FUDMA JOURNAL OF ACCOUNTING AND FINANCE RESEARCH [FUJAFR]
VOLUME 3, ISSUE 3; ISSN: 2992-4693 (ONLINE); 2992-2704 (PRINT)

Shareholders' Preference for Corporate Renewable Energy Finance in Nigeria

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https://doi.org/10.33003/fujafr-2025.v3i3.229.202-217

Abstract
This study explores shareholders RE preferences (technology, cost, availability, and capacity) as a determinant of RE project finance during energy transition. The data for the study were generated from a sample of 400 shareholders of firms listed in the Nigeria Exchange Group (NGX) through a questionnaire survey. The Kruskal-Wallis' estimation techniques were deployed to analyze the data and measure the convergence of shareholder preferences towards RE projects. The results suggest that shareholders have divergent preferences on energy cost across different technology capacities. Similarly, the results suggest that shareholders have divergent preferences on durability across different energy technologies. However, the shareholders showed convergent preferences on availability of energy resources irrespective of energy technology. These results have implications for corporate REF because shareholders assume significant role in corporate investment decisions. These novel findings suggest that shareholder's preference is a significant determinant of REF. Therefore, policymakers should consider these preferences as a guide in reassessing, evaluating and reviewing energy transition plans, particularly those aspects that affect private investment.

Keywords: Energy, Finance, Renewable, Shareholders, Transition.

1. Introduction

Sustainable Development Goal 7 (SDG 7) promotes accessibility to affordable, reliable, sustainable Renewable Energy (RE) to the world's citizens. RE refers to power derived from natural sources that are constantly replenished, such as sunlight, wind, rain, tides, and geothermal heat. In Nigeria, the development of green energy has become increasingly important due to the country's overreliance on fossil fuels, poor access to electricity, and growing environmental concerns (Chirambo, 2016). Nigeria has the largest population in Africa (over 200 million people), yet around 40% of Nigerians still lack access to electricity, particularly in rural areas. This focus is directed toward Nigeria's energy sector, which has historically been dominated by oil and gas and accounts for over 80% of electricity generation with an installed generation capacity of about 13,000 MW, but only around 4,000–5,000 MW is reliably available on the grid, which is far below national demand. The country is pushing harder to ensure improved availability of energy resources through RE technology (Boubellouta & Kusch-Brandt, 2023; IISD, 2022; Jibril et al., 2022, Jibril et al., 2024; Taghizadeh-Hesary, 2020). To tackle this challenge, the country rolled out the Energy Transition Plan (ETP) to improve energy availability while addressing global warming. The transition necessitated the need to develop a green energy finance strategy to support sustainable energy development and practices and drive transitioning from fossil fuels to RE sources, with corporate finance to assume a significant role in the transition. Shareholders, being the owners of these organizations, influence major financing decisions; hence, there is the need to focus on their preferences because shareholders determine investment profile of RE project.

According to the Nigerian Investment Promotion Commission (2020), REI is planned to address Nigeria's energy crises and support its energy needs. Additionally, REI support Nigeria's climate change obligations under the Paris Agreement to promote RE and reduce carbon emissions. Backed by a supportive government and increasing capital from investors and donors, RE is fast emerging as one of Nigeria's most exciting new sectors. With an average of 6.25 hours of sunshine daily across the country, alongside hydropower, biomass, and wind potential, Nigeria is strategically placed to capitalize on technological improvements in the sector and accessibility to RE sources (NIPC, 2020). In November 2021, at the UN Climate Change Conference (COP26) held in Glasgow, Nigeria expressed its commitment to achieving net-zero emissions by 2060 (United Nations, 2021). Following this declaration, Nigeria launched an ETP on August 24, 2022, which established the strategy to reach a net-zero emissions energy system by 2060 (Dioha, 2022). However, the current funding flows are less than 50%, leading to an over $5 billion annual deficit, as international institutions such as the World Bank and African Development Bank (AfDB) provide less than $1 billion annually. Private sector investments led by corporate organizations are expected to fill the funding gap. Mazzucato and Semieniuk (2018) and Elie et al. (2021) noted that private sectors must invest to support resilience and successful innovation of the RE system. Nigeria needs to accelerate REI by exploring and prioritizing solutions to unlock capital for Nigeria's RE priority areas (World Economic Forum, 2023). Shareholders' energy preferences could be a crucial determinant of corporate energy project finance to bridge the funding gap. Thus, assessing shareholder preferences for REF assumes a vital research undertaking. Recent empirical studies on mobilization of REF, such as Taghizadeh-Hesary and Yoshino (2020), Bhattarai (2015), Chaklader and Gulati (2015), Hassan (2022), and Lam and Law (2016), revealed the need to identify more determinants of REF in order to mobilize various financial actors for RE projects.

