



# The Role of Corporate Financial Strategy in Sustainable Energy Transition: A Systematic Review

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## **Author's contribution**

*The sole author designed, analyzed, interpreted and prepared the manuscript.*

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## **ABSTRACT**

Corporate finance strategies are emerging as major facilitators of the global energy transition as people become more aware of climate change and the need for sustainability. This article investigates the role of corporate finance in aiding the transition from traditional fossil fuels to renewable energy sources. The study examines the use of green financing products such as green bonds and sustainability-linked loans, as well as the influence on corporate investments in sustainable energy. It also looks at the financial risks, cost savings, and profitability of renewable energy projects, as well as the challenges faced by high upfront prices and restricted access to funding in poor countries. A systematic literature review (SLR) was carried out to bring together current research on corporate finance strategies, sustainable energy transitions, and associated financial innovations. The findings show that, while green financing solutions provide critical capital for renewable energy projects and boost business reputation, major hurdles persist, particularly in emerging nations. The report concludes with recommendations for increasing access to green financing, improving risk management measures, and promoting public-private partnerships to

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hasten the worldwide transition to sustainable energy. Businesses may improve their sustainability while still ensuring long-term economic development and stability in an increasingly carbon-conscious society.

*Keywords: Sustainable energy transition; financial innovation; green bonds; corporate finance strategies.*

## 1. INTRODUCTION

In the present day of climate consciousness, the search for sustainable energy sources is not just an environmental responsibility but also a strategic business decision. Corporate finance strategies play an important part in this transformation, providing a link between existing energy practices and a more sustainable future [1]. As firms around the world face increasing demand from customers, governments, and investors to reduce their carbon footprints, financial strategies to promote sustainable energy must evolve.

This article looks at the many roles that corporate finance strategies play in the energy transition. Green bonds and sustainability-linked loans, specifically designed to support projects with positive environmental or climatic impacts, are becoming increasingly popular among companies [2]. These instruments not only offer the funding required to launch large-scale renewable projects, but they incorporate corporate finance with larger sustainability objectives [2]. Investment patterns also point to a considerable move toward renewable energy sources, driven by both the lower cost of renewable technologies and the rising financial feasibility of these investments [3]. According to research, renewable energy projects currently provide comparable, if not greater, returns to typical fossil fuel investments [4]. This economic incentive is critical for businesses seeking to switch to renewable energy while retaining profitability and shareholder value.

The economic consequences of switching to renewable energy are significant. Companies that invest in renewable energy resources can profit from increased energy security and price stability, as opposed to the volatility commonly associated with fossil fuel markets [5]. Furthermore, the regulatory environment is becoming more friendly to sustainable practices, with many countries providing tax breaks and subsidies to encourage renewable energy use [6].

Corporate strategies are also adapting to climate change threats. Financial plans now include risk assessments that consider the possible effects of climate change on operations and investments [7]. This proactive strategy assists businesses in mitigating the risks associated with carbon-intensive assets, which are expected to lose value as global emissions policies tighten [8]. Furthermore, firms understand the importance of transparency in their financial plans, as stakeholders want more information about how investments align with sustainability goals. Adelekan et al. [9] for example, noted the implementation of reporting systems and guidelines, such as the Task Force on Climate-related Financial Disclosures (TCFD), to increase transparency of financial repercussions associated with climate risks and opportunities.

### 1.1 Research Objectives

- To evaluate the impact of green financing instruments (e.g., green bonds, sustainability-linked loans) on corporate investments in renewable energy.
- To analyse the financial risks associated with renewable energy projects and explore risk management strategies employed by corporations.
- To identify the challenges faced by businesses, particularly in developing countries, in accessing capital for renewable energy initiatives and propose solutions to improve access.

