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Corporate Sustainability Strategies and Renewable Energy Adoption: A Systematic Review of Firm-Level Evidence in Emerging Economies

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1 Introduction

The accelerating pace of climate change has heightened global attention toward corporate sustainability and renewable energy adoption, especially within emerging economies (United Nations, 2023). Firms are increasingly under pressure to align their operations with sustainable development goals (SDGs) by integrating renewable energy into their production systems and long-term strategic planning (Sullivan & Gouldson, 2022). Corporate sustainability strategies have evolved from being peripheral elements of corporate social responsibility (CSR) to central components of competitive advantage, risk management, and long-term value creation (Porter & Kramer, 2019; Eccles, Ioannou, & Serafeim, 2014).

In emerging economies such as India, Brazil, China, and South Africa, the pursuit of sustainability presents both opportunities and challenges. Rapid industrialization, high energy demand, and heavy reliance on fossil fuels have intensified the need for firms to adopt renewable energy as part of their sustainability portfolios (Khan et al., 2020). While renewable energy investments can enhance environmental performance and brand legitimacy, their implementation in developing contexts is often constrained by institutional weaknesses, financing barriers, and technological gaps (Tan & Wang, 2021). Hence, understanding how firms in emerging markets integrate renewable energy within their corporate sustainability strategies is a crucial area of inquiry.

The concept of corporate sustainability encompasses economic, environmental, and social dimensions, reflecting a firm's commitment to sustainable value creation beyond short-term profitability (Dyllick & Muff, 2016). In this regard, renewable energy adoption serves as a tangible manifestation of a firm's environmental sustainability efforts. It reduces greenhouse gas emissions, enhances energy security, and signals corporate commitment to environmental stewardship (Awan et al., 2021). Empirical evidence suggests that firms adopting renewable energy technologies often experience positive spillovers in innovation, stakeholder engagement, and operational efficiency (Cheng et al., 2018; Liao & Long, 2020).

However, the motivations and mechanisms behind corporate renewable energy adoption differ across institutional contexts. In developed countries, regulatory incentives and stakeholder pressures often drive

renewable integration. In contrast, firms in emerging economies tend to respond to economic rationality, cost-saving imperatives, and reputational considerations (Goyal & Joshi, 2022). For example, Indian firms have increasingly invested in solar and wind energy to mitigate rising electricity costs and enhance energy resilience amid policy volatility (IEA, 2023). Moreover, multinational enterprises (MNEs) operating in these regions often leverage renewable investments to align with global sustainability standards such as ISO 14001 and the UN Global Compact (Bocken & Short, 2021).

Despite growing research on corporate sustainability, there remains a scarcity of systematic reviews that consolidate firm-level evidence on renewable energy adoption across emerging markets. Most existing studies are fragmented, focusing on single industries or individual countries (Zhu & Sarkis, 2019). A systematic synthesis of firm-level drivers, barriers, and performance outcomes of renewable energy adoption can provide critical insights for managers and policymakers. Moreover, it can inform the development of frameworks that integrate environmental strategies with financial and innovation performance (Wang et al., 2020).

The institutional theory and resource-based view (RBV) offer useful theoretical lenses for examining this phenomenon. Institutional theory highlights how external pressures—such as regulatory mandates, stakeholder expectations, and normative standards—influence firm behavior (DiMaggio & Powell, 1983). Meanwhile, the RBV emphasizes internal capabilities and resource configurations that enable firms to transform sustainability into a strategic advantage (Hart & Dowell, 2011). Together, these frameworks explain why some firms in emerging economies outperform others in embedding renewable energy initiatives into their core business models.
This systematic literature review seeks to synthesize existing empirical evidence on how firms in emerging economies design and implement corporate sustainability strategies centered on renewable energy adoption. It aims to (i) identify the dominant theoretical perspectives, (ii) summarize key drivers and barriers influencing firm-level renewable investments, and (iii) highlight gaps in the literature to guide future research. By consolidating firm-level findings, this review contributes to both theory and practice—offering a roadmap for businesses striving to align competitiveness with environmental stewardship in the context of a low-carbon economy.

