trust, attitude, perceived usefulness, perceived environmental concern, and behavioural intention on consumers' purchases of green energy. The study settles that poise in green energy suppliers, a favourable attitude toward environmental conservation, and apparent advantages such as prices and consequences are significant drivers of green energy. Moreover, the study emphasizes the prominence of demonstrative appeals and environmental signs in shaping sustainable consumption habits. These findings also provide useful recommendations for directors focused on green energy, such as building trust, accentuating the reimbursements of using clean technologies, and confirming the compatibility of marketing posts with consumer values, all of which are critical for the region's broader approval of renewable energy.

Keywords: Perceived Trust, Perceived Attitude, Perceived Usefulness, Perceived Concern, Intention to use, Green Energy Adoption

JEL Classifications: M30, M31

1. INTRODUCTION

Green energy, attained from renewable causes such as the sun, wind, water, biomass, and geothermal heat, offers a persuasive value intention to both the industrial and residential sectors (Ghorbani et al., 2023). Green technology development has indignant the curiosity of both the corporate and public divisions around the world as environmental concerns deteriorate (Kiatcharoenpol and Sirisawat, 2020). Research (García-Lillo et al., 2023; Gu and Wang, 2022) specifies that a green entrepreneurship orientation (GreenEO) is decisive for promoting sustainable entrepreneurship and flexibility in the manufacturing business. Green EO provides numerous potential aids to organizations, including nurturing the discovery of

new ideas, grasping potential opportunities, and reassuring innovativeness and risk-taking, all of which subsidize the transformation of the social economy into a socioecological economy (Guo et al., 2020). Solar energy is a renewable, clean energy cause that distances the universe (Jirakiattikul et al., 2021). Green and robust approaches provide more chances for businesses to respond to stakeholder pressures while also refining organizational presentation and the environment (Shashi et al., 2020). Organizations arrange sustainability and flexibility for survival, important to an intensification in green entrepreneurship (Ren et al., 2022). In fact, city governments' promotion of "climate friendliness" is often used as a justification to pursue "green growth coalitions" that accentuate capital reproduction overhead social reproduction (Rice et al., 2020).

Energy is observed as a decisive component of both human sustainability and economic development (Zhe et al., 2021). A chronicle often converses why technology is required, why this technology is favoured over substitute possibilities, and how this technical solution fits into a greater solution, in this sample as part of a contested energy mix (Boutilier, 2020). Unlike other energy-producing technologies such as wind turbines, scarce studies have meticulously examined the receipt of large-scale solar farms (Cousse, 2021). In contrast, believing that an energy project will deliver advantages is certainly connected to receipt (De Groot et al., 2020). One difficult component of this energy shift is the operation of solar and photovoltaics to generate power (Victoria et al., 2021). Zargar et al. (2024) also revealed a significant energy transition from fossil fuels to renewable energy. Another study examined the long-run effect of carbon emission in the context of some European countries (Sisodia, et al, 2023).

Employee involvement in environmental programs is critical for assisting employees in attaining tacit environmental knowledge (Chaudhary, 2020). Fossil fuels like oil, coal, and natural gas account for about 80% of global energy construction. This heavy consumption is a major issue for the world budget and the environment (Hojnik et al., 2021). The most important factor is all-around employee administration - green human resource management (GHRM), which is definite as a set of human resource management (HRM) practices central to nurturing employee green behaviours (Ababneh et al., 2021; Muisyo et al., 2022) and evolving employees' abilities, commitment, and engrossment in the sustenance of the organization's green areas (Mugoni et al., 2023).

Financial reoccurrence is the single most important forecaster of solar adoption in the commercial segment (Crago and Koegler, 2018); and financial enticements and knowledge are well-established elements of adoption purposes among individual households (Alipour et al., 2020). When studies discover demographic predictors of solar adoption, they usually put effort on economic drivers other than income (Lin and Kaewkhunok, 2021; Wolske, 2020). Trust in suburban homeowners' adoption of solar PV has been allied to the occurrence of trustworthy communication channels and important sources (Sommerfeldt et al., 2022). Environmental corporate social responsibility progresses a company's image, reputation, and diagnoses for development (Javed et al., 2020; Liu et al., 2021) by preserving energy, preventing pollution, and constructing in a greener manner (Abu Zayyad et al., 2021). And this further suggests a possibility of a relationship between energy markets and investments (Verma and Mohnot, 2023) as well the capitalization and capital structure of specific industries (Mohnot, 2000). The research question for the study is given below: -

RQ1: To analyze the key influences on consumer adoption of green energy in India, focusing on behavior and decision-making patterns.

