

The Impact Of Transformational Leadership On Energy Innovation: A Review From The Viewpoint Of The Consumer

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ABSTRACT

In the contemporary era, the topic of energy innovation is gaining significant importance. Consumers, as end-users of energy, play a crucial role in propelling advancements in this field. This study investigates the impact of transformational leadership on energy innovation from the perspective of consumers. The primary objective is to ascertain how transformational leadership influences energy innovation as perceived by consumers. Employing a descriptive qualitative methodology, this research focuses on five consumers representing the general public of energy users. Data were collected through literature reviews, interviews, and observations conducted over a two-month period from March to April 2024. The findings indicate that consumers highly value energy innovation, particularly regarding its efficiency, sustainability, and environmental impact. These insights reveal that sustainability not only shapes product perceptions but also drives purchasing decisions and enhances consumer loyalty. Sustainability has become a pivotal factor in consumer buying choices, influencing their perception of value and satisfaction with products. Furthermore, by integrating technological innovation with ethical practices and transparent, effective sustainability policies, companies can secure long-term trust and support from their customers. This research provides critical insights into the intersection of transformational leadership and energy innovation from a consumer standpoint. It offers valuable implications for governments and corporations in formulating strategies that promote sustainable energy innovation. Ultimately, this study aims to contribute to the advancement of energy innovation by encouraging leadership practices that align with consumer expectations for sustainability, ethical business operations, and transparency.

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1. Introduction

Energy plays a crucial role in supporting economic activities and as a natural resource, its management should be based on sustainable development principles. Despite Indonesia's significant potential in renewable energy, its utilization remains suboptimal. Renewable energy consumption in

Indonesia from 1990 to 2018 remained low and was dominated by fossil fuels, with a non-significant increase in consumption [1]. Energy, as an interdisciplinary concept, is not only related to science and the environment but also to global social issues. In energy development, conservation is a vital aspect involving efficient and rational energy use without compromising its performance. A profound understanding of energy enables individuals to make wise decisions and act responsibly in energy consumption [2]. With the increasing demand for energy driven by population growth and global economic modernization, investigating the drivers of energy consumption becomes crucial to coordinate the relationship between energy and economic growth [3].

In Indonesia, economic growth shows a stable trend, while energy consumption growth exhibits a declining trend. Factors such as oil, gas, and biomass consumption, as well as education levels, have a positive and significant impact on the economy, while road infrastructure and life expectancy do not show significant influence [4]. In today's evolving information technology era, the need for electricity and energy conservation becomes increasingly significant. A detailed understanding of energy usage can assist in determining usage costs and identifying the largest potential users, ultimately supporting recommendations for operational equipment and processes [5]

Conventional energy sources such as coal, gas, and oil indeed support economic growth, but their adverse environmental impacts drive a shift towards renewable energy sources. The use of renewable energy, considered environmentally friendly with low emissions, will be crucial in future electricity generation [6]. The growth in electricity usage in Indonesia necessitates electricity production that can meet these demands. Solar Power Plants (PLTS) are one environmentally friendly solution, but the transition from conventional electricity supply services to PLTS is not fully embraced by Indonesian society due to a lack of understanding of its differences and benefits [7]

Investments in energy have shown a positive impact on economic growth, while school enrollment rates demonstrate a long-term negative influence. In the short term, electricity consumption does not show a significant impact on Indonesia's economic performance, but investments have a positive and significant effect [8]. In addition to the importance of energy in economic, social, and environmental contexts, and the role of renewable energy, efforts to reduce energy waste are worthy of attention. [9] states that after energy waste sources have been identified through an energy audit, techniques are needed to reduce this waste. The process of identifying and reducing this waste is crucial in transitioning to more environmentally friendly energy configurations. In a broader context, [10] emphasize that this transition requires deep, transformative, and systemic changes. The current level of socio-political discourse, which tends to be rigid towards classical understandings of citizenship roles and normative participation, needs to be broken to allow a broader understanding of social responsibility and active participation in energy management.