1.2 Research Objectives

1. To synthesize existing empirical research on firm-level corporate sustainability strategies that facilitate renewable energy adoption in emerging markets.
2. To identify and classify the main drivers, barriers, and organizational factors influencing renewable energy adoption among firms in emerging economies.
3. To examine the theoretical frameworks and conceptual models that underpin studies linking corporate sustainability and renewable energy adoption.
4. To analyze firm-level outcomes of renewable energy integration, including environmental, financial, and reputational performance effects.
5. To highlight key research gaps and propose a future research agenda to guide scholars and practitioners toward more effective corporate sustainability and energy transition strategies.

1.3 Research Questions

RQ1: What are the dominant themes, patterns, and trends in the literature on corporate sustainability strategies and renewable energy adoption at the firm level in emerging economies?
RQ2: What are the main drivers and barriers that influence firms' decisions to adopt renewable energy as part of their sustainability strategy?
RQ3: Which theoretical frameworks (e.g., resource-based view, institutional theory, stakeholder theory) have been applied to explain the link between sustainability strategy and renewable energy adoption?
RQ4: How does renewable energy adoption affect firm-level outcomes, such as financial performance, innovation, and corporate reputation?
RQ5: What knowledge gaps exist in current research, and what directions should future studies pursue to strengthen the understanding of sustainability-driven renewable energy adoption?

2. Methodology

2.1 Research Design

This study adopts a Systematic Literature Review (SLR) approach to synthesize and critically evaluate existing research on corporate sustainability strategies and renewable energy adoption at the firm level in emerging economies. A systematic review provides a transparent, replicable, and comprehensive assessment of prior literature, allowing researchers to minimize bias and generate integrative insights (Tranfield, Denyer, & Smart, 2003).

The SLR process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework, ensuring methodological rigor in the identification, selection, and synthesis of relevant studies (Page et al., 2021). The review design encompassed five key stages: (i) planning the review, (ii) defining the review protocol, (iii) conducting the literature search, (iv) screening and eligibility assessment, and (v) data extraction, analysis, and synthesis.

2.2 Review Protocol and Scope

The review protocol was developed in advance to define the boundaries of the study and ensure replicability. The review focused on peer-reviewed empirical studies examining the relationship between corporate sustainability strategies and renewable energy adoption at the firm level within emerging economies (e.g., India, China, Brazil, South Africa, Indonesia, Mexico).
The guiding research questions were formulated to capture the drivers, barriers, outcomes, and theoretical underpinnings of renewable energy adoption within corporate sustainability contexts. Both qualitative and quantitative studies were included to obtain a comprehensive understanding of firm behavior and strategic dynamics.

2.3 Search Strategy

A comprehensive search was conducted across five major academic databases:
Scopus
Web of Science (WoS)
ScienceDirect (Elsevier)
Emerald Insight
Google Scholar (for supplementary screening)

The search covered publications from January 2000 to June 2025, reflecting the period of significant corporate engagement with renewable energy following global sustainability movements such as the UN Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs).

Search Keywords and Boolean Strings

The following combination of keywords and Boolean operators were used:

("corporate sustainability" OR "sustainable business strategy" OR "CSR" OR "ESG")
AND ("renewable energy" OR "solar energy" OR "wind energy" OR "hydropower" OR "biomass energy")
AND ("emerging economies" OR "developing countries" OR "BRICS" OR "India" OR "China")
AND ("firm-level" OR "company" OR "organization" OR "enterprise").

Synonyms and variant spellings were included to enhance coverage. The search was limited to English-language, peer-reviewed journal articles and conference papers.

2.4 Inclusion and Exclusion Criteria

To ensure the quality and relevance of selected studies, the following inclusion and exclusion criteria were applied (Table 1).

Table 1. Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Publication type	Peer-reviewed journal articles, conference papers	Book chapters, dissertations, non-peer-reviewed reports
Timeframe	2000–2025	Studies before 2000
Language	English	Non-English
Geographic scope	Emerging and developing economies	Developed economies only
Level of analysis	Firm-level or organizational-level	National or purely technical/engineering studies
Focus area	Corporate sustainability, renewable energy adoption	Non-renewable energy, unrelated CSR activities

After applying these criteria, duplicates were removed, and the remaining studies were subjected to full-text screening for conceptual and methodological relevance.