2. LITERATURE REVIEW

2.1. Stimuli

2.1.1. Perceived trust

Trust can be viewed as the amount of confidence that people surrender to another party to perform in a certain way or even in

their best or preferred interest (Horne et al., 2021). Customers who respond to green advertising are expected to have conviction in the company's sustainability objectives. Green Trust (GT) is also pivotal in shaping behavioural intentions; a higher level of trust in a company's green initiatives correlates with increased participation in eco-friendly behaviours (Ahmad et al., 2023). Trust in a business's eco-friendly policies refers to consumers' dependence on the firm, based on their views about the company's goodwill, reputation, and dedication to environmentally friendly methods (Hang et al., 2022). This is especially true for long-life products (Lüdeke-Freund et al., 2019) and business models advocating for sufficiency through upgrading, repairing, disassembling, durability reusing, servicing, and warranty (Mostaghel et al., 2021).

Emphasizing green advertising and green brand image is a necessity for the sake of developing consumers' trust and loyalty. (Lavuri et al., 2022). Furthermore, the work by Lavuri et al. (2022) confirms that brand trust has a positive effect on stimulus factors and purchase intentions. Likewise, if there are unclear and purposefully false data about the product before the purchase is made, consumers are deprived (Hankammer et al., 2019). Furthermore, this puts more doubt into those claims if the company team with organizations that may not be famous or not so credible.

H_1 : Perceived trust has a positive effect on consumer intention to use green energy

H_6 : Intention to use mediates between perceived trust and green energy adoption

2.1.2. Perceived attitude

A green attitude involves a personal commitment to protecting the environment and making choices that positively impact on the planet (Mittal et al., 2024). The public can have a positive attitude towards a large number of concepts. Some of the components that enhance customers helping other customers in a green context include Attitudes toward the use of a service (Hwang and Lyu, 2020). Previous studies have also found that internal values, green attitudes, and perceived subjective norms could also have a positive relationship with green customer citizenship behaviour like assisting other customers in making the right green purchase decisions (Van Tonder et al., 2023).

Concerning the customer purchasing idea, a few studies including Panda et al. (2020) depicted that customer attitude towards green products will lead to their behaviour and have a vital role to play in framing green buying intention of customers for green services and products. Furthermore, the consumers' attitude toward the environment captures the extent to which they are concerned about the environment or the degree to which they are indifferent about the environment (Ahmad and Zhang 2020).

H_2 : Perceived attitude has a positive effect on consumer intention to use green energy

H_7 : Intention to use mediates between perceived attitude and green energy adoption

2.1.3. Perceived usefulness

Perceived usefulness occupies a central position as regards influencing the intention to use new technologies such as green energy solutions and technological innovations that may come

to support the concept of sustainability (Zou et al., 2017). When applied to the consumption of green energy sources in South Asian countries, perceived usefulness is the extent to which people are convinced that green energy will improve their quality of life, lead to cost savings, and be environmentally friendly driven by cost cuts.

Furthermore, related breakthroughs like energy storage, smart grids, and demand response are important to making green energy more inexpensive and broadly adopted (Bogdanov et al., 2021). In addition, ICT can supplement energy conservation initiatives by optimizing energy use within buildings. As a result, ICT is predicted to further reduce the intensity of energy use among both business and residential end users (Pasichnyi et al., 2019). In summary, if individuals or businesses believe that adopting green energy will lead to reduced costs, enhanced energy efficiency, or environmental benefits, they are likely to accept these technologies.

H₃: Perceived usefulness has a positive effect on consumer intention to use green energy

H₈: Intention to use mediates between perceived usefulness and green energy adoption

2.1.4. Perceived concern

Environmental concerns are recognized as a key factor in predicting sustainable consumption intentions. Individuals who are more environmentally conscious are often more likely to adopt sustainable behaviors (Sharif et al., 2023). However, the underlying mechanisms of this relationship remain unclear. Anticipated emotions may play a pivotal role in shaping consumer decisions, as the emotional impact of making sustainable choices can significantly influence and motivate those decisions.

Development in energy technology and appliance of green energy are linked with many processes including urbanization, economic development globalization, tourism, industrial changes, and sustainable development. Though, emissions of carbon or greenhouse gases in various types of energy consumption are a major issue because they play a vital role in global warming and impact environmental quality (Shahzad et al., 2023; Mehmood et al., 2021).