### 1.2 Significance of the Study

This study is crucial because it discusses the urgent need for corporations to align their financial strategy with global environmental goals. This study provides a framework for improving both environmental outcomes and corporate profitability by investigating how organisations might incorporate green finance while overcoming financial constraints. The findings are significant for governments, business leaders, and investors, especially in emerging nations where financial limitations and

high initial costs are more prevalent. Furthermore, the study's focus on financial innovations and risk management measures emphasises the significance of long-term planning and adaptation in a quickly changing energy market.

## 2. LITERATURE REVIEW

In response to global environmental and business constraints, integrating financial strategy with sustainable energy transition has emerged as an important research topic. This paper conducted critical literature reviews of the roles corporate financial strategies play in promoting sustainable energy initiatives, with emphasis on capital structure, investment strategies, financial innovation, and risk management. It also investigates the obstacles and possibilities associated with the shift from traditional to renewable energy sources, taking into account regulatory, market, and technological factors that impact financial decisions.

### 2.1 Corporate Financial Strategy and Its Key Components

Corporate financial strategy is the process of effectively managing financial resources to meet long-term corporate goals while maintaining profitability and growth. Capital structure, investment strategy, dividend policy, and risk management are all important factors to consider. The company's cost of capital and risk profile influence capital structure decisions, such as the balance between debt and equity financing [10]. Investment strategies prioritise initiatives that correspond with corporate objectives, as measured by measures such as net present value (NPV) and internal rate of return (IRR) [10]. Dividend policy directs the distribution of earnings, whereas efficient risk management protects the long-term stability of business assets [10,11].

In today's business, connecting financial strategy with sustainability goals is crucial for managing stakeholder expectations and improving corporate reputation. Meo and Abd Karim [12] emphasise the importance of green finance tools, such as green bonds, in supporting environmentally beneficial initiatives. Integrating sustainability into corporate finance reduces environmental risks, attracts eco-conscious

investors, and improves long-term financial and environmental performance [12].

### 2.2 The Need for Sustainable Energy Transition and Financial Challenges

The global dependence on fossil fuels has caused substantial environmental harm, requiring the development of renewable energy sources such as solar, wind, and hydropower. The combustion of fossil fuels is responsible for a significant amount of global CO<sub>2</sub> emissions, which contribute to climate change and extreme weather occurrences [13]. As major energy consumers, companies face the challenge of transitioning to sustainable energy, which requires significant investment in renewable technology. According to Lv [14], firms can lead the change by investing in renewable technology and increasing energy efficiency. However, substantial initial expenses for infrastructure, ongoing maintenance, and technical updates provide considerable financial impediments, particularly for low- and middle-income countries [14].

Financial concerns, such as technological obsolescence and market instability, impede the shift to clean energy. Temmes et al. [15] argue that unpredictability in energy costs and conflicting government policies impede investment in renewable energy. Saleh and Hassan [16] emphasise the need for solid financial frameworks and public-private partnerships to reduce investment risks and increase access to funding for renewable energy projects. Government incentives, subsidies, and financial instruments are critical for overcoming these obstacles and facilitating the transition to sustainable energy [16].

### 2.3 Opportunities for Corporations in the Sustainable Energy Transition

By implementing sustainable energy practices, businesses can save money in the long run while also creating new revenue sources. Investing in renewable energy, such as solar and wind, can lower operating costs while protecting businesses from the unpredictability of fossil fuel prices [14]. As the cost of renewable technology falls, businesses that invest early will benefit from more affordable energy costs and more predictable consumption patterns.

Furthermore, the switch to renewable energy creates new business prospects. Companies can profit from their investments in renewable technology by providing solutions to other firms or consumers, such as selling excess energy back to the grid or producing energy-efficient goods and services [16]. Okoli [17] adds that companies that emphasise sustainability improve their brand reputation and acquire a competitive advantage in the marketplace, attracting environmentally concerned consumers and investors.

Green financing also helps corporations fund renewable energy initiatives. Green bonds and sustainability-linked loans offer more appealing financing terms than conventional options, increasing access to financial availability/capital [13]. Isah et al. [18] showed how government incentives, such as concessional loans and guarantees, can boost private sector investment in renewable energy by reducing financial risks.