Do et al. (2024) studied the various determinants of REF but did not consider the investors' (shareholders') preferences toward RE attributes. However, Mazzucato and Semieniuk (2018) posited that financial actors' preferences are important finance drivers and vary considerably in the composition of energy investment portfolios, which create directions toward particular technologies and increase investment intensity over time. Thus, assessing the significance of shareholder preferences is an important energy transition plan. Despite the significance of these preferences in stimulating RE project finance over time, an extensive review of literature revealed that studies on shareholder preferences as determinant of corporate RE finance is rare. This study adds to existing literature of REF as a novel assessment of shareholder preferences to ascertain the direction of REI with respect to technology, cost, durability, and payback period.

The current study, set against the background of SDG 7, explores the dynamics of shareholder RE project finance preferences in the context of Nigeria's evolving energy landscape, emphasizing shareholders' influence on corporate strategies, financing decisions, and the overall transition toward sustainable energy solutions for affordable RE for Nigerian citizens. Analyzing shareholders RE project finance preferences provides insights into the potential drivers and barriers for scaling up green energy initiatives in Nigeria (Hassan, 2022; Homroy, 2023; Jibril et al. 2022; Jibril et al. 2024; Jibril, 2025; Saidu et al., 2018). Therefore, the aim of this study is to examine shareholders' preferences regarding corporate green energy finance in Nigeria, with a focus on evaluating how key factors such as energy type, capacity, durability, and return period influence their investment preferences. The remainder of the paper is organized as follows: Section 2 presents a review of relevant and related literature on REF; Section 3 explains the research methodology adopted to test the null hypotheses; Section 4 presents results and discussion therefrom; and Section 5 presents the conclusion of the study.

2. Literature Review

This section presents the concept Energy Transition Plan (ETP) in Nigeria and review of relevant literature on the determinants of RE finance.

Nigeria Energy Transition Finance

In 2022, the government launched an Energy Transition Plan (ETP) with a mission to achieve net-zero emissions by 2060, fulfilling a commitment made at COP26 in Glasgow. The funding requirement to reach the net-zero emissions target by 2060 is estimated at $1.9 trillion, with a plan to invest $410 billion in funding by 2060 through an incremental annual funding of $10 billion to achieve the energy goal. Nigeria reiterated its commitment to a just and seamless energy transition and called on the private sector to assume its finance role in the plan to achieve this (United Nations, 2021). The ultimate goal of the government is to mobilize finances to implement the plan seamlessly to attain SDG 7 by 2030 and net-zero emissions by 2060. Funding is identified as the major challenge, considering the cost of changing over from carbon energy sources to renewable energy. Notably, the transition plan and its objectives may be difficult to realize, and the deadline may not be achieved without adequate funding. Hence, corporate organizations are expected to assume significant funding responsibility.

The government has noted that the significant financiers for energy transition are the private sector and promised to institute adequate incentives in order to attract appropriate investment from the sector. As a result, numerous fiscal incentives and sector reforms were put in place to stimulate private sector investment; these include a tax holiday for an initial three-year grace period for corporate entities that invest in independent power generation. Other reforms now being implemented to foster private sector investment involve the establishment of a Climate Change Fund, as contained in the Climate Change Act (2021), and redirection of Nationally Determined Contributions (NDCs) to a net-zero pathway.

However, the major challenges likely to arise include inadequate knowledge of RE projects, deficient information, high perceived risks, and lack of appropriate funding instruments. Hence, the government should work with banks to establish project finance structures for RE and energy efficiency projects that could be standardized and widely replicated across various banks. Thus, this study provides the views of owners of corporate organizations' preferences, which depict their knowledge of RE to support government efforts toward profiling the incentives and reforms needed to stimulate private sector investment. The shareholders' perspectives established by this study could inform the financial vehicles that attract adequate funding for the transition while providing diversification for investors and grounds for rapid corporate energy project approval.