H₄: Perceived concern has a positive effect on consumer intention to use green energy

H₉: Intention to use mediates between perceived attitude and green energy adoption

2.2. Organism

2.2.1. Intention to use

Green purchase intention indicates customers' willingness to acquire and pay for environmentally friendly products, suggesting a preference for pro-environmental products over non-environmental ones throughout the purchasing process (Han et al., 2022). Green purchase intention may lead to green behavior because customers appreciate the environmental importance of purchasing eco-friendly items (Vu et al., 2022). Consumers' wants and expectations may shift, making them prepared to pay a premium for environmentally friendly items. Environmental values that promote environmentalism have a favorable impact on customers to use green energy (Wang et al., 2021b).

Performance Expectancy is the essential variable in adopting innovative energy technologies by individuals (Gimpel et al., 2020). Lau et al., (2021) revealed that performance expectations on solar photovoltaics are related to consumers' behavioral intentions. According to Jaafar et al., (2020), performance expectancy has a positive and significant impact on attitude. Consumers with better product knowledge are more adept at making purchasing decisions and choosing the option that best fits their purchase criteria than those with less product knowledge (Malik et al., 2020).

H₅: Customer's intention to use has a positive effect in adopting green energy

2.3. Response

2.3.1. Green energy adoption

Diverse attitudes have taken center stage—including everything from challenges of environmental sustainability and energy efficiency to the potential financial benefits of integrating new technologies—all centered around the critical factor of implementing new technologies (Zhang et al., 2022). Analysis has also highlighted a strong relationship between sentiments and buying intention from the perspective of environmental awareness (Ahmad et al., 2022). Moreover, to simply state the impulses for integrating new technologies, the analysis indicates that these impulses are intrinsically linked to behavioral traits, like self-appraisal and Individual assessment (Ashfaq et al. 2021).

Attitudes may be categorized as either positive or negative, and they are tied to the repercussions of certain tasks, such as the acceptance of technical breakthroughs. It is widely recognized that attitudes significantly influence the acceptance of sustainable energy sources, illustrating their applicability to the previously mentioned ideas. An optimistic outlook of a particular service nurtures consumers' propensity to initiate and accept it (Lobo and Greenland 2017).

3. RESEARCH METHODOLOGY

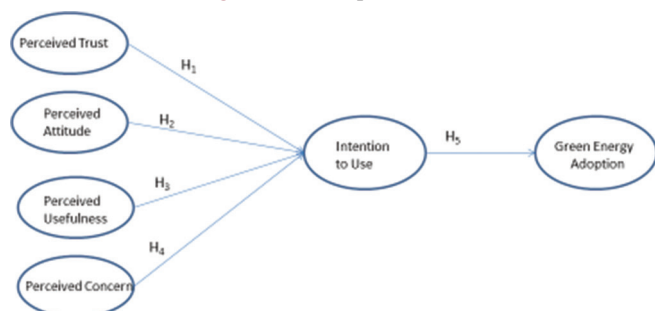
The study was done using the Stimuli-Organism-Response model. It offers a methodical approach to understanding the complexities of human behavior (Mehrabian and Russell, 1974). The paradigm posits that an individual's internal or organismic state (organism) is linked to environmental cues (stimuli) on one side and behavioural outcomes similar to approach or avoidance (response) on the other. According to the theory, stimuli (S) influence a person's internal emotional states (O), resulting in either approach-oriented or avoidance-oriented responses (R) (Floh and Madlberger, 2013). The population consists of respondents from Hameera in district Jaisalmer, Rajasthan, Khinvasar in district Nagaur, Rajasthan, Kolar district, Karnataka, Chitradurga district, Karnataka, Bharuch district, Gujarat, Rajkot District, Gujarat. The study focused on the three states of India which are Rajasthan, Karnataka, and Gujarat. These states were chosen because they are the leading green energy-producing states. Leveraging data collection strategies to improve consumer adoption and understanding of green energy, while providing an electronic platform, such as Google Form, for customers to easily address questions, can significantly streamline

the process and improve engagement. Purposive sampling was used in this analysis choosing those customers who already have adopted Green energy. The ultimate questionnaire consisted of 19 items and a five-point Likert scale was used as it is a standard procedure. Through this research work, due to several constraint factors, we have distributed the questionnaire in Google Forms to 267 consumers who already adopted green energy, among which 249 forms were taken as validated response. Using SPSS and AMOS version 26.0, we have analyzed the data. Respondents are of the age group 18-25 years-30%, 26-30 years-25%, 31-35 years-31%, >40 year-14%, of which 62% are Male and 38% Female respondents. Figure 1 (Conceptual Model) was developed by the Authors as shown below.