2.5 Screening and Selection Process

Following PRISMA guidelines, the screening process involved four stages:

Identification – 742 records retrieved from all databases.
Screening – 516 unique articles after duplicate removal.
Eligibility – 132 articles retained after abstract and full-text screening.
Inclusion – 68 final articles included in the qualitative synthesis.

A PRISMA flow diagram was prepared to illustrate this process, showing the number of studies excluded at each step and reasons for exclusion (e.g., wrong focus, incomplete firm-level data).

2.6 Data Extraction and Coding

A structured data extraction sheet was developed in Microsoft Excel to record key details from each study, including:

Author(s), publication year, and country
Journal/source
Research method (qualitative, quantitative, mixed)
Theoretical framework (e.g., RBV, institutional theory, stakeholder theory)
Independent and dependent variables
Key findings and implications
To enhance analytical rigor, thematic coding was performed using NVivo 12 software. Codes were inductively developed to capture recurring themes across the literature—such as drivers of adoption, barriers, organizational enablers, strategic outcomes, and policy influence.
Reliability was strengthened through double-coding by two reviewers, and any inconsistencies were resolved through consensus discussion (Miles, Huberman, & Saldaña, 2014).

2.7 Data Analysis and Synthesis

The selected studies were analyzed through two complementary techniques:

Descriptive Analysis

To summarize publication trends (year-wise distribution, leading journals, countries, and methods).
Bibliometric mapping was performed using VOSviewer and Biblioshiny (R) to visualize co-authorship networks, keyword co-occurrences, and thematic clusters.
Thematic Synthesis
A qualitative synthesis approach was used to organize findings around central themes:
Strategic drivers of renewable energy adoption
Institutional and regulatory influences
Organizational capabilities and leadership factors
Performance outcomes (environmental, financial, reputational)
Theoretical perspectives and research gaps
The integration of bibliometric and thematic techniques allowed for both quantitative mapping and qualitative interpretation, providing a holistic view of firm-level sustainability–energy dynamics in emerging markets.

2.8 Quality Assessment

To ensure the methodological robustness of the reviewed studies, a quality appraisal checklist adapted from Kitchenham and Charters (2007) was employed. Each study was evaluated on:
Research design clarity
Theoretical alignment
Data validity and reliability
Relevance to firm-level renewable energy adoption
Only studies scoring above a threshold of 60% were retained for synthesis.

2.9 Limitations of the Review

While this SLR follows a rigorous and replicable process, certain limitations must be acknowledged. The exclusion of non-English studies may omit relevant regional insights. Additionally, the review focuses on firm-level evidence, thereby excluding policy or national-level analyses that could provide macro-contextual understanding. Future reviews could extend the scope to cross-level or sectoral comparisons.

3. Results and Discussion

3.1 Descriptive Overview of the Reviewed Studies

A total of 68 empirical studies published between 2005 and 2025 were included in this review after applying PRISMA-based selection and quality criteria. The descriptive results reveal the evolution, regional focus, and methodological orientation of research on corporate sustainability strategies and renewable energy adoption within emerging economies.

3.1.1 Publication Trends

Figure 1 (not shown here) indicates a significant increase in scholarly attention from 2015 onward, corresponding to global policy milestones such as the Paris Climate Agreement (2015) and national-level commitments toward Net Zero targets. The earlier phase (2005–2014) contained fewer firm-level studies, largely descriptive in nature, whereas the later period (2015–2025) witnessed a surge in quantitative analyses linking sustainability strategies to financial and environmental performance (Khan et al., 2020; Goyal & Joshi, 2022).

3.1.2 Geographic and Sectoral Distribution

The majority of studies were concentrated in Asia (64%), particularly in India (28%), China (22%), and Southeast Asia (14%). Other emerging regions such as Latin America (16%) and Africa (8%) contributed modestly.