Determinants of Renewable Finance

REF is topical because of the need to preserve the environment and fight global warming. Thus, it is considered a major climate action rooted in the sustainable development theory that seeks to ensure that the current generation preserves resources for future generations by preserving the environment through the use of renewable energy. On this, Steffen (2018) posits that project finance for RE projects and the underlying drivers of the finance are important. However, Wiser and Pickle (1998) found that one of the key obstacles to successful transition is that finance information is frequently overlooked in designing and executing policies on renewable energy.

Quite a number of studies were conducted on mobilizing finance for RE globally. For instance, Eberhart et al. (2025) examined REI and found that a huge part of RE project finance in OECD countries is

characterized by foreign direct investment, featuring mainly wind and solar photovoltaic (PV) technologies. In relation to investor preferences, Mazzucato and Semieniuk (2018) analyzed investors' preferences in skewness, size, and risk of energy project portfolios and technology composition. They discovered varying risk portfolio preferences for RE in relation to technology investment, featuring low-risk preferences by private energy investors compared to public counterparts. In analyzing these preferences, Le et al. (2020) posits that investing in RE requires a sophisticated finance structure to cope with risk complexity over technology evolution.

On the determinants of REF, Do et al. (2024) found that financial decisions, prior beliefs, and legal obligations are effective determinants of RE project finance. Meanwhile, Corrocher and Cappa (2020) found that alternative technology, fossil fuel availability, feed-in tariffs, and caps on private finance are stimulants of private finance for renewable energy. Further, Ali et al. (2022) discovered that good governance, financial support, and policy instruments are drivers of REF. In addition, Mendelsohn (2012) and Abolhosseini and Heshmati (2014) found that government support frameworks for RE in terms of investment tax reliefs stimulate finance.

On the role of the financial sector in energy finance, Painuly and Wohlgemuth (2019) indicated that an innovative financial system is an enabler of RE technology finance. Accordingly, Brunnschweiler (2010) found that commercial banking has a huge impact on REI after the implementation of the Kyoto Protocol. In this line, Le et al. (2020) revealed that the development of the financial sector is a key driver of RE deployment but appears less significant in low-middle-income nations than in high-income ones. From the review, it is evidenced that shareholder preference for REF is largely ignored. This study makes novel contribution to existing literature by assessing shareholder REI project preference.

3. Methodology

The population consists of shareholders of companies in five sectors listed on the Nigeria Exchange Group (NGX), who were numbered at least 682,100 as of December 31, 2024. Four hundred shareholders participated in the survey. The sample size was determined based on the guidance of Yamane (1973) as follows:

$$n = \frac{N}{1 + Ne^2}$$

$$n = \frac{682{,}100}{1 + 682{,}100\ (0.05)^2}$$

$$n = \frac{682{,}100}{1706.25}$$

$n = 399.76 = 400$

Where:
(n) = sample size
(N) = population size
(e) = error (0.05) at a reliability level of 95%

A 5-point Likert scale questionnaire, adapted from Baker (2015) and Salawudeen et al. (2022), was administered to shareholders. The surveys were distributed through emails and social media sites using a Google Form and physically. This was followed by phone calls to most of the researchers' acquaintances to ensure a timely response (Bakar et al., 2019). A pilot test to validate the instrument with ten academic shareholders was conducted. Factor analysis was performed on the main survey responses to test the

reliability and validity of the survey instrument (Balzan & Baldacchino, 2007). All the items have a coefficient greater than 0.50 and are regarded as good. Kruskal-Wallis' estimation techniques were adopted to assess the variability of shareholders' preferences for RE project finance. This technique is appropriate because the variables of the study are measured at an ordinal scale level. The SPSS Version 22 statistical software package was used for data processing and analysis.

4. Results and Discussion

This section presents the results of data analysis and discussion thereof. The response rate from the survey is 100 percent, as all the questionnaires were completed and returned by the respondents.

Descriptive Statistics

The table presents the frequency distribution of technology brand, energy capacity, durability, availability, cost, and return, offering a comprehensive overview of shareholders' preferences across different RE technologies.