According to [11] Waste Electrical and Electronic Equipment (WEEE) has been in the spotlight in the last three decades due to its hazardous characteristics and potential for resource recovery, such as precious metals, ferrous and non-ferrous metals, and plastics. This issue underscores the importance of adopting more efficient and environmentally friendly technologies and processes in the use and recycling of electronic equipment. Meanwhile, [12] emphasizes the importance of actively involving consumers in the future energy system. She suggests that consumers can become more active by taking advantage of various Innovative Energy Services (IES) designed for homes and individual customers. This includes a range of services that support more efficient energy use and empower consumers to participate directly in energy management.

The integration of these approaches forms a strong foundation for a better understanding of how sustainable energy management can be achieved and demonstrates how consumers can actively participate in this process, which is a crucial step towards a more sustainable energy transition. Leadership in energy innovation has become a significant subject in modern management studies. Transformational leadership theory, which highlights emotional aspects, beliefs, and values, plays a central role in understanding how leaders influence innovation in companies. In an era where the speed of energy technology change is crucial, transformational leaders are expected to provide significant impetus through intellectual stimulation, openness to new ideas, and inspiration and motivation for innovative behavior among employees.

[13] emphasize the importance of a transformational leader's positive influence on the company, including encouraging open-mindedness and motivating employees to innovate. [14] state that

transformational leadership has a positive impact on employees' innovative behavior, directly linked to motivation for learning. This indicates that transformational leadership is not just about giving directions but also igniting innovation and learning spirit in the workplace.

[15] highlight the importance of the relationship between transformational leadership, intrinsic motivation, and good work performance. Although there is a significant relationship between transformational leadership and job performance, this research also shows that other factors such as work fatigue and social loafing can moderate this relationship. This emphasizes the importance of leaders not only inspiring employees to achieve desired outcomes but also understanding the psychological dynamics that affect their performance.

However, in a deeper understanding context of the influence of transformational leadership, there is a new development in research that focuses more on the individual characteristics of employees. Research by [16] highlights the role of self-determined motivation by employees as the main mediation between transformational leadership and high work engagement. By understanding the intrinsic and autonomous motivation of employees, transformational leaders can be more effective in influencing sustainable work engagement.

Effective leadership in industries, especially in the energy sector, transformational leadership has been proven as a successful management tool [17]. [18] state that leadership style is a key factor influencing organizational and employee job performance improvement, as well as determining goals to pursue, which not only benefits employees but also contributes socially and economically to society. In a more dynamic and complex context, it is important to understand that leadership styles influence employee performance and loyalty, and that organizational climate can mediate the influence of leadership styles on employee performance and loyalty [19]

[20] illustrate that leadership from the perspective of Ki Hajar Dewantara emphasizes the importance of behaving and speaking well, being an example, and encouraging subordinates to excel through three main principles: Ing Ngarso Sung Tuladha, Ing Madya Mangun Karsa, and Tut Wuri Handayani. These principles underline the importance of inspirational, supportive, and empowering leadership. The rapid changes in the environment, including the impact of the COVID-19 pandemic, have driven leaders to transform and adapt, leveraging new communication technologies and adopting new paradigms in society. In the era of the 4.0 industrial revolution, it is crucial for leaders to develop ethical, transformational, and digital leadership styles, enabling effective implementation in a changing organizational environment [21].

[22] observe that global leaders in the energy sector have enhanced their environmental governance practices by incorporating more women in management teams. This has improved carbon disclosure performance, highlighting the importance of women's roles in leadership to achieve net-zero carbon emissions goals. [23] emphasize the importance of women in leadership to promote carbon disclosure transparency and support the United Nations Sustainable Development Goals, which include gender equality, reducing inequalities, and climate action. Poor leadership can affect planning, implementation, and control, negatively impacting project delivery. This is highly relevant in sustainable renovation projects, where new sustainable technologies are introduced to reduce energy demand in existing buildings [24].

Previous studies have been conducted such as [25] showing that transactional and transformational leadership have a significant positive relationship with job satisfaction, commitment, and hygienic practices among food handlers. Job satisfaction and commitment act as partial mediators in enhancing hygienic practices through the influence of transactional leadership. [26] indicate that organizational culture directly influences performance and also partially mediates the influence of transformational leadership on organizational performance.

