

INDIAN GREEN BOND MARKET: PROGRESS AND CHALLENGES ON THE ROAD TO NET ZERO

Abstract

The article highlights India's significant annual investment requirement exceeding \$160 billion in its energy sector alone between 2022 and 2030, culminating in a total funding gap of over \$3 trillion to realize its Net Zero by 2070 commitment (**IEA, 2024**). The Green Bond market is a cornerstone of this strategy. Since the first domestic issuance by Yes Bank in 2015, cumulative issuance reached approximately \$21 billion by 2023 (**World Bank, 2025**). The key catalyst was the debut of the Sovereign Green Bond (SGrB) in January 2023, which has since raised ₹440 billion (approx. \$5.3 billion) (**Grip Invest, 2025**), setting a transparent pricing benchmark. This growth is underpinned by the enhanced SEBI Green Debt Securities Framework (2023) (**SEBI, 2023**). Despite progress, the market is constrained by the elusive 'Greenium' (pricing advantage), with SGrBs achieving only a modest 2–3 basis points (**Grantham Research Institute, 2023**). Other impediments suggested by the author include low secondary market liquidity and a transparency deficit. The article recommends demand-side stimulation, including targeted tax incentives and finalizing an authentic national Green Taxonomy.

Introduction: Mobilizing Capital for a Sustainable Future

1. India is at a critical juncture, balancing rapid economic growth with ambitious climate goals. The Panchamrit pledges at COP26 commit India to Net Zero emissions by 2070 and a 45% reduction in the emissions intensity of its GDP by 2030. Achieving these requires massive capital



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mobilization, especially for energy transition and climate-resilient infrastructure. Estimates suggest an annual investment exceeding \$160 billion in the energy sector alone between 2022 and 2030, leading to a total funding gap of over \$3 trillion to fully achieve the Net Zero vision (**IEA, 2024**). Traditional public finance is insufficient to bridge this gap. Consequently, the Green Bond market has become central to India's sustainable finance strategy.

2. Green Bonds are debt instruments issued exclusively to finance or re-finance green projects, such as renewable energy and sustainable waste management. They are instrumental in 'green-tagging' capital flows, directing private-sector liquidity toward environmental projects, and simultaneously helping institutional investors meet their Environmental, Social, and Governance (ESG) mandates. While the Indian market has evolved significantly, encompassing sovereign and municipal debt, its maturity is hampered by structural challenges like the elusive 'greenium' low secondary market liquidity, and transparency issues (**Jena & Vuppuluri, 2024**). This article analyses the progress, examines critical barriers, and proposes a roadmap for sustained growth in service of India's national climate strategy.

The Evolution of the Indian Green Bond Market: Milestones and Growth

3. The trajectory of the Indian Green Bond market comprises three phases: the pioneering private sector era, the regulatory establishment phase, and the sovereign catalyst era.

Pioneering Corporate and Financial Issuance

4. The market's genesis was the first domestic Green Bond issued by Yes Bank in 2015 (₹1,000 Crore, approximately \$150 million). Subsequent key issuances came from institutions like the Indian Renewable Energy Development Agency (IREDA) and Greenko. Early green debt was often executed in the offshore market via 'Masala Bonds' (INR-denominated bonds issued outside India), indicating strong international interest but limited initial domestic depth. By 2023, cumulative green bond issuance stood at approximately \$21 billion (**World Bank, 2025**), with the private sector commanding an overwhelming majority share (estimated at around 84%).

The Municipal Market Emergence

5. A crucial development was the entry of municipal bodies. The Ghaziabad Nagar Nigam (2021) and the Indore Municipal Corporation (2023) were pioneers, raising capital for water supply and solar power projects. The

oversubscribed Indore issuance, listed on the National Stock Exchange (NSE), paved the way for subsequent entries from Ahmedabad and Vadodara in 2024.

The Sovereign Catalyst and Market Acceleration

6. The defining moment was the debut of the Sovereign Green Bond (SGrB) in January 2023. Issued by the RBI on behalf of the Government of India, the first tranche raised ₹80 billion (approx. \$1 billion). This issuance was vital because it:

- Set a Benchmark:** Established a transparent pricing benchmark for domestic green finance.
- Expanded Investor Base:** Attracted new classes of domestic and foreign investors, including insurers.
- Provided Scale:** The government has become the single largest issuer, raising a total of ₹440 billion (approx. \$5.3 billion) in SGrBs since January 2024 (**Grip Invest, 2025**).