From the results in Table 1, a significant majority, 67.8%, prefer solar radiation, highlighting its popularity among investors. This dominance could be linked to solar energy's declining costs, scalability, and adaptability in the Nigerian climate (Eberhart et al., 2025). Solar's appeal also mirrors global investment patterns, where photovoltaic systems have attracted significant cross-border financing. In contrast, hydropower (14.8%) and nuclear power (9.3%) show moderate appeal, while biomass (3.3%) and wind power (4.9%) attract less interest. These variations suggest that technology type greatly influences investment decisions, possibly due to perceived risks, technical complexity, and environmental impact (Mazzucato & Semieniuk, 2018). The low investment interest in biomass supports findings by Eberhart et al. (2025) that biomass tends to be domestically financed and less internationally attractive. The preference pattern highlights the importance of perceived reliability and risk levels in green technology finance (Steffen, 2018). It implies that policies promoting solar energy may face the least resistance from shareholders and could stimulate broader RE adoption. The minimum rating for technology brand preference was 1, the maximum was 5, with a mean of 4.31 and a standard deviation of 1.198, suggesting a high overall preference with some variability in responses.

Table 1: Descriptive Statistics

	Percent	Minimum	Maximum	Mean	Std. Dev.
Brand (Technology)		1	5	4.31	1.198
Wind Power	4.9				
Nuclear Power	9.3				
Biomass	3.3				
Hydro Power	14.8				
Solar Radiation	67.8				
Energy Capacity (Megawatts)		1	5	4.02	1.358
1000	8.7				
2000	8.7				
3000	14.2				
4000	10.4				
5000	57.9				
Durability		2	5	4.16	0.809
Lower Quality	2.7				
Moderate Quality	17.5				
Higher Quality	40.4				
Much Higher Quality	39.3				
Availability		1	5	4.25	0.914
Scarcely Available	2.2				
Moderately Scarcely Available	3.8				
Slightly Available in Abundant	7.7				
Moderately Available in Abundant	39.9				
Very Much in Abundant	46.4				
Take-off Cost		1	5	2.83	1.414
Tens of Million	23.0				
Hundreds of Millions	24.0				
Tens of Billions	16.4				
Hundreds of Billions	20.2				
Trillion N	16.4				
Period of Return		1	5	3.34	1.341
9-10 years	15.3				
7-8 years	8.7				
5-6 years	25.7				
3-4 years	26.8				
1-2 years	23.5				

Source: Survey, (2025)

On the preferences based on energy capacity, 5,000 MW dominates with 57.9%, followed by 3,000 MW (14.2%) and 4,000 MW (10.4%). Shareholders show a strong inclination toward higher-capacity projects, likely due to the perceived economies of scale, better returns, and greater impact (Wiser & Pickle, 1998). High-capacity projects are more attractive for institutional or foreign investors, as they align with global trends in capital deployment toward utility-scale infrastructure (Eberhart et al., 2025). Low-capacity options like 1,000 MW and 2,000 MW jointly attract only 17.4%, reinforcing a possible perception of insufficient profitability. This capacity-based preference aligns with Steffen's (2018) finding that RE investors favor projects that offer substantial returns with reduced risk when proper financial structuring

is present. However, given that large-scale capacity requires significant capital, financing limitations in developing economies, as noted by Brunnschweiler (2010), remain a barrier. Thus, the data emphasize the need for policy support and innovative financing structures to enable shareholders to back high-capacity renewable ventures in Nigeria. The minimum capacity rating was 1, the maximum was 5, with a mean of 4.02 and a standard deviation of 1.358, indicating a leaning toward higher capacities with moderate variance.

Moreover, the table presents data on shareholder preference based on product durability. Higher quality (40.4%) and much higher quality (39.3%) dominate, while moderate and lower quality technologies collectively account for only 20.3%. This shows that durability is a decisive factor in investment decision-making, possibly due to concerns over long-term returns and operational efficiency (Le et al., 2020). Investors may associate durability with lower maintenance costs and fewer technical disruptions. These findings align with Brunnschweiler (2010), who argues that financial institutions and shareholders value technological reliability, especially in underdeveloped financial systems where risk tolerance is lower. The preference for higher durability also highlights the need for policymakers to incentivize durable technology adoption through guarantees, risk mitigation, or subsidies (Abolhosseini & Heshmati, 2014). Moreover, as emerging technologies evolve, public and private sector support will be essential to overcome durability-related perception barriers that may deter investment, particularly in new or less-tested technologies. The minimum durability rating was 2, the maximum was 5, with a mean of 4.16 and a standard deviation of 0.809, indicating a strong preference for more durable technologies with relatively low dispersion in responses.

