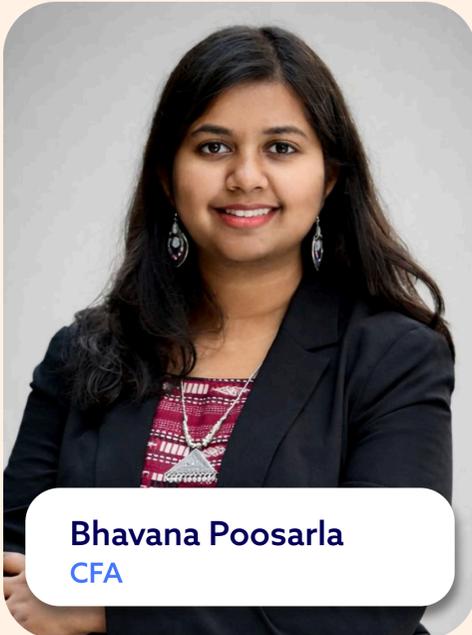


FINANCING INDIA'S GREEN TRANSITION

THE CASE FOR SUSTAINABLE DEBT



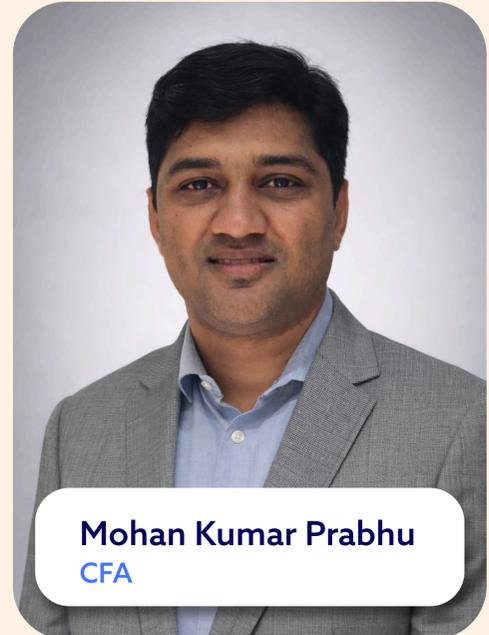
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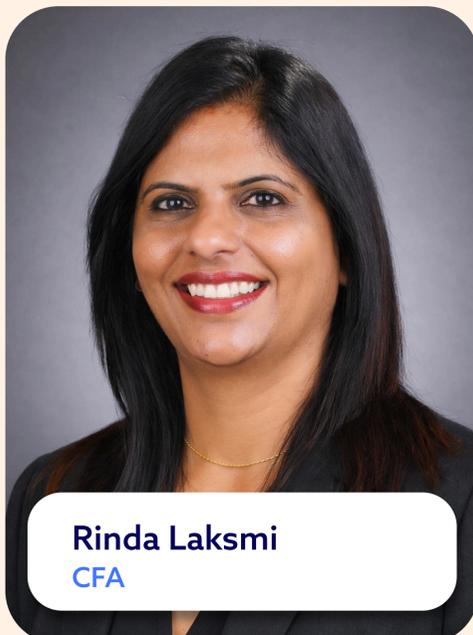
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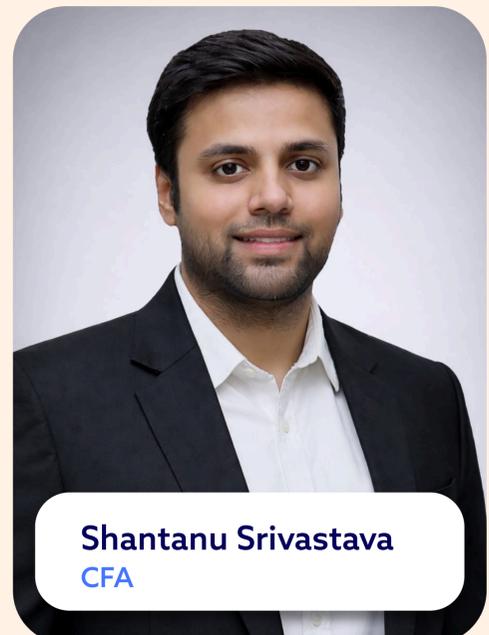
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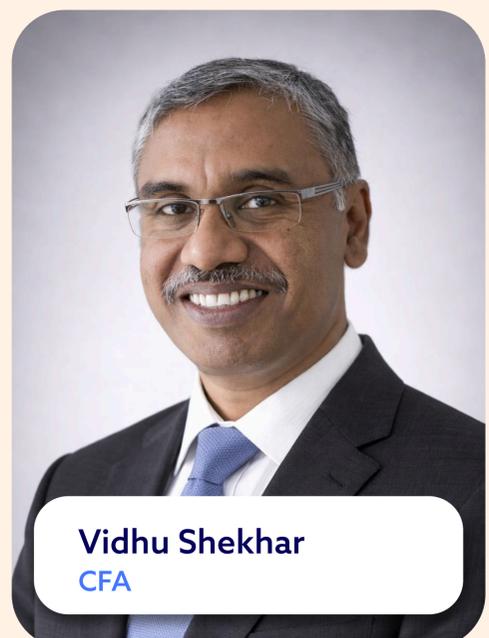
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01 KEY FINDINGS