[27] identify varying causal relationships between economic growth and CO₂ emissions as well as energy consumption in several Southeast Asian countries, demonstrating bilateral and unilateral influences in these relationships. [22] note an increase in the number of women in global energy leadership boards is associated with increased carbon disclosure, highlighting the critical role of women in leadership for sustainable practices and more sustainable economic growth.

A study by [28] on Fintech adoption and transformational leadership has a direct and significant impact on SMEs' sustainable performance, with circular economy practices and competitiveness as important mediators. [29] highlight that personal pro-environmental characteristics and

environmentally friendly social atmospheres complement each other in promoting energy-saving behaviors, with environmental values and social norms as crucial factors.

[30] state that population growth and coal consumption in Indonesia significantly contribute to increased greenhouse gas emissions, with population growth as the dominant factor. [1] found that economic and population growth do not significantly affect renewable energy consumption in Indonesia, but energy subsidies have a significant negative impact, while fossil fuel energy consumption has a positive and significant influence.

A review by [31] on lean manufacturing partially mediates the relationship between transformational leadership and sustainability performance in automotive and non-automotive industries. [32] suggest a Granger causality from energy consumption to financial development significantly impacts CO₂ emissions. Financial development must be driven to support sustainable development, with emphasis on optimizing energy structure and efficiency. Additionally, [33] and [34] explore the relationship between energy consumption, economic growth, and CO₂ emissions, with important implications for energy and environmental policies that recognize sectoral differences.

Overall, these findings illustrate the importance of leadership, both in organizational contexts and in emission reduction efforts and energy management, demonstrating the complexity and interplay of economic, environmental, and leadership factors in achieving sustainable goals.

The author identified several gaps, including: First, previous research tended to focus on the impact of transformational leadership on internal organizational performance without investigating how this leadership style influences consumer perceptions and behaviors towards energy innovation. Second, the literature lacks exploration on how transformational leadership can facilitate the adoption of new energy technologies by consumers, especially in the context of sustainability. Third, studies integrating transformational leadership analysis with socio-economic factors influencing consumer behavior are still limited, thus the understanding of how these factors interact remains restricted. Lastly, research largely overlooks the long-term impact assessment of transformational leadership on energy innovation adoption.

By addressing these gaps, this research has the potential to make a significant contribution to the literature and guide future efforts in implementing and promoting consumer-focused energy innovations. The implications of this study are quite significant. For policy sectors, the findings can support the development of strategies that strengthen the role of leadership in promoting and marketing energy innovations. Organizations can leverage these insights to develop leadership strategies that are more responsive to consumer needs and expectations, which in turn can accelerate market acceptance of new energy technologies. Additionally, a deeper understanding of the influence of transformational leadership on consumer behavior can aid in designing better products and services as well as crafting effective education programs to enhance public awareness of energy sustainability.

2. Method

The method employed uses a qualitative approach to produce descriptive data [35]. The phenomenological approach in research explores the impact of transformational leadership on energy innovation aiming to understand the influence of transformational leadership on energy innovation from a consumer perspective. With a phenomenological approach, researchers strive to explore the subjective meanings assigned by individuals to participants' experiences [36].

The research focuses on a deep understanding of how consumers perceive transformational leadership that impacts energy innovation. The main goal is to explore the views, experiences, and assessments of consumers regarding the style of transformational leadership, and to understand how this type of leadership contributes to energy innovation [37].

The research was conducted over two months from March to April 2024. Participants consisted of five consumers from the general public who are energy users. Subjects were selected based on the principle of convenience, meaning that subjects were initially chosen by the researcher because they were known to have experience with the topic being studied and met specified criteria [38]. In this case, the researcher studied six subjects considering different consumer characteristics including:

Perceptions of Energy Innovation, Experience Using Products, Influence of Corporate Leadership, Communication and Information, Social and Environmental Impact, and Consumer Loyalty in using innovative energy products.