#### **2.4 Strategic Financial Decisions to Facilitate Energy Transition**

Capital budgeting is critical for allocating cash towards renewable energy initiatives. Companies employ NPV and IRR to assess the financial and environmental benefits of renewable energy investments, making them more feasible [1]. Diversifying investment portfolios to incorporate sustainable energy assets mitigates the risks associated with fossil fuel reliance while also aligning with global environmental trends [19].

Long-term power purchase agreements (PPAs) and financial derivatives are two risk management methods that firms use to hedge against price volatility and market variations in the renewable energy sector [20]. Furthermore, government subsidies, tax breaks, and grants considerably lessen the financial barriers to renewable energy investments, making them more appealing to businesses [18]. Corporate restructuring, which involves mergers and acquisitions, is also a strategic way to align corporate operations with sustainability objectives. Companies can improve their market position and demonstrate commitment to sustainability by divesting from fossil fuels and acquiring renewable energy assets [21].

#### **2.5 The Role of Financial Innovation in Supporting Sustainable Energy Transition**

Financial innovation is critical in accelerating the transition to renewable energy by providing the funding and risk management tools required to fund large-scale projects. Historically, financial innovations have aided energy transitions, such as the transition to steam power and electricity production [22]. Green bonds and carbon credits are two new financial instruments that provide funding for sustainable activities [23].

Digital finance is also emerging as a valuable tool for encouraging green innovation by increasing financial inclusion and facilitating funding flows for renewable energy initiatives. In developing nations, digital platforms can provide a more inclusive approach to financing the energy transition, overcoming the restrictions of traditional financial services [24]. Pathania and Bose [22] differentiate between system-dependent and system-independent financial innovations. The first requires institutional reforms to facilitate large-scale energy shifts, whereas the latter allows for more adaptable, individual-driven solutions. Both methods are critical for increasing renewable energy projects' financial viability and attracting investment.

#### **2.6 Theoretical Framework**

The theoretical framework for this study will integrate corporate financial strategy theories and sustainability transition models, with a focus on how financial decisions can influence corporate sustainability goals and energy transitions.

##### **2.6.1 Corporate financial strategy theory**

**Capital Structure Theory:** This theory suggests that the mix of debt and equity financing influences a firm's cost of capital and investment decisions [25]. Relating this to sustainable energy transitions, companies might leverage green bonds and sustainability-linked loans as innovative financing tools to reduce the cost of capital and fund large-scale renewable energy projects. The applicability of this theory can be seen in the firm's ability to balance its capital structure while integrating green finance tools,

which can directly affect its sustainability investments.

**Risk Management Theory:** This theory posits that managing financial risks is essential for business stability [26]. In energy transitions, companies must protect against market volatility (e.g., fluctuating fossil fuel prices) using instruments such as long-term power purchase agreements (PPAs) and financial derivatives. Firms utilising effective risk management tools can stabilise energy costs and attract investors seeking sustainable profits.

### 2.6.2 Sustainability and Corporate Social Responsibility (CSR) theory

**Triple Bottom Line Theory (TBL):** This theory emphasises that companies should focus on three key areas—people, planet, and profit [27]. Financial strategies aimed at fostering renewable energy align with the “planet” aspect, demonstrating corporate responsibility toward environmental sustainability. Companies adopting TBL by investing in renewable energy could potentially enhance their brand reputation, attract eco-conscious consumers, and achieve long-term profitability.

**Corporate Social Responsibility (CSR):** CSR theory suggests that businesses have obligations beyond profit maximisation, including environmental stewardship [28]. By integrating CSR into financial strategy, firms can leverage financial innovations to fund sustainable projects, improving both financial performance and public perception. Companies that prioritise CSR in their financial planning are better positioned to gain competitive advantages through eco-friendly investments.