India needs to mobilise \$ 22.7 trillion of capital to meet its net-zero goal by 2070, with \$ 8.05 trillion needed over 2026-50. However, India faces a financing gap of \$ 2.5 trillion over 2026-2050, which widens significantly to \$ 6.5 trillion by 2070. Notably, this shortfall is predominantly in debt financing.

(Source: NITI Aayog, 2026)

Financing gaps and the role of alternative debt providers:

Several green transition sectors continue to face limited access to financing due to higher perceived risks and the reliance on conventional debt financing models. This creates opportunities for alternative debt providers and non-traditional financing structures to address these gaps.

Nascent sustainable debt market:

India's sustainable debt market remains relatively small compared to global peers. India's cumulative sustainable debt issuance size was \$ 55.9 billion by the end of 2024, in vs global peers such as China at \$ 555.5 billion (CBI, 2025). With no transition bonds or transition loans issued yet, and enormous capital required for green transition, there is substantial untapped potential in the sustainable debt market.

Regulatory progress but limited market depth:

SEBI and RBI have aligned India's sustainable finance framework more closely with global standards. However, a narrow corporate bond market and evolving climate-related regulations continue to constrain scale.

Green bonds:

India's green bond market is growing but remains underutilised due to indifference in pricing of these bonds compared to conventional bonds. Reducing certification and friction costs, strengthening confidence in the use of proceeds, and improving issuer incentives can make it a core long-term green transition financing instrument.

🔗 Transition bonds:

Transition bonds offer a practical financing option for hard-to-abate sectors, provided that a clear transition taxonomy and mandatory, credible transition plan disclosure requirements are established.

🔗 Transition loans:

Although transition loans have not yet emerged in India, they could support decarbonization in carbon-intensive sectors if supported by regulatory guidance, clarity on taxonomy, and pricing incentives.

🔗 Sustainability-linked bonds (SLBs):

SLBs offer flexibility for high-emission sectors to pursue gradual transition pathways. However, limited incentives, modest pricing benefits, and concerns regarding weak performance targets and disclosures limit their adoption in the domestic market.

02 CONTEXT AND PURPOSE

This report is intended for a broad set of stakeholders involved in the mobilisation, allocation, and regulation of capital in India, including institutional investors, asset managers, banks, non-banking financial companies, policymakers, regulators, and market intermediaries. It is also relevant for corporations seeking to utilise sustainable debt instruments to raise debt capital, as well as for academics and practitioners interested in the evolution of sustainable finance in India.

The purpose of this report is to examine the role of sustainable debt in financing India's transition toward a more sustainable and resilient economy, as well as the necessary policy and regulatory interventions required to accelerate the adoption of this innovative financial instrument.