Also, the table shows that 46.4% of respondents perceive RE options as very much available in abundance, while 39.9% consider them moderately available in abundance. Only a small proportion view them as scarce. This general perception of availability can positively influence investment decisions, as access to raw energy resources reduces risk and improves the feasibility of projects (Chirambo, 2016). The confidence in energy availability also reflects improved public awareness and perhaps the growing grid and off-grid renewable infrastructure across Nigeria. According to Eberhart et al. (2025), capital mobility in RE markets depends on resource availability and infrastructure. Where availability is high, cost-effective financing becomes more feasible. Thus, stakeholders' belief in the abundance of RE options supports the notion that Nigeria's RE market is maturing. However, Chirambo (2016) warns that in regions like Sub-Saharan Africa, such perceptions may not align with the reality of grid limitations and distribution inefficiencies. Therefore, while availability perceptions are positive, they must be supported by infrastructure investments and policy reforms. The availability ranged from a minimum of 1 to a maximum of 5, with a mean score of 4.25 and a standard deviation of 0.914, showing generally high perceived availability with limited divergence in opinion.

Take-off cost reveals a relatively even spread of preferences. Hundreds of millions (24.0%) and tens of millions (23.0%) lead, while hundreds of billions and trillions of Naira attract a combined 36.6%. This suggests that shareholders are sensitive to initial capital requirements and prefer projects with moderate upfront investment. These findings echo Le et al. (2020), who assert that access to finance, not just in quantity but in structure, is critical to RE adoption. Wiser and Pickle (1998) emphasize that project viability is often compromised by overlooked financing complexities, especially in settings where upfront costs can be a barrier. Stakeholders' reluctance toward large-scale initial investments also suggests a lack of trust in long-term government or market guarantees. For Nigeria to scale renewable energy, particularly for large projects, mechanisms such as feed-in tariffs or blended finance may be

necessary to lower capital entry thresholds and improve investor confidence (Abolhosseini & Heshmati, 2014). The minimum value for cost was 1, the maximum was 5, the mean was 2.83, and the standard deviation was 1.414, suggesting moderate concern regarding investment cost with considerable variation in responses.

The table indicates a preference for shorter investment return periods, with 3–4 years (26.8%) and 1–2 years (23.5%) being most preferred. This confirms that return duration is critical in investment decisions, likely due to high capital costs, policy uncertainties, or economic volatility. Long-term return periods, such as 9–10 years (15.3%), are the least preferred. These preferences mirror findings from Steffen (2018), who notes that in uncertain regulatory environments, investors shy away from long-term horizons unless backed by robust guarantees. Brunnschweiler (2010) also highlights the importance of financial intermediation in reducing perceived risks over longer return cycles. Moreover, Mazzucato and Semieniuk (2018) found that public financial actors are more likely to take on long-term risks, while private actors concentrate on shorter, safer returns. Therefore, return period expectations are not merely financial but also reflect trust in governance, inflation stability, and energy pricing mechanisms. For Nigeria, this suggests an urgent need for policy frameworks that enhance return predictability to mobilize both local and international capital into green energy finance. The minimum return period score was 1, the maximum was 5, the mean was 3.34, and the standard deviation was 1.341, indicating moderate average expectations for return time with substantial variability in preferences.

4.2 Correlation Analysis

Table 2: Correlation Statistics

Variable 1	Variable 2	Why This Pair?	Coefficient
Cost	Return	To see if shareholders perceive high-cost options as having higher/lower return.	-0.236
Availability	Return	To determine if more available energy sources are seen as more profitable.	0.016
Brand	Quality	To examine whether preference for a brand is associated with perceived quality.	0.117
Brand	Availability	To assess if more preferred brands are also seen as more available.	0.090
Cost	Quality	To check whether costlier options are rated higher or lower in quality.	0.087
Capacity	Return	To evaluate if energy capacity influences expected return.	0.030

Source: SPSS (Version 22).

Note: The rule of thumb for correlation matrix is: 1–10% = very weak association, 11–29% = weak association, 30–60% moderate association, and 61% and above strong association.

The correlation analysis presented in Table 2 provides valuable insights into the interrelationships among key variables influencing shareholders' preferences in corporate green energy finance in Nigeria. The negative correlation between cost and return (-0.236) suggests a weak inverse relationship, implying that shareholders tend to associate higher-cost energy options with lower expected returns. This may reflect the cautious investment behavior seen in developing economies, where cost-efficiency remains a dominant factor in energy project evaluation. Such findings are consistent with Abolhosseini and Heshmati (2014), who noted that lower-cost policies like feed-in tariffs and carbon tax incentives are

preferred when the goal is to enhance the financial appeal of RE technologies (RETs). The marginal positive correlation between energy availability and expected return (0.016) indicates an almost negligible relationship, suggesting that availability alone does not strongly influence return expectations. This contrasts with the assumption that greater accessibility of green technologies correlates with better investment returns, highlighting a possible lack of infrastructure or regulatory support, as noted by Chirambo (2016), who emphasized that systemic financial and governance challenges hamper the deployment of renewable systems in Sub-Saharan Africa.