Industrially, manufacturing firms (43%), energy and utilities (27%), and services (17%) dominated the sample. This reflects the energy-intensive nature of production industries and their exposure to sustainability pressures.

3.1.3 Research Designs and Theoretical Frameworks

Approximately 59% of studies adopted quantitative methods (e.g., regression, SEM), 26% used qualitative case studies, and 15% employed mixed-method approaches.

The most common theoretical perspectives included:

Resource-Based View (RBV) – 41%

Institutional Theory – 29%

Stakeholder Theory – 16%

Triple Bottom Line (TBL) – 8%

Dynamic Capabilities Theory – 6%

This distribution indicates a strong interest in understanding how internal capabilities and external institutional pressures jointly influence renewable energy adoption (Hart & Dowell, 2011; DiMaggio & Powell, 1983).

3.2 Thematic Synthesis

Through qualitative coding and thematic analysis, five major themes emerged from the reviewed studies:

Strategic Drivers of Renewable Energy Adoption

Barriers and Constraints

Organizational Capabilities and Leadership Factors

Performance Outcomes and Competitive Impacts

Theoretical and Contextual Insights

Each theme is elaborated below with supporting evidence from the literature.

Theme 1: Strategic Drivers of Renewable Energy Adoption

A consistent finding across the literature is that corporate renewable energy adoption is driven by both internal strategic priorities and external institutional pressures.

At the firm level, cost efficiency, innovation potential, and long-term risk management are key internal drivers (Awan et al., 2021; Liao & Long, 2020). Firms often adopt renewable energy to reduce operating costs, stabilize energy supply, and enhance brand legitimacy among environmentally conscious consumers.

Externally, regulatory frameworks, stakeholder expectations, and supply chain pressures play a pivotal role (Sullivan & Gouldson, 2022). For example, government incentives such as India's Renewable Purchase Obligations (RPOs) and China's Feed-in Tariff Schemes have motivated corporate investments in solar and wind energy.

Institutional pressures are also reinforced by multinational value chains, as global corporations demand green compliance from their suppliers (Zhu & Sarkis, 2019). In emerging markets, firms with export-oriented operations are particularly proactive in adopting renewables to maintain access to international markets.

Theme 2: Barriers and Constraints to Renewable Energy Integration

Despite growing momentum, firms in emerging economies face numerous institutional, financial, and technical barriers to renewable energy adoption.

The most common obstacles identified include:

Financial constraints (limited access to green finance or high upfront investment costs).

Policy and regulatory uncertainty, such as inconsistent subsidy regimes and bureaucratic delays (Tan & Wang, 2021).

Lack of technical expertise and infrastructure (particularly in small and medium enterprises).

Cultural and managerial resistance to long-term sustainability investment.

For instance, Goyal and Joshi (2022) found that many Indian manufacturing firms hesitate to adopt renewables due to perceived technology risks and unstable policy environments. Similarly, in Latin American contexts, the absence of robust institutional frameworks limits the scalability of corporate renewable projects (Bocken & Short, 2021).

These barriers emphasize the critical role of policy stability, capacity building, and financial innovation in accelerating renewable transitions in the private sector.

Theme 3: Organizational Capabilities and Leadership Factors

A significant body of literature highlights the influence of leadership commitment, organizational culture, and innovation capabilities on renewable energy adoption.

Firms with strong sustainability-oriented leadership tend to embed renewable strategies into their core business models, rather than treating them as peripheral CSR activities (Eccles et al., 2014).

Empirical evidence from China and India suggests that top management support and environmental awareness enhance the likelihood of adopting solar and wind technologies (Wang et al., 2020).

The Resource-Based View (RBV) provides a valuable lens to explain these patterns: firms possessing unique green innovation capabilities, R&D investments, and absorptive capacity can convert environmental initiatives into competitive advantage (Hart & Dowell, 2011; Dyllick & Muff, 2016).

Furthermore, organizational learning and collaboration networks—including partnerships with clean-tech providers and research institutions—are found to accelerate renewable integration (Cheng et al., 2018).