While sustainable debt issuance in India has increased in recent years, the market remains relatively small and heterogeneous, with evolving practices across instruments, issuers, and sectors. By analysing key sustainable debt instruments, market developments, and regulatory frameworks, this report aims to provide an analytical reference for understanding the structure, opportunities, and challenges to sustainable debt markets in the Indian context. Additionally, the report highlights necessary policy and regulatory interventions that may support the development and deepening of India's sustainable debt market.

03 INTRODUCTION

India, as one of the largest and fastest-growing economies, plays a significant role in supporting global efforts to mitigate climate change. On the other side, India is one of the most vulnerable countries to climate change, so parallel and equal efforts are required to step up climate adaptation. Notwithstanding these difficulties, India has the intention and commitment to develop guardrails in a sustainable manner, ensuring that current needs are met without compromising the ability of future generations to meet their own needs. India has committed to achieving a net-zero (negating the amount of greenhouse gases produced by human activity) target by 2070. India is close to reaching its NDC targets, which include reducing the carbon intensity of GDP by 45% by 2030 compared to 2005 and achieving 50% of total installed capacity for electricity generation from renewable sources. However, this may not be sufficient for achieving the goal of net zero by 2070.

India Needs a Massive Amount of Capital for Climate Action

Adequate capital is a critical enabler of the green economic transition, supporting both climate mitigation and adaptation, while not compromising other sustainability goals. As per various estimates, India needs \$ 22.7 trillion from 2026 to 2070, and a significant portion is required in the next 20 years.¹ Furthermore, additional capital is required for climate adaptation and other sustainable initiatives.

Meeting this scale of financing will require a combination of public finance, equity (through stock markets, private equity or balance sheet funding), and debt capital, each serving a distinct purpose. Public and concessional finance are essential for policy support, risk mitigation, and early market development. At the same time, equity capital plays a critical role in absorbing risk, particularly for early-stage or innovative technologies, or for large companies with adequate balance sheet capacity. A large proportion of the required investment will be directed toward capital-intensive assets with long economic lives, such as renewable energy generation, transmission infrastructure, clean transportation, and industrial decarbonization, which are typically expected to generate stable and predictable cash flows once operational. These characteristics make such assets well-suited to long-term debt financing. As a result, debt markets will play a central role in mobilising capital at scale and supporting the affordability and financial viability of green assets.

Hence, the financial sector in India will play a crucial role in mobilising the necessary resources and developing innovative financial instruments required to meet India's net zero and sustainability goals. It is noteworthy that the financial sector is also vulnerable to climate change, and capital flows toward climate actions will make the sector resilient to climate change.

04 GREEN TRANSITION

Risk and Opportunity for Investors

Crisis and opportunity may never be the same, but it is often true that desperate times demand desperate measures, which lead to fresh thinking and innovative approaches. No wonder there are several different versions of "Never Let a Good Crisis Go Waste" available in history, used in various situations and contexts. No one should invite crises, and we should do everything possible to avoid them. However, natural and man-made disasters will continue, as will war and other forms of disruption. Simply speaking, change will occur, both welcome and unwelcome. Nevertheless, Climate change is unlike any other phenomenon humankind has seen so far. While it is surely a crisis, it can also become an opportunity to usher in a new and better world for future generations.

How Big is the Risk

Estimates suggest that the global cost of climate change damage will be between \$1.7 trillion and \$3.1 trillion per year by 2050.² The increasing intensity and frequency of climate-induced weather events have already begun to damage infrastructure, property, agriculture, and human health, and this trend is expected to intensify over time as the impacts of climate change become more severe. India is ranked the fifth most vulnerable nation to the effects of climate change, with up to 4.5% of its GDP at risk annually.³ A recent report by the Asian Development Bank suggests that 24.7% of India's GDP could be wiped out by 2070 due to climate change risk.⁴ Over the last couple of years, the Reserve Bank of India (RBI) has warned that climate change poses a systemic risk to India's financial system.⁵ These extreme weather events, along with chronic risks (e.g., sea level rise), are making the economy vulnerable, which in turn affects the financial system, known as physical risk. Property damage, business disruption, loss of income, and a decrease in the valuation of physical assets can make businesses vulnerable and create financial risks.