2.1. Data Collection

The techniques for data collection and processing include field observations, interviews, and literature review. Three types of data were analyzed to gather comprehensive information. Interviews were conducted in a semi-structured manner for approximately 30 minutes with each participant and recorded using a smartphone audio recording app. Data analysis began with the organization and arrangement of data into transcripts. These transcripts were read multiple times to obtain a complete overview of the data and to identify data segments that might reveal aspects of the phenomenon [39]. The researcher contacted and selected informants according to categories who were willing to be interviewed about the purpose and objectives of the study. With the triangulation method, the validity of data in qualitative research can be verified [40].

Table 1. Informant Respondent.

No	Name Responden	Gender	Age
1	Lia	Female	33 years old
2	Agustina	Female	25 years old
3	Agus	Male	35 years old
4	Maria	Female	23 years old
5	Johan	Male	40 years old

3. Results and Discussion

This research provides significant insights into how transformational leadership impacts innovation in the energy sector, offering benefits such as enhanced creativity and motivation within teams, and facilitating the design of corporate policies that support sustainable innovation. This not only boosts corporate productivity but also contributes to reducing carbon footprints and enhancing energy efficiency, demonstrating a broad positive impact on society and the environment. However, the study also highlights potential risks such as over-reliance on transformational leadership, which could sideline other effective leadership styles in certain situations, and biases in outcomes that may be more influenced by consumer expectations than by the leadership itself. The impact of this research is felt by various stakeholders including business leaders, decision-makers, the academic community, and consumers who benefit from more efficient and sustainable energy innovations, which in turn support global environmental sustainability.

3.1. Consumer perception of energy innovation

To better understand customer impressions of energy innovations given by companies, data was collected through a survey of innovative energy product users. Five respondents discussed how these advances effect their energy management and use, as well as their environmental impact. To protect the participants' privacy, the identities of the five research informants were masked and not written using their real names. According to the responses, there are recurrent themes that include an appreciation of: (1) Efficient and sustainable. Respondents expressed strong appreciation for organisations' efforts to integrate solutions that are not only efficient but also promote environmental sustainability. Technologies like efficient solar panels and sophisticated energy management systems are viewed as accelerators for lowering energy usage and environmental effect. (2) Dedicated to Innovation. The company's forward-thinking approach to creating and implementing new technology is praised, with a focus on sustainable resource use and carbon footprint reduction. This demonstrates a rising awareness that technology progress must be matched with ethical and environmental responsibilities. (3). The impact on costs and corporate image. Energy innovation is regarded not only as a cost-cutting measure, but also as a company image enhancer. Using technology that promote renewable energy and efficiency offers value to consumers and improves the company's reputation in the eyes of the public.

According to the researcher, this conclusion demonstrates that today's consumers place a high value on innovations that address not only modern technology but also sustainability and environmental efficiency. This worry reflects a shift in consumer ideals, in which environmental factors are considered when making purchasing decisions. Companies in the energy sector should

keep in mind that consumers are becoming more conscious of environmental issues and prefer enterprises that invest in technology that provide long-term solutions. Thus, innovations that combine efficiency, environmental impact reduction, and sustainability will not only benefit the firm financially, but will also improve consumer loyalty and the company's positive public image. According to the author, organisations should continue to investigate and invest in technologies that strengthen their commitment to sustainability and efficiency, in keeping with market expectations and corporate social responsibility.

3.2. Consumer Experience with Innovative Energy

Respondents gave very good feedback on the use of novel energy products such as solar panels and smart energy management systems. One caller stated how installing solar panels in his home not only decreased energy expenses but also enhanced household energy independence, with excellent customer service and an easy-to-use interface. Another responder identified the usage of energy management technologies via mobile apps as an influencing factor for increased convenience and control over household energy consumption. Other responders commended the solar panels' operational efficiency and the integrated energy management system, particularly the speedy and competent installation process. Experience with solar energy-based heating systems was favourable, with easy installation and intuitive user interfaces, confirming the technology's accessibility to non-technical users. The use of the intelligent energy management system in the workplace was rated as highly satisfactory, assisting in the efficiency of daily work and the optimisation of energy consumption.