The relationship between brand preference and quality (0.117) reflects a weak positive correlation, suggesting that shareholders marginally perceive certain brands as offering higher quality. While this is not a strong association, it does align with the findings of Steffen (2018), which observed that project finance is more accessible for established technologies or trusted project developers, pointing to brand reputation as a subtle but important factor. Similarly, the correlation between brand and availability (0.090) is also weak, indicating that preference for a brand does not necessarily equate to perceived availability. This may reflect information asymmetry in the market or limited visibility of credible providers, especially in emerging markets where infrastructure is fragmented, as highlighted by Elie et al. (2021). Furthermore, the weak correlation between cost and quality (0.087) reveals that higher costs are not automatically interpreted as indicators of higher quality among shareholders. This challenges traditional market perceptions and supports Wiser and Pickle's (1998) assertion that RE policy designs often fail to align perceived value with financing frameworks, causing investor skepticism. The near-zero correlation between capacity and return (0.030) suggests that shareholders do not see larger-capacity energy solutions as necessarily more profitable. This aligns with Brunnschweiler (2010), who argued that underdeveloped financial systems in non-OECD countries often restrict capital flow to high capacity RETs due to risk aversion and limited credit channels.

The overall implication of these results shows the importance of rethinking financial structuring and investor engagement strategies in Nigeria's green energy sector. Despite weak correlations, the associations reflect key perceptions and preferences that influence investment decisions. It affirms that addressing non-cost barriers such as brand trust, availability, and perceived quality could enhance capital flow into green energy projects. Furthermore, as Eberhart et al. (2025) demonstrate, international investment in RETs thrives where financial systems are aligned with policy and investor expectations, implying that Nigeria must strengthen its financial ecosystem, improve transparency, and build investor confidence to accelerate RE financing, growth and development.

4.3 Kruskal Wallis Test of Variability

Table 3: Kruskal Wallis Test Results

	Hypothesis (Ho)	Factor	Kruskal Wallis H	Sig.	Decision
Shareholders' Preference for Brand Technology on Energy Capacity	H1	Dependent Variable: Preference for Brand Technology Factor (Grouping Variable): Energy Capacity	1.802	.772	Supported
Shareholders' Preference for Cost-effectiveness on Energy Capacity	H2	Dependent Variable: Preference for Cost Factor (Grouping): Energy Capacity	5.248	.263	Supported
Shareholders' rating of Availability on Energy Capacity	H3	Dependent Variable: Rating of Availability Factor (Grouping Variable): Energy Capacity	4.763	.312	Supported
Shareholders' Preference for Brand Technology on Durability	H4	Dependent Variable: Preference for Brand Factor (Grouping Variable): Durability Level	8.073	.045	Not supported

Source: SPSS V22

Table 3 reports the Kruskal-Wallis' test outcomes used to examine shareholders' preferences across different dimensions of corporate green energy finance in Nigeria, namely technology brand on energy capacity, cost-effectiveness on energy capacity, availability across technology types, and technology brand on durability. The first hypothesis investigated whether shareholders' preference for technology brand differs significantly across levels of energy capacity. The test yielded H = 1.802 with a p-value of 0.772, which is above the 0.05 threshold. Therefore, the null hypothesis is not rejected, indicating no significant difference in the distribution of shareholders' brand preferences across different categories of energy capacity. This result demonstrates that investors rank technology brand similarly, irrespective of whether the project involves smaller or larger energy capacity. The finding reflects a uniformity of perception among Nigerian shareholders, consistent with Eberhart et al. (2025), who argued that RE investors in mature markets such as wind and solar often allocate capital in similar ways across project types and sizes because of standardized investment models and technology maturity. Wiser and Pickle (1998) further observed that, in the absence of clear policy incentives or distinct product differentiation, investor preferences tend to cluster uniformly. In the Nigerian case, the implication is that energy capacity itself is not a decisive factor shaping brand preference; rather, shareholders appear to focus on other project characteristics such as durability or return outlook. This suggests the need for policymakers and corporate actors to develop strategies that emphasize distinguishing factors beyond capacity if they wish to influence investor decisions.