On the other hand, the global efforts to transition to a green economic system are making GHG-emitting businesses riskier, a phenomenon known as transition risk.

Stringent policies and regulations (e.g., carbon pricing, climate change disclosure), a drastic fall in low-carbon technology products, and market preferences for low-carbon products make carbon-intensive businesses vulnerable.

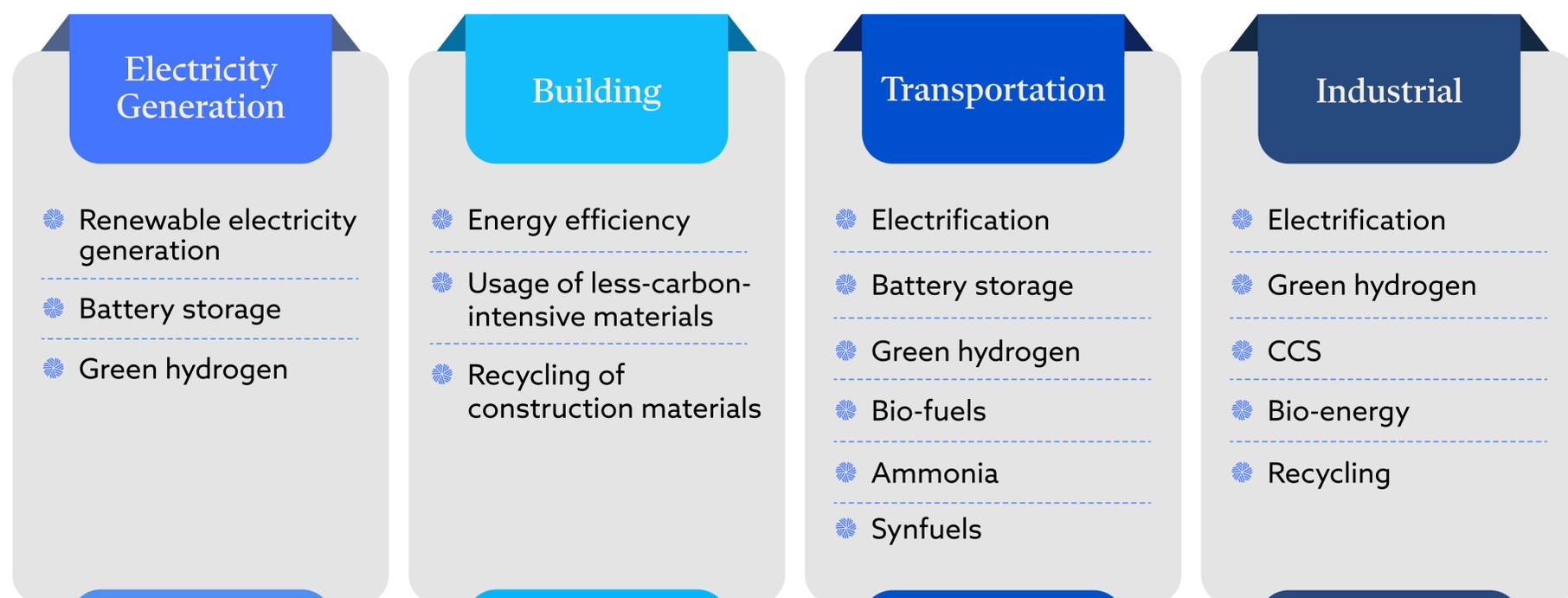
Climate change is not only a risk to society but is already recognised as a systemic risk to financial stability (BIS, 2020; NGFS, 2019). Due to increased environmental scrutiny and long-term climate change risks, carbon-emitting industries, such as mining, fossil fuel, and coal-based power plants, are currently facing physical and transition risks (Mercer, 2015).

The financial performance of these sectors is likely to erode in the future, consequently negatively affecting the portfolio performance of banks and institutional investors with exposure to these sectors (Jena et al., 2018).