Table 2. Respondent's Experience.

Responden	Product	Experience	Key Fitures
1	Solar Panels	Very Positive	Reduced costs, increased independence
2	Energy Management System	Highly Satisfactory	Efficient control via mobile app
3	Solar Panel with Energy Management	Highly Satisfactory	Fast installation, high efficiency
4	Solar Energy Heating System	Very Positive	Easy installation, intuitive interface
5	Smart Energy Management System	Highly Satisfactory	Optimization of energy use, work efficiency

This excellent experience shows that innovation in energy technology can play an important part in the shift to more sustainable energy solutions. The success of these goods is assessed not just by the technology utilised, but also by how well they meet and surpass consumer expectations for ease and everyday usefulness. Companies should continue to invest in technologies that prioritise not only technical advancements but also improved customer support and simplicity of use. According to researchers, the adoption of efficient and user-friendly new energy products has a high potential for increasing consumer pleasure while also contributing to global sustainability goals. This high satisfaction opens up chances for businesses to further increase the adoption of innovative technologies and demonstrate their commitment to the environment and society.

3.3. Consumer Perceived Benefits

Researchers' findings on the distinct benefits that consumers feel when employing novel energy solutions. Five respondents offered their experiences, providing insight into how new energy technologies can impact customers' financial, environmental, and psychological well-being. Several major themes arose from the data collected (given in table 3), demonstrating the direct benefits of modern energy technologies: All respondents identified a large reduction in monthly energy expenses as a primary benefit of implementing innovative energy solutions. This shows that excellent energy efficiency is one of the primary reasons for adopting new technology. Respondents emphasised the importance of contributing to environmental conservation efforts by using cleaner, renewable energy sources. This element not only fulfils environmental obligation, but it also improves personal happiness and social standing. The system is also recognised for providing energy stability and minimising reliance on the traditional power grid, which is critical during peak or disruption periods. One respondent said that having a renewable energy system boosted the value of their home, illustrating the long-term investment benefits of this technology. Respondents also

emphasised the usage of automation and smart controls, which allow for reduced energy waste and better productivity.

Table 3. Consumer Perceived Benefits.

Respondent	Financial benefits	Environmental contribution	Energy stability	Increased valuei	Efficiency and productivity
1	Energy costs down	Yes	Stability during peak	Not mentioned	Not mentioned
2	Energy costs down	Yes	Not mentioned	Not mentioned	Not mentioned
3	Energy costs down	Yes	Reduced dependency	Increased valuei	Not mentioned
4	Energy costs down	Yes	Reduced dependency	Not mentioned	Not mentioned
5	Operasional turun	Yes	Not mentioned	Not mentioned	Peningkatan produktivitas

We emphasise that modern energy technologies give enormous benefits to customers, not only economically, but also in terms of increasing quality of life through environmental conservation and enhanced energy independence. Increased property prices and productivity are additional benefits that reinforce the case for wider implementation of these technologies. These positive experiences highlight the enormous potential of novel energy technology to address some of the most pressing issues confronting modern civilisation, including the need for sustainable and efficient energy. Companies in this industry should use this feedback to continuously develop and modify their offers to meet consumer requirements and preferences, while retaining their commitment to innovation and sustainability.

3.4 The Role of Corporate Leadership in the Adoption of Innovative Energy Products

Respondents repeatedly emphasised the importance of leadership in deciding their preference for innovative energy technologies. All respondents agreed that leadership's tangible commitment to innovation and sustainability provided a solid foundation for their trust in the product. Leadership focused on sustainable solutions boosts the company's credibility and influences customers' purchasing decisions. Respondents believe that the company's long-term vision, as conveyed by its management, is vital. Leaders who can clearly see how their product or service contributes to a more sustainable future are highly appealing to environmentally sensitive customers. Leadership's capacity to properly explain the benefits and strategy of innovation is also deemed critical. This includes how they describe the benefits of their technology and long-term, sustainable deployment tactics.

Table 4. The Role of Corporate Leadership.