4. FINDING AND ANALYSIS

From the study, the Kaiser-Meyer-Olkin value is 0.845, and the approximate Chi-Square is 3251.142, Bartlett's Test of Sphericity, Sig - 0.000. This test provides the minimum requirement that must be met to perform a factor analysis.

Figure 1: Conceptual model



From Total Variance Explained Table 1, Factor 1 (Perceived Trust) accounts for a variance of 10.001 which is 47.387% of the total variance, likewise, Factor 2 (Perceived Attitude) accounts for a variance of 1.973 which is 8.666% of the total variance, Factor 3 (Perceived Usefulness) accounts for a variance of 1.421 which is 7.080% of the total variance, Factor 4 (Perceived Concern) accounts for a variance of 1.322 which is 4.001%, Factor 5 (Intention to use) accounts for a variance of 1.009 which is 3.552% of the total variance and thus, the first five factors combined account for 70.686%. Table 2 discusses the estimates of different factors.

H_0 : $B_1 = 0$ The null hypothesis implies that there is no linear relationship between Intention to use and factors, "Perceived Trust," "Perceived Attitude" "Perceived Usefulness," and "Perceived Concern."

H_1 : $B_1 \neq 0$ The Alternative hypothesis implies that there is a linear relationship, between Intention to use and factors, "Perceived Trust," "Perceived Attitude," "Perceived Usefulness," and "Perceived Concern."

In the above Table 3, R-square value is 0.646 which indicates 64.6% of the total variation in the dependent variable Green Energy Adoption.

From ANOVA Table 4, the model is significant at 0.05.

Table 5 discusses the Coefficients. The equation is given below:

$$\text{Intention to use} = 3.605 + 0.345 * (\text{Perceived Trust}) + 0.301 * (\text{Perceived Attitude}) + 0.320 * (\text{Perceived Usefulness}) + 0.244 * (\text{Perceived Concern})$$

Table 6 discusses the fit indices parameters as presented below.

Table 1: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.001	47.387	47.387	10.001	47.387	47.387
2	1.973	8.666	56.053	1.973	8.666	56.053
3	1.421	7.08	63.133	1.421	7.08	63.133
4	1.322	4.001	67.134	1.322	4.001	67.134
5	1.009	3.552	70.686	1.009	3.552	70.686
6	0.846	3.48	74.166			
7	0.704	2.75	76.916			
8	0.682	2.64	79.556			
9	0.566	2.611	82.167			
10	0.5	2.292	84.459			
11	0.44	2.001	86.46			
12	0.38	1.77	88.23			
13	0.364	1.691	89.921			
14	0.33	1.5	91.421			
15	0.3	1.37	92.791			
16	0.271	1.252	94.043			
17	0.25	1.201	95.244			
18	0.227	1.071	96.315			
19	0.201	1.061	97.376			
20	0.168	0.991	98.367			
21	0.149	0.989	99.356			
22	0.102	0.644	100			

Table 2: Rotated component matrix

Variables	Perceived Trust	Perceived Attitude	Perceived Usefulness	Perceived Concern	Intention to use
I trust that green energy sources (solar, wind, etc.) are reliable for daily usage.	0.879				
I rely on the firms that offer green energy have good ethical necessities.	0.869				
Green energy resolutions are open and honest about their benefits and hitches.	0.855				
I trust the government ropes trustworthy policies about green energy practice	0.801				
Personally, I am in favour of consuming green energy instead of outdated sources.		0.825			
I feel that retaining green energy is an operative strategy to avoid climate change.		0.799			
Green energy adoption is an inclination that I support because of the enduring benefits.		0.789			
I have a optimistic view of entities and businesses that practice green energy.		0.769			
Implementing green energy will result in lower enduring energy expenses.			0.832		
The practice of green energy improves the overall eminence of life.			0.829		
I believe that green energy is more resourceful than fossil fuels.			0.797		
Green energy implementation will help to create a constant and ecological economy.			0.765		
I am concerned about the reliability of renewable energy under hostile weather circumstances.				0.866	
I feel that green energy infrastructure development is lagging behind.				0.859	
I am concerned about the well-being and environmental impact of green energy technology.				0.754	
I want to practice green energy resolutions (such as solar panels) in the future.					0.798
I do want to study more about how I can move to employing green energy.					0.779
I am willing to pay a greater value for energy if it is extracted from green sources.					0.776

Table 3: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.804	0.646	0.661	0.796

Table 4: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	309.912	5	61.982	95.064	0
	Residual	152.628	244	0.625		
	Total	462.54	249			

Table 7 provides the Composite Reliability (CR), and Average Variance Extracted (AVE) for each of the factors, along with the correlation coefficients between the factors.