Massive Opportunity for Debt Investors

Any transition or response to change requires investments, and climate change is no different. The green-climate mitigation and adaptation-economic transition creates a massive, multi-decade investment opportunity that will require an extraordinary amount of investment capital, ranging from \$ 100 trillion to \$ 150 trillion globally. The estimates would vary depending on the source, but the key point is that addressing climate change challenges successfully will require a significant effort and substantial funding. Opportunities exist in several different technologies and financial assets. Investment opportunities in multiple and new technologies and across the sector - renewable energy, resource efficiency, green hydrogen, energy storage, and building resilience along the supply chain. Investment opportunities are also available at various stages (from early to commercial proven) and require different types of capital (venture capital to bonds).

Figure 1: Opportunities in Various Technologies



Opportunity in India

Estimates by various agencies suggest India will need a massive amount of capital to decarbonise its economy. Capital is required for power generation, energy storage, electric vehicles, transmission, and distribution. Between 2025 and 2030, India is expected to require an additional \$ 250 billion in the electricity sector (power generation, transmission, and distribution) to achieve its goal of 500 GW capacity by 2030.

Of the \$ 22.7 trillion of capital required for the net-zero transition, a majority of the investments, close to \$ 8.4 trillion, will be necessary to transform India's power sector through scaling up renewable energy generation and developing the associated integration, distribution, and transmission infrastructure. The industrial sector will need an additional \$ 1.5 trillion to build green hydrogen production capacity.⁶ Decarbonising the transportation sector will require further capital, especially for purchasing electric and hydrogen-powered long-distance vehicles. It is difficult to quantify debt and equity capital requirements. However, most of these technologies are capital-intensive, so that debt capital will play a critical role. Additionally, the largest chunk of funding required is for the power sector, where low-cost debt financing will be crucial to make power more affordable.

Government policy support, rising corporate ESG adoption, increased global investor interest, growing domestic demand for sustainability, and advancements in sustainable innovation are driving progress in these sectors. These dynamics create massive investment opportunities across low-carbon sectors, asset classes, and maturities. For instance, driven by increasing power demand, the transition to renewable energy, and the modernisation of outdated infrastructure, India's power sector presents a massive multi-decade investment opportunity, with an estimated \$ 480 billion needed over the next decade.⁷

Banks and institutional investors can tap into these opportunities through sustainability-related investment themes, financial instruments (e.g., green bonds and loans, sustainability-linked bonds, transition bonds, and loans), and financial vehicles (e.g., ESG mutual funds, green indices) designed to support low-carbon technologies and sustainability.⁸

Integrating climate change in lending and investment is not only an opportunity but also a fiduciary responsibility. It is imperative that investments and lending to projects addressing climate risk are evaluated on merit, alignment with end objectives, and credible execution plans, so that they are eventually funded accordingly.

In this report, we will cover the theme of sustainable debt. This is the first attempt by the CFA Society in India to analyse and assess the sustainable debt finance market. As this market is in its early stages, it is challenging to forecast investment/lending opportunities for investors and lenders; this becomes even more difficult when the political environment surrounding sustainability is hostile and unpredictable.