### 2.6.3 Energy transition theory

**Sustainable Energy Transition Model:** This model describes the shift from fossil fuels to renewable energy as a multi-level process influenced by technological innovations, policy changes, and market forces [29]. Corporate finance strategies are critical in facilitating this transition by providing the necessary capital and managing the financial risks associated with renewable energy investments. Financial innovation, such as the use of digital platforms for green finance, is crucial for enhancing financial inclusion and supporting renewable

energy projects, especially in developing countries.

**Innovation Diffusion Theory:** This theory explains how new ideas, such as renewable energy technologies and green financing tools, are adopted over time within industries [30]. Companies that adopt financial innovations early, such as carbon credits and sustainability-linked loans, can secure competitive advantages and lower the barriers to entry for others. Early adopters of green finance tools are more likely to succeed in the long-term by securing investments for clean energy initiatives.

## 3. METHODOLOGY

This study used a systematic literature review (SLR) methodology to investigate the role of corporate financial strategies in the transition to sustainable energy. This method was chosen for its comprehensive and systematic nature, which ensures an extensive analysis of current material while providing an unbiased understanding of the issue. SLR's methodological rigour is especially effective for synthesising complicated topics such as the integration of financial strategies with sustainability energy transition, as it allows the inclusion of diverse study designs and methodologies like qualitative and quantitative research (Okoli, 2015).

The initial phase entailed developing particular research questions to better understand the role of corporate finance strategy in supporting the transition to sustainable energy. To guarantee the relevance and quality of the research analysed, inclusion and exclusion criteria were devised [31]. A detailed screening of relevant research was then conducted, with an emphasis on quality, methodology, and findings. The chosen studies were then subjected to data extraction, in which crucial information on corporate financial strategies, sustainable energy transition, and challenges was gathered and carefully analysed to identify common themes and gaps in the current literature.

This review looked at studies with high levels of evidence. This guarantees that the synthesised data originates from studies that rank highly in the evidence hierarchy scale [32]. Although SLRs can be time-consuming, they provide a complete aggregate of current information, ensuring the inclusion of diverse views (Okoli, 2015). This

study favoured the use of SLR due to its ability to provide a comprehensive assessment of financial strategies for sustainable energy transition, minimise bias, and ensure a fair understanding of the subject [33].

### 3.1 Database

An exhaustive search approach was carried out across numerous academic databases and professional platforms, including Elsevier, MDPI, Researchgate and Sage Publications. This method provided a comprehensive capture of relevant published and unpublished research, eliminating publication bias [34]. The databases gave access to peer-reviewed, high-quality articles, increasing the legitimacy of the sources consulted. The incorporation of multiple ideas from interdisciplinary sources was critical to understanding the connection between financial strategy and sustainability in the energy transition.

### 3.2 Keywords and Search Terms

A variety of keywords and search terms were strategically employed to cover the breadth of corporate financial strategies in sustainable

energy transition. Boolean operators were used to optimise the search process: "AND" narrowed the search by combining keywords, ensuring that all retrieved articles contained the specified terms, and "OR" broadened the search to include articles with any listed keywords, capturing a broader scope of literature.

### 3.3 Inclusion and Exclusion Criteria

The inclusion and exclusion criteria were carefully put together to narrow and focus the research scope, comparable to the methods mentioned by Butler et al. (2016). The included research required a direct examination of corporate finance strategies within the framework of sustainable energy transitions. It had to focus on new financial ideas, such as green bonds, loans linked to sustainability, and risk management techniques.