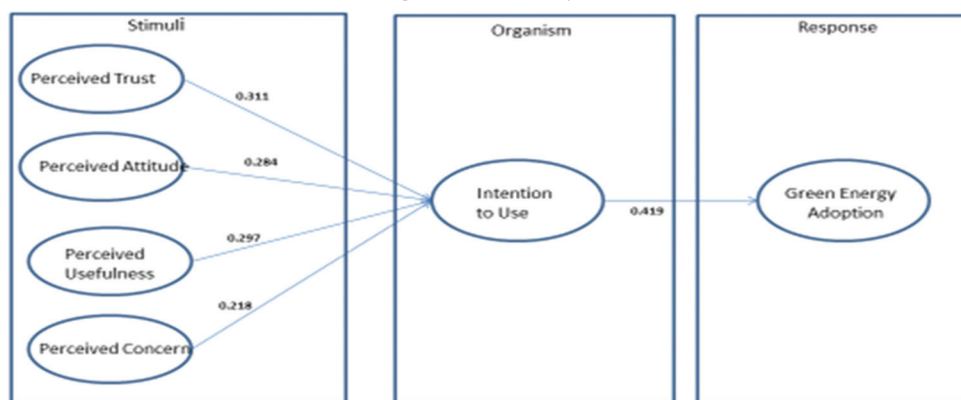
The results (Table 8) revealed significant relationships between the identified factors and the green energy adoption. Perceived Attitude has a substantial positive effect on the adoption of green energy ($\beta = 0.311$, $P < 0.01$), indicating that the attitude plays an

important role in shaping and influencing the adoption of green energy practices. Perceived Trust also showed an important effect on the green energy adoption ($\beta = 0.284$, $P < 0.01$), emphasizing the relationship between trust and green adoption. The other factors too had impacts on the green energy adoption, being comparatively less but it's significant at $P < 0.01$. These relationships are illustrated in Figure 2.

Table 9 discusses Tests for Mediation which establishes the relationships between the constructs.

4.1. Theoretical Implications

The study highlights a number of significant theoretical issues, the most significant of which is the joint use of institutional theory and the push-pull-mooring framework to comprehend the simultaneous impacts of institutional and personal variables on passengers' decisions to utilise public transit (Anwar, 2023). The study's conclusions have important theoretical ramifications for comprehending South Asian consumers' attitudes towards the adoption of green energy. The results emphasise the necessity of taking a strategic approach to understanding how normative,

Figure 2: Path analysis**Table 5: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.605	0.051		70.686	0
Perceived Trust	0.345	0.051	0.321	6.764	0
Perceived Attitude	0.301	0.051	0.289	5.902	0
Perceived Usefulness	0.32	0.051	0.301	6.275	0
Perceived Concern	0.244	0.051	0.222	4.784	0

Table 6: Fit indices

Measure	Observed	Threshold
Chi-square (CMIN)	21.987	
DF	9	
GFI	0.97	>0.90
NFI	0.95	>0.90
CFI	0.96	>0.90
RMSEA	0.055	<0.08
PCLOSE	0.143	>0.05
SRMR	0.036	<0.06

regulatory, and context-specific personal characteristics may encourage people to use public facilities during disruptive events and emergencies that restrict their mobility and increase fears about death (Marco-Lajara e al., 2023). New studies provide information on leanings in solar energy adoption decisions, including motivators, demographics, and legislation. The results imply that customers' decisions to switch to green energy are impacted by psychological and ecological variables in addition to logical ones like cost and utility.