Respondent	Commitment to Sustainability	Long-term Vision	Effective Communication
1	Very important	Very important	Important
2	Very important	Important	Very important
3	Very important	Very important	Very important
4	Very important	Very important	Important
5	Very important	Important	Very important

According to the findings, devoted and communicative leadership not only promotes good product views, but also increases consumers' faith in the company's quality and integrity. Leadership that actively promotes sustainability and incorporates it into their business model and goods effectively contributes to environmental conservation efforts. This adds tremendous value for consumers who are becoming more aware of environmental issues. Effective and imaginative leadership inside energy organisations is critical in shaping consumer preferences and purchase decisions, particularly in a market that is increasingly focused on sustainability. Companies must recognise that long-term success in the innovative energy industry is dependent not only on the technical excellence of their goods, but also on their executives' capacity to ethically and strategically negotiate difficult sustainability concerns. To gain consumer trust and support, leaders

must maintain excellent communication, a clear vision, and an unrelenting commitment to long-term innovation.

3.5 Corporate Leadership Promotes Trust and Interest in Innovative Energy Products

Respondents emphasised honesty and integrity as leadership characteristics that influence their confidence and interest in the product. Transparency in communication and clear vision from company executives had a significant beneficial impact on respondents' evaluations. This involves transparency in sustainability activities, investment in R&D, and active participation in dialogue with communities and stakeholders. Actively discussing sustainability policies and engaging in dialogues about climate change and renewable energy boosts consumer trust that businesses are serious about their sustainability initiatives. Integrity displayed via candid communication of obstacles and triumphs in meeting sustainable goals displays genuine dedication, which favourably influences consumer trust and interest. Sharing information regarding a product's environmental impact and sustainable development efforts shows a company's dedication to the environment, which is highly valued by environmentally conscious customers. Leadership that exhibits attention to sustainable practices and green technologies confirms that the organisation is not only focused on profits, but also accountable for the planet's future.

Table 4. leadership aspects in increasing consumer trust and interest in products.

Respondent	Transparency	Integrity	Commitment Sustainability	Environmental Impact	Dedication Sustainable Practices
1	Very High	Very High	High	High	High
2	Very High	Very High	Very High	Very High	High
3	Very High	Very High	Very High	Very High	Very High
4	Very High	Very High	High	Very High	High
5	Very High	Very High	Very High	Very High	Very High

3.5 Corporate communication around the benefits and value of energy innovation

According to the responses, the following are some important aspects of the company's effective communication. The first respondent emphasised that the company uses a variety of platforms, such as websites, social media, and brochures, to convey the benefits of their products in a clear and understandable manner. This demonstrates the value of adopting plain language and broad accessibility in communication tactics. The second and fourth respondents stated that the utilisation of videos, webinars, and thorough FAQs on the company's website is useful. Visual media and interactive sessions, such as Q&A, enable a better knowledge of the product and its benefits. The third respondent applauded the organisation for giving out regular updates via email and social media that are both useful and easy to understand. The use of case studies and supporting statistics builds consumer trust and comprehension of the product's true impact. The fifth responder appreciated the constant and engaging use of numerous communication channels, which helped them comprehend the benefits of technology and its significance to economic and environmental challenges.

Table 5. Corporate Communication Evaluation.

Respondent	Media Used	Effectiveness Rating	Praised Aspects
1	Website, Social Media, Brochure	Very Good	Clarity, Easy to Understand
2	Videos, Webinars, FAQs	Highly Effective	Technical details, Contribution to the environment
3	Email, Social Media	Very Comprehensive	Regular updates, Presentation of real data
4	Social Media, Webinars, Website	Highly Effective	Interactivity, Clear and Engaging
5	Email, Social Media,	Highly Effective and	Consistency, Ease of understanding

According to the findings, firms' capacity to integrate multiple communication tactics and engaging and informative media is critical to their effective communication. The employment of broadly accessible visual, interactive, and text media is required to communicate the intricacies of novel energy products. This method not only promotes understanding, but it also deepens the company's relationship with its customers. This investigation suggests that the effectiveness of corporate communications in expressing the benefits and value of energy breakthroughs has a substantial impact on consumer trust and interest. Companies must constantly develop and modify their communication tactics to guarantee that they not only reach a larger audience, but also communicate their messages in the most effective and engaging way.