### 3.4 Study Selection

A thorough two-stage screening methodology was used to identify the studies. Initially, titles and abstracts were examined to exclude papers

**Table 1. Keyword combinations and boolean operators forming search terms**

Keyword	Boolean	Keyword	Boolean	Keyword
Financial Strategy	OR	Sustainable	AND	Green Bonds
Corporate Finance	AND	Sustainability Investments	OR	Energy Transition
Risk Management	OR	Renewable Energy	AND	Sustainability-linked Loans
Corporate Financial Planning	AND	Environmental Responsibility	OR	Financial Innovations

**Table 2. Inclusion and exclusion criteria for the study on corporate financial strategy and sustainable energy transition**

Inclusion Criteria	Exclusion Criteria
Studies focusing on corporate financial strategies in sustainable energy transition.	Studies not specifically address corporate financial strategies.
Research emphasising sustainability in corporate finance.	Studies lacking sustainability focus on financial strategies.
Studies that evaluate the impact of financial innovations (e.g., green bonds).	Research unrelated to sustainable energy or financial innovation.
Articles published in English.	Non-English publications.
Studies published between 2011 and 2024 to ensure contemporary relevance.	Research published before 2011.

Source: Author's Construct (2024)

that did not satisfy the established inclusion criteria. A full-text assessment was performed on the remaining papers to ensure their relevance and quality in accordance with the inclusion criteria [35]. The strict selection process ensured the inclusion of only high-quality studies directly related to corporate financial strategies and sustainable energy transitions. This made it possible to do a more focused review of the relevant literature [36].

#### **4. DATA ANALYSIS**

Data analysis included both descriptive statistics and thematic analysis. Descriptive statistics was used to summarise research characteristics and outcomes, making comparisons easier [37]. The thematic analysis delves further into qualitative features, identifying major patterns and themes in the data to provide a comprehensive picture of how corporate finance strategies influence sustainable energy transitions [38]. This dual strategy ensured a rigorous and detailed study of the data, which increased the depth of the research findings.

##### **4.1 Results**

The study focuses on many crucial aspects concerning the role of corporate finance strategies in driving the transition to sustainable energy. These themes highlight the need for implementing green financing resources, controlling financial risks, and overcoming barriers to accessing capital for renewable energy projects. Furthermore, the report highlights how investment in sustainable energy may result in cost savings, increased profitability, and a better business reputation. Table 3 summarises the important concepts and their explanations.

##### **4.2 Discussion of Findings**

This study's findings show that corporate finance strategies play an important role in aiding the transition to sustainable energy, which is consistent with the general literature on the subject. The use of green finance instruments, such as green bonds and sustainability-linked loans, was identified as a critical facilitator of renewable energy projects. This is consistent with Meo and Abd Karim's [12] research, which emphasised the role of green financing in lowering CO<sub>2</sub> emissions and encouraging

ecologically beneficial initiatives. While these financial instruments are becoming more popular, there are still limitations to guaranteeing widespread use, particularly in places with underdeveloped financial markets [16]. This demonstrates that although green finance effectively promotes sustainability, there is still a need to expand its availability across various sectors and industries.

Risk management has also emerged as an important consideration in the shift to renewable energy. Long-term power purchase agreements (PPAs) and hedging techniques assist businesses in mitigating the financial risks associated with energy price volatility, as found by Egli et al. [20]. This type of risk management not only keeps energy costs stable, but also attracts investors looking for consistent profits in the renewable energy sector [19]. Despite its success, this technique faces criticism for its reliance on long-term contracts, which could limit flexibility in rapidly evolving energy markets. Furthermore, smaller businesses may lack the capacity to implement comprehensive risk management measures, restricting their involvement in the sustainable energy transition.

Other major findings included cost reductions, profitability, and long-term financial benefits from renewable energy expenditures. Lv [14] found that organisations utilising solar and wind energy experience significant cost reductions due to the minimal operational expenses associated with these energy sources once the infrastructure is in place. However, this result is more relevant to developed markets, where renewable energy infrastructure is more inexpensive due to technology developments and government subsidies. In contrast, Saleh and Hassan [16] said that high initial expenditures continue to be a significant obstacle for firms in poor countries where financial resources are sparse. This gap demonstrates the unequal pace of the global energy transition and the need for financial innovations suited to emerging economies. As noted by Khellaf [41] this gap can improved upon by collaborations and innovation between corporations from two different geographical regions, where by sharing knowledge and ideas can significantly improve the advancement of technology and financial planning, thereby providing strategic solutions for energy challenges in both regions.