Enthusiasm is one of the most crucial factors influencing the acceptance of solar energy (Yang and Jiang, 2023). According to Legault et al., (2024), professed autonomy, relatedness, and caregiving reasons are other sorts of motivation that impact whether or not people use solar energy. Additionally, the focus on trust-building techniques in green energy suppliers emphasises the necessity of incorporating them into theoretical frameworks on customer uptake (Castro-Lopez, 2023). Government regulations and policies can also play important role in establishing trust among investors to boost the emerging renewable energy market by offering the subsidies to mitigate the investors' risk (Sisodia et al., 2023). The results imply that customers' decisions to switch to green energy are impacted by emotional and environmental

elements in addition to logical ones like cost and utility. This study contributes to the conversation on how environmental cues and emotional appeals influence sustainable consumption patterns by arguing that these elements need to be included in future models.

4.2. Managerial Implication

For South Asian policymakers and marketers of green energy, the study has important management ramifications. The conceptual framework and empirical explanations for green energy in the current study presents the following theoretical propositions, which have important managerial implications particularly for firms planning on venturing into the green market. Managers must realize that trust is a major intangible which influences people's decision to accept or follow the strategies developed by the businesses. Sustainability is a trust factor and offering credible information before the purchase may increase the acceptability of the clients. Green trust is important in creating the customer preferences on environmentally friendly products. Once consumers are convinced by the brand's image in a green perspective, they are likely to repurchase the same brand.

People's concern towards environmental issues influences the level of sustainable consumption. Managers should capitalize on these worries by making green energy solutions as important weapons against climate change and high carbon footprints. Green purchase intention clearly impacts the untapped market share which is necessary when improving the sector in the green energy business. The managers should ensure that they come up with a great value proposition that appeals to the consumer's environmental conscience while highlighting the benefits of using green energy products in an organization. This is through having useful prices and product guarantees, satisfying the consumer during the buying experience.

Table 7: Data validity and reliability analysis

CONSTRUCTS	CR	AVE	Perceived Trust	Perceived Attitude	Perceived Usefulness	Perceived Concern	Intention to Use
Perceived Trust	0.958	0.852	0.923				
Perceived Attitude	0.939	0.796	0.378	0.892			
Perceived Usefulness	0.943	0.806	0.249	0.246	0.898		
Perceived Concern	0.935	0.829	0.154	0.205	0.212	0.910	
Intention to Use	0.916	0.784	0.101	0.185	0.123	0.108	0.885

Table 8: Path analysis

Path	Estimate	SE	Support
Intention To Use <- Perceived Trust	0.311*	0.069	H ₁ , Yes
Intention To Use <- Perceived Attitude	0.284*	0.099	H ₂ , Yes
Intention To Use <- Perceived Usefulness	0.297*	0.048	H ₃ , Yes
Intention To Use <- Perceived Concern	0.218*	0.053	H ₄ , Yes
Green Energy Adoption <- Intention To Use	0.419*	0.038	H ₅ , Yes

*Statistically significant at 0.01 level

Table 9: Test for mediation

Relationship	Direct Effect	Indirect Effect	Results	Hypothesis
Perceived Trust --> Intention to Use	0.311*	0.209	Partial Mediation	H ₆ partially mediates
--> Green Energy Adoption				
Perceived Attitude --> Intention to Use	0.284*	0.166	Partial Mediation	H ₇ partially mediates
--> Green Energy Adoption				
Perceived Usefulness --> Intention to Use	0.297*	0.184	Partial Mediation	H ₈ partially mediates
--> Green Energy Adoption				
Perceived Concern --> Intention to Use	0.211*	0.099	Partial Mediation	H ₉ partially mediates
--> Green Energy Adoption				

*Statistically significant at 0.01 level

5. CONCLUSION

As South Asian countries' transition to green energy technologies represents an important step towards long-term growth and economic transformation, this study shows that many factors influence adoption, including perceived trust, attitude, usefulness, environmental awareness and intention to use. Consumer trust in green energy providers and technologies is particularly important as it influences customers' willingness to invest in renewable energy sources. This is reinforced by a positive attitude towards green activities in terms of internal values and social standards, increasing the likelihood of using sustainable energy technologies.

Managers must also make sure that customers view green energy options as practical and simple to incorporate into their everyday life. These findings provide valuable management insights for green energy organizations. To increase trust, companies can create communication channels and collaborate with reputable environmental organizations. According to marketing techniques, the benefits of green energy need to be promoted intellectually and emotionally to customers. Moreover, integrating green energy products into cultural and legal frameworks will increase their use and acceptance. Green energy providers may enhance their market positioning and facilitate the area's shift towards renewable energy by taking measures to mitigate these issues.

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