7. Proceeds from the FY 2022-23 SGrB issuance were primarily allocated to Clean Transportation (78%) and Renewable Energy (21%) (**Government of India, 2024**). *The table below reflects the important milestones of Indian Green Bond Market and its cumulative issuance.*

Table 1

Phase	Time Period	Key Issuances/ Milestones	Cumulative Issuance (Approx.)	Purpose/Significance
Pioneering Private Sector	2015 – 2017	First domestic bond by Yes Bank (2015); Issuances by IREDA and Greenko.	Small, dominated by private/corporate.	Established proof of concept; heavy reliance on offshore 'Masala Bonds'.
Municipal & Regulatory Establishment	2018 – 2022	SEBI's initial GDS Guidelines; Ghaziabad Nagar Nigam (2021).	Growing, still primarily private.	Democratization of the instrument; development of a formal regulatory base.
Sovereign Catalyst & Acceleration	2023 – Present	Sovereign Green Bond (SGrB) debut (Jan 2023); Enhanced SEBI GDS Framework (2023); Indore municipal success.	\$21 billion by 2023; SGrB: ₹440 billion (\$5.3 billion) since 2024.	Sovereign benchmark set; rapid market scaling; enhanced transparency mandates (SPO).

Critical Analysis of Indian Green Bond Market Growth Comparative Growth Analysis (India vs. Global)

The Indian Green Bond market has demonstrated commendable growth, achieving \$21 billion in cumulative issuance by 2023 (**World Bank, 2025**), a significant feat given its relatively late start in 2015. However, its progress remains relatively modest when benchmarked against the global market's scale.

The global cumulative issuance surpassed \$1 trillion in 2020 and has since grown rapidly, with annual global issuance often exceeding \$500 billion in recent years (**World Bank, 2025**). India's \$21 billion cumulative total is dwarfed by the size of established markets like the US and the European Union, which benefit from decades of established financial architecture and comprehensive Green Taxonomies.

The critical difference lies in market depth and liquidity. Globally, the Green Bond market consistently commands a Greenium of 7–17 basis points (bps) (**Baker McKenzie, 2019**), providing a clear financial incentive for issuers. In contrast, India's SGrBs have only managed a modest Greenium of 2–3 bps at initial auctions (**Grantham Research Institute, 2023**), and the market has even seen 'Brown Discounts' (yields higher than conventional bonds), necessitating auction cancellations (**Grantham Research Institute, 2023**). This lack of a compelling 'Greenium' in India signals a fundamental gap in investor appetite for prioritizing the "green" label over mandatory financial returns, especially among domestic investors. Furthermore, India's low secondary market liquidity, driven by a domestic 'buy-and-hold' strategy, hinders the ease of entry and exit required by large global

The Sovereign Catalyst and Market Cap

India's \$21 billion Green Bond market got a boost from the **Sovereign Green Bond (SGrB)** debut in January 2023. The SGrB has raised **₹440 billion (\$5.3 billion) (Grip Invest, 2025)**.

However, the market remains constrained by structural issues. These include the minimal '**Greenium**' (only **2-3 bps** for SGrBs) (**Grantham Research Institute, 2023**) and low secondary market liquidity, which limits market appeal and depth.

institutional investors, thus limiting foreign participation and market depth compared to more mature global centres.

The Regulatory and Policy Architecture

8. The market's development is supported by concerted efforts from the Securities and Exchange Board of India (SEBI) and the RBI.

SEBI's Green Debt Securities Framework

9. SEBI, the capital markets regulator, has enhanced its framework for Green Debt Securities (GDS). Its 2023 update aligned the domestic framework with the International Capital Market Association's (ICMA) Green Bond Principles. Key advancements include:

- a. **Expanded Scope:** Widening the definition of "green" projects to include climate adaptation and energy efficiency (**S&R Insights, 2024**).
- b. **Mandatory Disclosure:** Requiring pre-issuance disclosures and post-listing reports on the utilization of proceeds and environmental impact.
- c. **Third-Party Review:** Introduction of a mandatory independent third-party reviewer (Second Party Opinion - SPO) to validate ESG objectives, bolstering investor confidence and combating 'greenwashing' (**SEBI, 2023**).

The Sovereign Green Bond (SGrB) Framework

10. The Ministry of Finance's **SGrB Framework (2022)** sets the gold standard for sovereign issuance. It established the Green Finance Working Committee (GFWC) to

oversee eligible project selection. The framework mandates a dedicated ‘Green Register’ and a separate account for proceeds allocation, ensuring high transparency and accountability.

The Developing Green Taxonomy

11. India currently relies on its SGrB framework and SEBI’s GDS definitions. The absence of a comprehensive, legally binding national Green Taxonomy, similar to the EU’s, hinders investor clarity and increases transaction costs. The Union Budget 2024-25 signalled a commitment to establishing such a taxonomy to provide definitive, scientific criteria for ‘green’ activities (Shastri et al., 2025), which is expected to boost participation and reduce greenwashing risk.

Critical Challenges and Impediments to Growth

12. Despite progress, fundamental structural challenges constrain the market’s potential (Srivastava & Sharma, 2023).

The Elusive Greenium

13. The primary goal, the ‘Greenium’ (yield discount over comparable conventional bonds), has been minimal in India, with SGrBs achieving only 2–3 bps (Grantham Research Institute, 2023). Recent market trends have shown a ‘Brown Discount’ (investor-demanded yields higher than expected), leading the RBI to cancel portions of SGrB auctions in May 2024 and June 2025 (Jena & Vuppuluri, 2024). This is due to a mismatch between the government’s expectation for investors to accept lower yields for environmental benefit, and the domestic investor reality, where returns are prioritized over the ‘green’ label.