**Table 3. The included studies and the study characteristics**

S/N	Database	Journal	Author and year	Title	Keyword	Methodology	Strength	Limitations
1	McGraw Hill	Book	Hillier, D., Grinblatt, M., Titman, S. (2011)	Financial Markets and Corporate Strategy	Financial markets, corporate strategy	Descriptive and analytical approach	Comprehensive coverage of financial strategies and renewable energy	Focused on European markets, limited applicability elsewhere
2	Elsevier	Borsa_Istanbul Review	Meo, M.S. and Abd Karim, M.Z. (2022).	The Role of Green Finance in Reducing CO2 Emissions: An Empirical Analysis	Green finance, CO2 emissions	Qualitative analysis	Provides a thorough empirical analysis of green finance on CO2 emissions	Limited to 10 top economies, results may not be generalisable
3	Researchgate	Applied Chemical Engineering	Saleh, H. M. and Hassan, A. I. (2024)	The challenges of sustainable energy transition: A focus on renewable energy	Sustainable energy, renewable energy, climate change	Review article with extensive literature analysis	Comprehensive analysis of renewable energy technologies and policy frameworks	High initial costs and intermittency of renewable energy sources not fully addressed
4	Frontiers	Frontiers in Energy Research	Lv, Y. (2023).	Transitioning to sustainable energy: opportunities, challenges, and the potential of blockchain technology	Sustainable energy, blockchain, renewable energy technologies	Qualitative research, extensive literature review	Comprehensive overview of challenges, opportunities, and blockchain potential in sustainable energy	High upfront costs and policy resistance to sustainable energy adoption
5	ScienceDirect	Journal of Cleaner Production	Temmes, A., Heiskanen, E., Matschoss, K. and Lovio, R. (2021).	Mobilising mainstream finance for a future clean energy transition: The case of Finland	Finance, Energy transition, Technological innovation, Market formation, Resource mobilisation	Case study analysis using Technological Innovation Systems (TIS) framework	Offers insight into the barriers and enablers of financing clean energy and highlights the interdependency between different TISs	Limited to the Finnish context, not easily generalisable to other regions or sectors
6	BMC	Energy, Sustainability and Society	Isah et al. (2023)	Financing renewable energy: policy insights from Brazil & Nigeria	Renewable energy finance, Energy policy	Mixed-methods research design, including quantitative analysis, unstructured interviews, and extensive literature review.	Provides comprehensive analysis of RE financing in two key economies, with policy recommendations for Nigeria.	Limited to Brazil and Nigeria; relies heavily on qualitative interviews.
7	Springer	Book	Hafner, M. and Tagliapietra, S. (2020)	The Geopolitics of the Global Energy Transition	Energy Transition, Renewable	Review of existing literature on global energy transition	Provides comprehensive geopolitical analysis of energy transition	Only existing literature; lacks empirical case studies



