Risk Assessment in Green Financing: Balancing Profitability and Sustainability in Indian Companies

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Abstract

As the global economy increasingly transitions toward sustainability, green financing has emerged as a critical mechanism for aligning corporate growth with environmental stewardship. In the Indian context, businesses are confronted with the dual imperative of maintaining profitability while advancing sustainable investment practices, particularly in light of concurrent demands for climate change mitigation and rapid economic development.

This study explores the role of green financing in Indian enterprises, with a specific emphasis on the risk assessment frameworks that inform investment decisions. Relying on secondary data sourced from government publications, financial disclosures, and industry analyses, the research evaluates the integration of environmental, social, and governance (ESG) risks into corporate financial strategies across three sectors: energy (Tata Power, NTPC), infrastructure (L&T, GMR), and manufacturing/IT (Infosys, M&M). The study concludes that a hybrid approach integrating sustainability performance indicators with traditional financial risk assessment tools is essential for effective risk management in green financing.

Keywords: *Green Financing, Sustainability, Risk Assessment, Corporate Growth, Finance Ecosystem*

1. Introduction

The convergence of finance and sustainability has created new paradigms in corporate policy. Climate change has been identified as a systemic financial threat with the potential to undermine markets, destabilize supply chains, and reduce returns on investment. In India, this context is particularly pressing: the country is both the world's third-largest carbon dioxide emitter and a renewable energy leader, with targets of 500 GW non-fossil fuel capacity by 2030 and net-zero emissions by 2070.

To achieve these objectives, corporate India needs to mobilize large capital resources through green finance tools such as green bonds, sustainability-linked loans, and blended finance. However, green financing mechanisms entail significant risk-reward trade-offs tied to capital intensity, regulatory uncertainty, and unpredictable adoption curves.

2. Literature Review

2.1 Evolution of Green Financing

The OECD defines green financing as investments that offer measurable environmental benefits, especially in reducing climate change. Key instruments include: Green Bonds (first developed by the European Investment Bank in 2007); Sustainability-Linked Loans (SLLs); Equity-based ESG Funds; Blended Finance Mechanisms; and Carbon Finance through emissions trading.

2.2 Indian Green Finance Ecosystem

India's green finance market is growing but remains in its early stages compared to global standards. The RBI (2023) estimates India will need USD 100-200 billion annually until 2030 to meet climate goals. By end-2024, overall sustainable debt (GSS+) reached approximately USD 55.9 billion. Challenges remain: higher cost of capital (9-12% in India versus 4-6% in Europe) and low domestic retail investor awareness of ESG instruments.

2.3 Risks in Green Financing

- Financial Risk: High upfront costs for solar, wind, and EV infrastructure; longer payback periods; reliance on subsidies for profitability.
- Policy/Regulatory Risk: Sudden removal of renewable subsidies in 2019 led to increased market volatility; evolving carbon pricing frameworks create ongoing uncertainty.
- Market/Technology Risk: Slow EV adoption (~2-3% of new car sales in India in 2024/25); risk of

technological obsolescence from next-generation batteries.

- ESG/Reputational Risk: Growing scrutiny from SEBI and rating agencies MSCI and Sustainalytics; greenwashing risk if disclosures lack measurable supporting actions.

3. Methodology

This investigation employs a qualitative and exploratory multi-case study design supported by descriptive statistics. Six companies were purposively selected: Tata Power and NTPC (energy); Larsen & Toubro and GMR Infrastructure (infrastructure); Infosys and Mahindra & Mahindra (IT/manufacturing). The Hybrid Risk Assessment Model (HRAM) incorporates financial risk analysis (debt/equity ratios, ROI, IRR, NPV), policy risk analysis, market risk analysis, and ESG/reputational risk analysis.

4. Findings

4.1 Energy Sector

Tata Power: Over 30-35% of capacity comes from renewables by 2025; raised over USD 400 million in oversubscribed green bonds; improved MSCI ESG score. However, upfront capex is 40-60% higher than conventional projects, and the debt/equity ratio rose to 1.8 in 2023 from 1.3 previously.

NTPC: Expanding renewable portfolio to ~9 GW by 2025 and pioneering floating solar projects. Coal still accounts for 55-60% of total generation, exposing the company to stranded asset risk potentially valued at USD 5-6 billion if coal is phased out faster than anticipated.

4.2 Infrastructure Sector

Larsen & Toubro is driving green building certifications and investing in green hydrogen infrastructure. Risks include project finance exposure, rising compliance costs from mandatory BRSR disclosures, and capital lock-in in projects with 20-30 year recovery cycles.

GMR Infrastructure is pursuing carbon neutrality for Delhi International Airport by 2030. Demand volatility in aviation directly affects cash flows, and ESG-driven investors are increasingly sceptical of aviation's carbon footprint, limiting green capital access.

4.3 IT & Manufacturing Sector

Infosys became carbon neutral in 2020, sources 60-70% of electricity from renewables, and employs internal carbon pricing (USD 10/ton CO2). Consistently recognized in the Dow Jones Sustainability Index (DJSI), its ESG-forward strategy directly influences investor confidence and foreign client acquisition.

Mahindra & Mahindra has an EV portfolio under its 'Born Electric Vision,' targeting 1 million EVs by 2030. However, EV adoption remains below 3% of passenger sales in India (2025), and the company is heavily dependent on government subsidies (FAME-II).

5. Conclusion

Green finance is a transformative but complex field. India's tracked green finance reached approximately INR 3.7 trillion (USD 50 billion) annually in 2021/22 — a 20% increase from 2019/20 — yet this covers only approximately 30% of the estimated annual investment needed to meet India's 2030 climate targets.

Businesses implementing integrated hybrid risk frameworks — combining ESG metrics with conventional financial evaluations (NPV, IRR, leverage ratios) — are positioned for competitive advantage through improved stakeholder trust, regulatory compliance, and capital inflows. Corporate India's long-term global competitiveness will be significantly shaped by its ability to balance profitability with climate responsibility, as India's green finance ecosystem is expected to require over USD 2.5 trillion by 2070.

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