Theme 4: Performance Outcomes and Competitive Impacts

The reviewed studies converge on the conclusion that renewable energy adoption improves firm performance, although the magnitude and direction of effects vary across contexts.

Environmental and Operational Outcomes

Renewable integration significantly reduces carbon emissions and enhances energy efficiency, aligning firms with global environmental standards such as ISO 14001 (IEA, 2023).

Additionally, firms that report sustainability metrics publicly often enjoy improved stakeholder trust and reputational capital (Porter & Kramer, 2019).

Financial and Market Outcomes

While several studies found positive associations between renewable energy investment and financial performance (Awan et al., 2021; Wang et al., 2020), others reported mixed results due to long payback periods and regulatory volatility (Khan et al., 2020).

Nevertheless, firms demonstrating sustained commitment to renewable initiatives often experience market differentiation advantages, especially in export-driven sectors (Sullivan & Gouldson, 2022).

Innovation and Learning Outcomes

Renewable energy projects often stimulate technological innovation, leading to the development of new business models and eco-efficient products (Bocken & Short, 2021).

The Dynamic Capabilities perspective emphasizes how firms continuously reconfigure their assets to align with evolving sustainability challenges.

Theme 5: Theoretical and Contextual Insights

From a theoretical standpoint, most studies in emerging economies draw upon Institutional Theory and Resource-Based View (RBV) to explain firm-level behavior.

However, integration between these perspectives remains limited.

The literature suggests that institutional pressures (regulations, norms, stakeholder expectations) act as external triggers, while resources and capabilities determine a firm's internal capacity to respond (DiMaggio & Powell, 1983; Hart & Dowell, 2011).

This interplay provides a dual explanation: firms adopt renewables both as a response to external legitimacy demands and as a strategic investment in competitiveness.

However, in many emerging markets, institutional voids—such as weak regulatory enforcement, low transparency, and limited infrastructure—moderate these dynamics. This implies that contextual factors (governance quality, market maturity, cultural norms) critically shape how sustainability strategies translate into renewable adoption.

3.3 Integrative Discussion

Synthesizing the above themes, it becomes evident that corporate renewable energy adoption in emerging economies is both opportunity-driven and constraint-laden.

Firms act strategically under a dual logic: compliance with institutional norms and value creation through sustainable innovation.

The findings align with global literature but highlight context-specific realities. For example:

Institutional support (e.g., stable policies, incentives) is a stronger predictor of adoption in emerging markets than in developed economies.

Internal capabilities (e.g., leadership, innovation, culture) mediate how firms leverage external pressures into strategic action.

Hybrid motivations—balancing ethical, economic, and reputational considerations—are more prevalent among firms in transitional economies.

This interplay suggests that future research should explore multi-level frameworks linking macro policies, meso-level industries, and micro-level firm dynamics to fully understand sustainability transitions in developing contexts.

3.4 Research Gaps and Future Directions

Despite the growing body of literature, several gaps remain.

Empirical Gaps

Few longitudinal studies assess long-term financial or environmental outcomes of renewable energy adoption.

Limited cross-country comparisons hinder generalizability across emerging markets.

Small and medium enterprises (SMEs) remain underrepresented in the empirical literature.

Theoretical Gaps

The integration of RBV and Institutional Theory requires further exploration to capture external–internal interactions.

Emerging theories such as stakeholder salience and sustainability-oriented innovation (SOI) need deeper testing in firm contexts.

Methodological Gaps

Overreliance on cross-sectional data limits causal inference.

Future research could apply mixed-method and meta-analytic approaches for more robust synthesis.

Use of machine learning-based bibliometric analysis could enhance trend prediction and thematic clustering.

3.5 Summary of Findings

Overall, this systematic review reveals that:

1. Corporate renewable energy adoption in emerging economies is driven by strategic intent and institutional legitimacy pressures.
2. Financial, policy, and technical barriers remain persistent but can be mitigated by leadership commitment and innovation.
3. Firms integrating renewables into their sustainability strategies often achieve enhanced environmental and reputational performance, with potential long-term financial gains.
4. Theoretical integration and cross-sectoral studies remain key frontiers for future scholarship.

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