Energy								
8	Researchgate	International Journal of Science and Research Archive	Okoli et al. (2024)	Sustainable energy transition strategies: A comparative review of CSR and corporate advising in the petroleum industry in the United States and Africa	Sustainable energy, petroleum, CSR.	Comparative analysis of CSR initiatives in US and Africa	Provides a comparative analysis across two regions with different economic and regulatory frameworks	Focuses mainly on the petroleum industry, with limited application to other industries or renewable sectors
9	Elsevier	Energy Reports	Qadir et al. (2021)	Incentives and strategies for financing renewable energy transition: A review	Renewable energy, barriers, incentives, strategies	Systematic literature review of RE transition strategies and financing	Comprehensive review of financial incentives and strategies	Focuses on specific geographical regions, may lack global generalisation
10	IOPscience	Environmental Research Letters	Egli et al. (2022)	Financing the energy transition: four insights and avenues for future research	Energy transition, cost of capital, green finance	Mixed-methods approach	Offers comprehensive insights into energy finance dynamics and future research directions.	Focuses primarily on Europe, with limited global application
11	Springer	Book	Van de Putte et al. (2020)	Financing the Sustainable Energy Transition	Sustainable energy, Financing, Circular Economy	Literature review.	Comprehensive analysis of capital markets and renewable energy financing strategies	Focuses mainly on developing countries, may not fully cover global implications
12	World Bank group	Policy Research Working Paper	Calice and Demekas (2024)	Just Transition: Issues for Central Banks and Financial Regulators	just transition; financial stability, financial regulation, climate change.	Policy review and analysis.	Highlights the need for regulation and fair practices in financial sector transitions	Conceptual, with limited data on real-world implementation
13	Researchgate	Computer Science & IT Research Journal	Olanrewaju et al. (2024) [39]	Driving Energy Transition Through Financial Innovation: The Critical Role of Big Data and ESG Metrics	Energy transition, Financial innovation, ESG, Big Data	Case study and literature review	Highlights the synergy between Big Data and ESG metrics in advancing sustainable investments	Limited to case studies.
14	Researchgate	Marketing and Management of Innovations	Strielkowski (2024)	Innovations in the Energy Sector as a Powerful Catalyst for Financial Transformations	Energy innovations, renewable energy, green finance, financial	Bibliometric network analysis using VOSviewer software	Comprehensive overview of the interplay between energy transitions and financial innovations	Focuses heavily on academic trends, lacks in-depth analysis of real-world applications

					innovations			
15	Taylor & Francis	Journal of Sustainable Finance & Investment	Pathania and Bose. (2014)	An Analysis of the Role of Finance in Energy Transitions	Finance, Energy Transitions, Innovation	Historical and narrative analysis	A comprehensive review of financial innovations across energy transitions.	Limited empirical data, focuses on historical narrative.
16	ScienceDirect	Energy Economics	Hossain et al. (2024).	Empowering energy transition: Green innovation, digital finance, and the path to sustainable prosperity through green finance initiatives	Digitisation Economics Energy Green finance Innovation Sustainability	Quantitative	Highlights the role of digital finance in boosting green innovation across different countries.	
17	Elsevier	Energy	Wang et al., (2023) [40]	Optimal energy management of integrated energy systems for strategic participation in competitive electricity markets.	Competitive electricity markets, IES, day-ahead bidding, CVaR, MPC, energy management	Quantitative	Effectively manages risk aversion toward market uncertainties, tested through case studies in PJM and Guangdong electricity markets	The proposed framework may be complex to implement due to the high level of uncertainties in real-time market predictions and operations
18	Springer	Africa-EU Renewable Energy Research and Innovation Symposium (RERIS 2018).	Khellaf (2018)	Overview of Economic Viability and Social Impact of Renewable Energy Deployment in Africa.	Renewable energy, Africa, EU, energy systems, innovation.	Theoretical discussions and case studies.	Comprehensive exploration of renewable energy projects in Africa and Europe; the research focuses on practical applications and collaboration opportunities.	Limited to specific regions; findings may not be applicable to all global contexts or nations.

Source: Author's Construct (2024)