Low Liquidity and Investor Demand Constraints

14. The **secondary market is thin and illiquid**, deterring large institutional investors. This low liquidity results from:

- a. **Buy-and-Hold Strategy:** Domestic investors, particularly insurance and

pension funds, hold SGrBs until maturity (Agarwal & Singh, 2018).

- b. **Small Issue Sizes:** Issue sizes are small relative to the conventional bond market, limiting trading volume.
- c. **Limited Foreign Participation:** FII participation has been lower than expected due to perceived risks and an insufficient Greenium.

Greenwashing and Transparency Deficit

15. Trust is foundational, and it is tied to credible post-issuance reporting. Challenges include:

- a. **Delayed Impact Reports:** The delay in releasing timely post-issuance allocation and impact reports (e.g., the FY 2023-24 SGrB report) reduces investor confidence.
- b. **Lack of Contractual Protection:** Green bond terms often lack strong contractual covenants (like default clauses) for misuse of proceeds, leaving bondholders with limited legal recourse against greenwashing.

High Issuance Costs and Capacity Building

16. For smaller, first-time issuers, the complexity and upfront cost are prohibitive (Srivastava & Sharma, 2023). These costs include:

- a. **Second Party Opinions (SPOs):** The cost of engaging independent external reviewers for pre-issuance certification and post-issuance verification.
- b. **Tracking and Reporting:** The need for separate internal systems to track project expenditure and measure environmental impact adds operational complexity.

Policy Recommendations for Market Maturation

17. A multi-pronged strategy is essential to unlock the market’s potential.

Structural and Financial Incentives

- a. **Targeted Tax Benefits:** Introduce tax incentives on green bond interest income to make the instrument more financially

appealing to domestic investors, effectively replacing the market-demanded “greenium”.

b. Subsidies for Issuance

Costs: Provide a partial or full subsidy for the cost of obtaining the SPO and initial audit for first-time or sub-sovereign issuers (municipalities).

c. RBI’s Role in Liquidity:

The RBI should explore actively participating in the secondary market for SGrBs as a liquidity provider to improve trading volumes and appeal to short-term investors.

Fixing the Funding Gap

To fund its \$3 trillion Net Zero commitment (**IEA, 2024**),

India needs to pivot to **demand-side stimulation**.

Key challenges are the lack of a compelling pricing advantage and a **transparency**

deficit from delayed impact reports (**TERI, 2023**). The

roadmap for growth requires implementing **targeted tax**

incentives on green bond interest and the immediate

adoption of a science-backed national **Green Taxonomy**

(**Shastri et al., 2025**)

of Second Party Opinion (SPO) providers, verifiers, and independent auditors to reduce costs and reliance on international agencies.

b. Retail Investor Awareness:

Promote ease of investment for retail investors via green-themed mutual funds or exchange-traded funds (ETFs) to deepen the domestic demand base.

c. Financial Innovation:

Encourage new instruments like **Sustainability-Linked Bonds (SLBs)** and **Transition Bonds** to mobilize capital for high-emitting sectors that require decarbonization.

Regulatory Harmonization and Enforcement

a. Finalizing the Green Taxonomy:

The immediate adoption of a clear, harmonized national Green Taxonomy is paramount (**Shastri et al., 2025**). It must be based on a science backed ‘Do No Significant Harm’ (DNSH) principle.

b. Mandatory and Timely Reporting:

SEBI must enforce stricter rules and timeframes for post-issuance impact reporting (e.g., within 90 days of the financial year end). Non-compliance should carry meaningful penalties.

c. Developing a Project Pipeline:

Central and State governments must collaborate to create a visible, high-quality, and investable pipeline of pre-packaged green infrastructure projects to increase asset supply.

Capacity Building and Innovation

a. Domestic Verification Ecosystem: Invest in fostering a robust domestic ecosystem

Conclusion

The Indian Green Bond market has moved from its nascent phase to become a vital part of the nation’s climate finance architecture. The Sovereign Green Bond (SGrB) has served as a powerful catalyst, establishing a pricing benchmark and attracting new capital pools. Similarly, the evolution of SEBI’s regulatory framework reflects a strong commitment to global standards of integrity and transparency (**SEBI, 2023**). Nevertheless, the market’s reliance on sovereign issuance and its failure to consistently generate a competitive ‘Greenium’ point (**Grantham Research Institute, 2023**) to a core structural fragility. The challenges of low secondary market liquidity, regulatory enforcement gaps, and high compliance costs risk capping the market’s potential well short of India’s multi-trillion-dollar financing need (**IEA, 2024**). The path forward requires a strategic pivot toward demand-side stimulation. By implementing targeted financial incentives (tax benefits), finalizing a comprehensive national Green Taxonomy, and enforcing rigorous, timely

impact reporting, India can transform its Green Bond market from a policy signalling instrument into an engine for large-scale, private-sector-led climate transition. The success of this market is a prerequisite for India's global credibility and its ability to secure a sustainable, low-carbon future. **MA**

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