3.6 The company's concern for environmental and social issues

All respondents agreed that firms' concerns about environmental and social issues have a significant impact on their perceptions of energy innovation. Respondents stated that firms' efforts to reduce environmental effect and participate in social projects boosted their confidence and esteem. This perception is confirmed by their observations of companies that are not only focused on profitability but also display a clear commitment to social and environmental responsibility. Consumers place a high value on organisations that demonstrate a clear commitment to sustainability by reducing waste and using renewable energy sources. These activities not only boost the company's image, but also provide customers confidence that the things they buy support environmentally friendly methods. Corporate efforts that promote sustainability and social responsibility are viewed as an example of ethical and responsible leadership. It provides the sense that the organisation is sincerely dedicated to creating a better future.

Table 6. Company's Concern for Environmental and Social Issues.

Respondent	Increased Trust	Perceived Sustainability	Ethical Responsibility	Positive Environmental Impact
1	High	High	High	High
2	High	High	High	High
3	High	High	High	High
4	High	High	High	High
5	High	High	High	High

These findings indicate that corporations' concern for environmental and social issues not only enhances their image as responsible entities, but also has a major impact on consumers' opinions of the value and authenticity of the energy advances they provide. Consumers like to support companies that they can view as agents of positive change, who are not just creative in technology but also lead with social responsibility. Companies that successfully integrate environmental and social considerations into their operations and strategy tend to receive more positive feedback from customers. This demonstrates the need of focusing not just on innovation, but also on establishing good business practices in order to gain the trust and support of the public. Companies should try to be honest, ethical, and proactive on environmental and social concerns as part of their innovation and growth strategy.

3.7 Sustainable and Eco-friendly Energy Solutions

The five respondents all agree that they value and support the company's sustainability activities. The first reply emphasised the company's use of efficient solar panels and smart energy management systems in lowering its carbon footprint and demonstrating its ability to operate sustainably. The second and fifth responders praised the organisation for incorporating sustainable practices not only into the items they offer, but also in their manufacturing processes and daily operations, including packaging and distribution. The third and fourth respondents praised the company for its use of renewable resources and waste reduction, as well as its efforts to reduce energy consumption, which not only benefits the environment but also supports the company's image as a leader in sustainable energy innovation.

Table 7. Sustainable and Eco-friendly Energy Solutions.

Respondent	Innovative Technology	Integration Sustainability	Environmental Commitment	Carbon Footprint Reduction
1	Efficient Solar Panels, Energy Management	-	-	Yes
2		Overall Operation	-	Yes
3		Renewable Materials, Efficient Processes	-	Yes
4	Energy Efficient Product Development	-	Major Social Change	Yes
5	-	Products and Manufacturing	Ya	Yes

Researchers discovered that organisations' commitment to sustainability had a major impact on consumer views. Consumers place a high value on companies that prioritise earnings while simultaneously taking proactive steps to lessen their environmental impact and increase energy efficiency. These activities, which are frequently incorporated into numerous elements of a company's operations, help establish the company's image as a socially and ecologically responsible institution. Modern consumers are increasingly searching for businesses that exhibit a genuine commitment to environmental issues. A corporation's efforts to provide sustainable and environmentally friendly energy solutions boost consumer confidence while also positioning the company as a pioneer in sustainable innovation. To preserve and enhance consumer support, corporations must continue to invest in technologies and processes that promote environmental and social sustainability.

3.7 Product Use Continuity

Based on the replies provided, all respondents expressed a strong desire to continue utilising the company's unique energy goods or services. The first respondent stated that great experiences and the company's dedication to sustainability are the primary reasons for their continued use of the product. This trust is founded on satisfying product performance and consistent environmental activities. The second and third respondents emphasised product efficiency and environmental friendliness. Good customer service and consistent product quality strengthens their trust and contentment with the company. The fourth and fifth responders cited the product's dependability and effectiveness in increasing energy efficiency as reasons for sticking with it. This dependability, combined with the company's efficient support, produced a favourable environment for them to prolong their commercial connection.