**Table 4. Summary of the Result**

<b>Theme</b>	<b>Explanation</b>	<b>References</b>
Adoption of Green Finance Instruments	Corporate financial strategies are increasingly including green finance solutions like green bonds and sustainability-linked loans. These options improve firms' financing choices and enable them to fund sustainable energy projects more effectively.	Meo and Abd Karim [12]; Hafner and Tagliapietra [13]
Risk Management in Renewable Energy	Managing financial risks is critical in renewable energy initiatives. Companies that employed hedging methods and long-term power purchase agreements (PPAs) were better prepared to deal with market changes, particularly in fossil fuel pricing.	Egli et al. [20]; Calice and Demekas [19]; Wang et al., [40]
Cost Savings and Profitability	Investment in renewable sources of energy such as solar and wind resulted in considerable cost reductions. Once built, these energy sources protected against the volatility of fossil fuel prices while also resulting in long-term profitability.	Lv [14]
Challenges in Access to Capital	The high upfront costs of renewable energy infrastructure, particularly in poor countries with limited access to capital, provide a substantial impediment to sustainable energy transitions.	Saleh and Hassan [16]; Temmes et al. [15]
Enhancing Corporate Reputation	Companies that include sustainability into their financial plans improve their brand reputation, attract eco-conscious investors and consumers, and gain a competitive market edge.	Okoli (2024)
Collaboration in Renewable Energy	Collaborative research and innovation between Africa and the EU in renewable energy have significantly improved advancements in technology and financial planning, thereby providing strategic solutions for energy challenges in both regions.	Khellaf [41]

*Source: Researcher's Construct (2024)*

One of the study's most striking findings is the improved business reputation that results from integrating financial strategy with sustainability objectives. Okoli [17] illustrated how enterprises recognised for their dedication to renewable energy attract more consumers and investors, giving them a competitive advantage in their sectors. This discovery is consistent with larger trends in corporate social responsibility (CSR) and environmental, social, and governance (ESG) frameworks, which are growing more relevant to stakeholders. While reputation enhancement is a powerful motivator, some

critics argue that focusing too much on brand image can lead to "greenwashing," in which companies exaggerate their sustainability efforts in order to appear environmentally friendly without making significant contributions to sustainability [15]. While the findings of this study are consistent with previous research on corporate financial strategy and energy transition, they also highlight some significant obstacles and limitations. The accessibility of green finance, the difficulties of risk management, and the high initial costs of

renewable energy infrastructure require more attention.

## 5. CONCLUSION

The study demonstrates how business financial strategies facilitate the global shift towards sustainable energy. Key findings show that collaboration of resources and green financing mechanisms like green bonds and sustainability-linked loans are essential for funding renewable energy projects, cost saving and increasing profitability. However, high initial costs, restricted cash availability in poor nations, and market volatility disrupt a seamless transition. Risk management solutions like power purchase agreements (PPAs) have proven effective but may limit flexibility in changing energy markets. Integrating sustainability into company finance boosts image and attracts eco-conscious investors, yet "greenwashing" issues remain. Despite visible progress, we must address financial and physical hurdles, particularly in emerging economies.

## 6. RECOMMENDATIONS

- 1. Expansion of Green Financing:** The government of developing nations should encourage green finance mechanisms like green bonds and sustainability-linked loans. This will reduce initial costs and encourage private renewable energy investments, tax incentives and subsidies should be included.
- 2. Enhanced Public-Private Partnerships:** There should be a focus on developing relationships between the public and commercial sectors. Governments can play an important role in de-risking renewable energy investments, particularly in high-risk sectors, by offering guarantees and concessional loans.
- 3. Diversified Risk Management Strategies:** To mitigate energy price volatility, corporations must use flexible risk management approaches such as power purchase agreements (PPAs) in conjunction with novel financial derivatives. Smaller enterprises require tailored solutions to secure their participation in the energy transformation.
- 4. Boosting Technological Investments in Developing Countries:** Financial innovations must try to address outdated technology and high infrastructure costs in

emerging countries. International financial institutions can help by providing concessional funding and technology sharing programs.

- 5. Encouraging Transparency and Reporting Standards:** Corporations should be encouraged to use global reporting standards like the Task Force on Climate-related Financial Disclosures (TCFD) to increase transparency and boost stakeholder confidence. This will not only boost reputation but also attract more environmentally conscious investors.

## DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

## COMPETING INTERESTS

Author has declared that they have no known competing financial interests or non-financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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