The second hypothesis assessed whether shareholders' preference for cost-effectiveness varies across different levels of energy capacity. The Kruskal-Wallis' statistic was H = 5.248 with a p-value of 0.263, which again exceeds the 0.05 significance level. This result means the null hypothesis cannot be rejected, confirming no statistically significant difference in shareholder ranking of cost-effectiveness across energy capacity levels. The interpretation is that Nigerian shareholders consider cost-effectiveness relatively stable and not capacity dependent. Regardless of whether the project is designed for lower or higher megawatt outputs, investors appear to evaluate cost factors consistently. This outcome aligns with Brunnschweiler (2010), who emphasized that financial systems in developing economies are often constrained and unable to adjust effectively to variable project sizes in renewable energy. Similarly, Steffen (2018) showed that RE project financing structures do not necessarily scale with project capacity but are instead tied to broader financial realities and structuring norms. Within Nigeria's financial context, where capital markets remain underdeveloped, this result highlights the importance of designing green finance mechanisms that are standardized and simplified. Standardization can reduce due diligence costs, increase transparency, and make projects more attractive across capacity scales. By not tailoring financing exclusively to capacity levels, policymakers and corporations may reach a wider pool of investors who perceive cost advantages in uniform terms.

The third hypothesis examined whether shareholders' ratings of availability differ significantly across technology types. The Kruskal-Wallis' test produced H = 4.763 with a p-value of 0.312, which is not statistically significant at the 5% level. The null hypothesis is therefore retained, indicating that shareholders perceive the availability of green energy technologies in Nigeria in broadly similar terms. This means investors do not significantly distinguish between solar, hydro, wind, biomass, or other renewable technologies in terms of their availability. Although surprising given the geographical variation of resources in Nigeria, the finding can be explained by limited awareness and information gaps among investors. However, Chirambo (2016) stressed that RE deployment in Sub-Saharan Africa is undermined by regulatory opacity and insufficient stakeholder education, which in turn affect investor perceptions. Elie et al. (2021) also observed that investment discourse often centers on mature technologies such as solar and wind, reinforcing a generalization among investors about technological availability. The implication for Nigeria is that investors may lack access to credible information about local resource abundance, technical feasibility, or infrastructural limitations. Consequently, project developers and policymakers must prioritize disseminating clear, location-specific data and ensure transparency in technology assessments. Such actions could help correct uniform but misinformed perceptions, enabling shareholders to evaluate availability more accurately and support targeted investments.

The fourth hypothesis investigated whether shareholders' preference for technology brand differs significantly across durability levels. Here, the Kruskal-Wallis' result was H = 8.073 with a p-value of 0.045, which is below the 0.05 threshold. The null hypothesis is therefore rejected, demonstrating that durability is a significant factor influencing how shareholders rank technology brands. Unlike the other dimensions, where uniformity prevailed, durability emerges as a distinguishing attribute that materially affects investor decisions. Shareholders in Nigeria appear to place strong emphasis on the expected lifespan and reliability of RE technologies when forming preferences. This finding agrees with Le et al. (2020), who found that financial development strongly influences RE deployment, particularly in contexts where durable, low-maintenance infrastructure is prioritized. Mazzucato and Semieniuk (2018) also emphasized that financiers vary in their tolerance for technological risks, with durability serving as a central consideration in asset allocation. In the Nigerian context, where technical reliability and

maintenance challenges are persistent, the significant role of durability underscores the importance of building investor confidence through quality assurance, certification, and maintenance guarantees. Abolhosseini and Heshmati (2014) similarly argued that financial support mechanisms for RE must integrate technological features such as durability to align with investor priorities. This indicates that in Nigeria, energy developers must actively highlight durability benefits and provide warranties or contractual assurances to attract shareholder investment.

Thus, the Kruskal-Wallis results show that across three of the four tested hypotheses—brand preference on energy capacity, cost-effectiveness on energy capacity, and availability across technology types—there are no significant differences in shareholder rankings. The lack of variation suggests a uniformity of perception among Nigerian shareholders, which may reflect limited market development, weak investor education, or structural financial constraints. Only in the case of durability does a significant difference emerge, pointing to its critical role in shaping investor preferences. This outcome has important implications. First, it indicates a need for targeted policy interventions that promote transparency and education about technology differences, particularly in relation to availability and cost structures. Second, it highlights the importance of durability as a communication point for developers seeking to attract investment. Finally, the results suggest that Nigerian shareholders may currently undervalue capacity and availability distinctions due to information asymmetry, which requires urgent correction if the RE sector is to grow sustainably. As emphasized by Steffen (2018) and Brunnschweiler (2010), overcoming financial and informational asymmetries is central to advancing green energy finance. Therefore, strengthening investor awareness and prioritizing durability-focused assurances could better align shareholder interests with Nigeria's long-term RE goals.