Table 7. Potential Continuity of Product Use by consumers.

Respondent	Likelihood of Continued Use	Keys Factors
1	Very large	Positive experience, sustainability commitment
2	Very large	efficiency, environmental impact, customer support
3	Very large	Satisfaction with product performance, trust in company vision
4	Very large	efficiency, reliability, customer support
5	Very large	Product reliability, reduced utility costs, sustainability support

This conclusion suggests that consumers will continue to use products or services that are both efficient and environmentally friendly. Consumer trust and happiness, which are built on great experiences, excellent customer care, and the company's sustainability policies, are essential motivators for customers to remain loyal to the product or service. The product's dependability and efficacy in increasing energy efficiency have a significant impact.

Researchers discovered that customers who are pleased with a company's performance and social impact are more inclined to continue utilising its products or services. To retain and attract more customers, businesses must continue to emphasise product innovation, sustainability, and efficiency, as well as provide high-quality customer service. This devotion not only promotes client delight but also supports the overall environmental sustainability.

The study found that consumers have very positive attitudes towards energy innovation, with a particular emphasis on the efficiency, sustainability, and environmental impact of novel energy products. Respondents emphasised the importance of technology like solar panels and sophisticated energy management systems, which improve energy efficiency while simultaneously lowering prices and environmental effect. Reliability and company support are also required to improve consumers' commitment to continue using these items.

These findings are similar with previous studies [41] and [42], which discovered that product sustainability improves consumer perceived value and boosts brand loyalty. Meanwhile, the studies [43], [1] and [44] emphasised the significance of open and authentic corporate communication in increasing consumer trust and satisfaction with sustainable products. This study validates and expands on those findings by demonstrating that sustainability influences not just product perception but also purchasing motivation and consumer loyalty.

According to the survey results, customers today choose organisations that actively create and execute sustainable energy solutions. This necessitates that businesses focus not only on technology innovation, but also on holistic sustainability initiatives that encompass all elements of their operations. To attract and keep environmentally conscious consumers, a clear sustainability strategy must be conveyed successfully through many media, as well as a practical show of dedication to sustainable practices.

The study emphasises the need of using innovative energy technologies that not only provide cost-effective solutions but also aid in sustainability initiatives. Companies' success in today's and tomorrow's energy markets will be heavily reliant on their ability to combine innovation with sustainability, effective communication, and high consumer trust. Companies must acknowledge that sustainability has become an essential factor in consumer purchasing decisions, influencing perceptions of product value and pleasure. Combining innovative technologies with ethical practices and clear and effective environmental policies can help build long-term customer trust and support.

4. Conclusion

According to the research, consumers place a high value on energy innovation, notably efficiency, sustainability, and environmental effect. Respondents gave high marks to technology like solar panels and smart energy management systems, which improve efficiency while lowering costs and environmental effect. Product reliability and company support are crucial in ensuring consumer commitment to using these items. The findings show that sustainability effects not only product views, but also purchases and consumer loyalty. Consumers today favour companies who are proactive in developing sustainable energy solutions. As a result, businesses are required to not only prioritise technology innovation but also incorporate sustainability into all aspects of their operations. To attract and keep environmentally conscious consumers, effective communication and demonstrable commitment to sustainability are required. Companies' performance in today's energy market is heavily reliant on the integration of innovation and sustainability, both of which promote environmental preservation. Sustainability is increasingly a key consideration in consumer purchase decisions, influencing perceptions of product value and satisfaction. Combining technological innovation with ethical behaviours and transparent and effective environmental policies can earn customers' long-term trust and support.

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Declarations

Author contribution. The author solely contributed to the conceptualization, research design, data collection, analysis, and writing of this paper. All aspects of the study, including literature review, interviews, and observations, were conducted and compiled by the author.

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Data and Software Availability Statements

The data and software used in this study are not publicly available due to the qualitative nature of the research. All data generated and analyzed during the study were collected from interviews and observations with consent from participants. Supporting literature is available from publicly accessible academic databases.

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