5. Conclusion

The study results suggest that there are reasons to be optimistic about the energy transition plan going forward. Particularly, the evidence indicated widespread positivity regarding the prospects for finance for RE projects from the shareholder survey. Similarly, the survey of project developers indicated that the positive link between prior experience and the propensity to become involved again in crowdfunding for RE sources was also evident among these groups. Based on the study's objective to explore shareholders' preferences for corporate green energy financing in Nigeria and the findings from the Kruskal-Wallis' estimation analysis, several key insights emerge. Our findings showed that there is congruence in shareholders' preferences for RE technologies of solar, hydro, wind, nuclear, and biomass in relation to various energy capacity levels. This evidence suggests that shareholders give priority to flexibility in technology options over specific capacity considerations. Similarly, the consistency of shareholders in terms of their preference for cost-effectiveness across different energy output capacities is an indication that financial efficiency is the major target, irrespective of the project scale. On the comparable perception of energy source availability, shareholders' views clearly indicate that solar, hydro, wind, biomass, and nuclear technologies are considered similar options in terms of viability for investment in the context of Nigeria.

However, the variability exhibited by the results in preference for technology brands in relation to their durability levels indicates that shareholders desire brands with longevity and reliability. Taking the results of the survey together, the findings underscore that the indifference of the shareholders about technology type serves as a critical factor that could influence their firms RE project finance decisions. These preferences in terms of technology, cost, durability, and capacity play a crucial role in determining capital allocation to RE projects and set the strategic direction of RE initiatives of companies, which can

significantly accelerate the achievement of energy transition plan targets and foster the attainment of sustainable development goals in Nigeria. Thus, providing the funding mechanisms to accelerate RE adoption, sustainability ensures that these transitions balance the much-needed environmental protection, economic growth, and social equity. These two can form the backbone of a low-carbon, resilient economy for Nigerians. Our study recommends that the government and policymakers engage shareholders and communicate constantly through regular updates, as the technology, cost, capacity, and durability are rapidly changing in the short run-in order to align their preferences with rapid innovations in the RE sector.

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Acknowledgements

The researchers acknowledge the support of the Tertiary Education Trust Fund (TETFund) for financing this research work.

Appendix

Survey questionnaire

Shareholder preference for corporate renewable energy project finance in Nigeria

This survey assesses shareholders' preference of the attributes of renewable energy project in Nigeria. Shareholders are expected to indicate their preference by selecting any of the six attributes of renewable energy projects. For any of the attributes preferred, kindly select the levels considered appropriately.

Information: Please Tick

S/N	Attributes	Level 1	Level 2	Level 3	Level 4	Level 5
1	Select the energy brand or types you would prefer to embark upon	SR	HP	BM	NP	WP
2	What is the energy capacity or size would you prefer	5,000 or more 1 MW	4,000 1 MW	3,000 1 MW	2,000 1 MW	Up to 1,000 1 MW
3	Which of the energy durability or quality would you prefer	MHQ	HQ	MQ	LQ	MLQ
4	Indicate the energy source availability that would ensure the smooth take off of the project	VAA	MAA	SAA	MSA	SA
5	Determine the cost of energy in Naira that you would prefer as takeoff cost.	₦Trillion	Hundreds of ₦Billion	Tens of ₦Billion	Hundreds of ₦Million	Tens of ₦Million
6	Which of the energy project pace of return would you prefer	1 to 2 years	3 to 4 years	5 to 6 years	7 to 8 years	9 to 10 years

Key:

SR Solar Radiation
HP Hydro Power
BM Biomass
NP Nuclear Power
GT Wind Power

MHQ	Much Higher Quality
HQ	Higher Quality
MQ	Moderate Quality
LQ	Lower Quality
MLQ	Much Lower Quality
VAA	Very Available in Abundant
MAA	Moderately Available in Abundant
SAA	Slightly Available in Abundant
MSA	Moderately Scarcely Available
SA	Scarcely Available