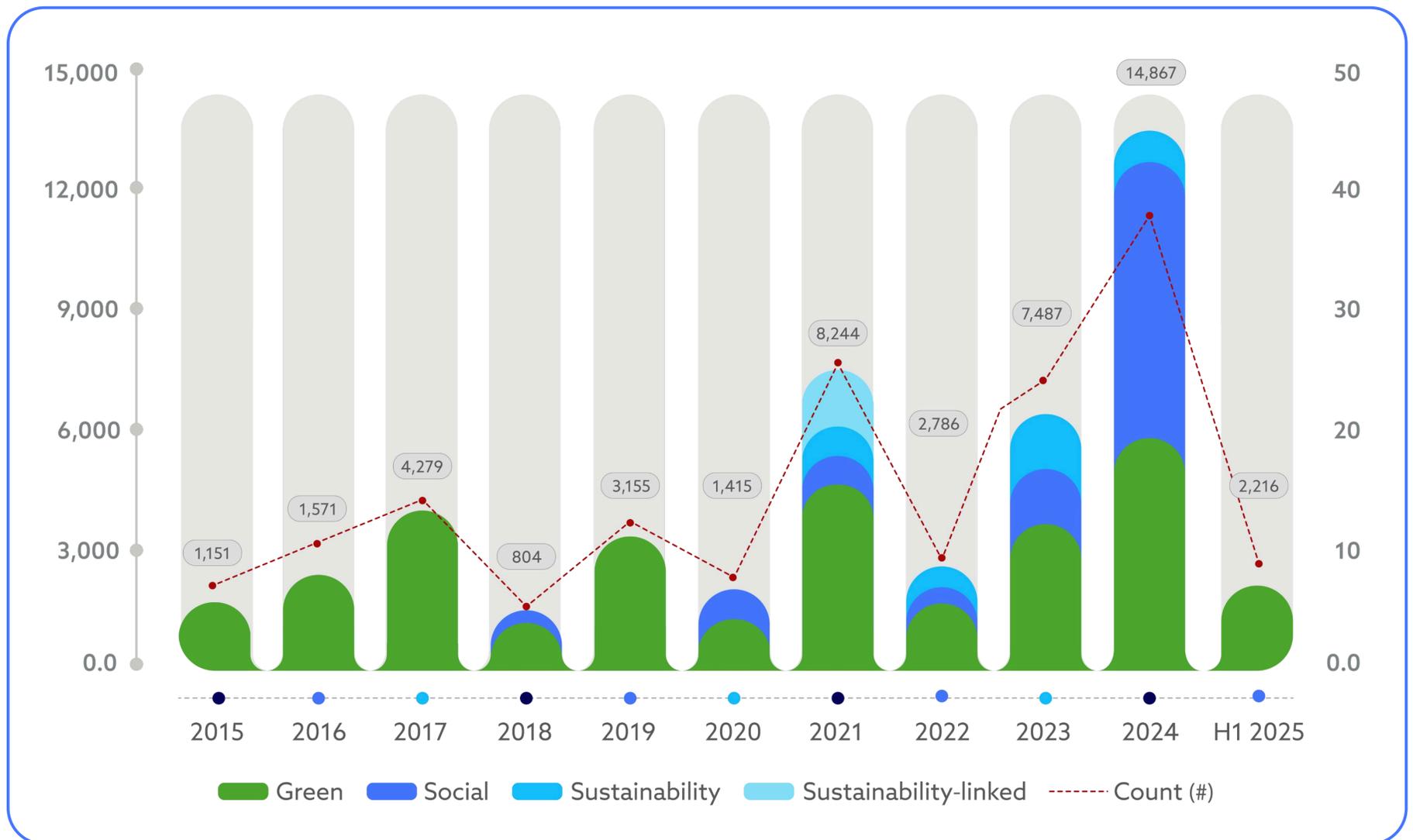
SUSTAINABLE DEBT INVESTMENT THEME

Most green technologies are capital-intensive and have long asset lives, requiring low-cost debt financing to make the adoption of technology affordable and generate sufficient returns for equity investors. Here, mainstream debt financiers, such as commercial banks and institutional investors, will find numerous lending and investment opportunities. It includes reorienting their capital from competing carbon intensive technologies to low-carbon technologies, such as transitioning from thermal power plants to renewable energy generation assets.

In addition, debt investment opportunities are available for NBFCs, AIFS (also known as private credit), and venture capital debt financiers, who seek higher returns and an appetite for higher risk, compared to commercial banks. Some segments in the energy transition, such as rooftop solar, energy-efficient machines, electric charging stations, and electric vehicles (e.g., three-wheelers), struggle to access capital from commercial banks because they are perceived as high-risk investments. In addition, several technologies are better suited to cash-flow-based debt rather than traditional collateral-based financing, creating opportunities for private credit and venture capital debt financiers. Moreover, they need structured loan solutions instead of standardised debt. Here, these debt financiers will play a more appropriate role as debt financiers, rather than traditional debt financiers.

By 1H2025, India's cumulative green, social, sustainability, and sustainability-linked (GSS+) bond market reached around \$ 48 billion.⁹, significantly smaller than the global GSS+ bond market size of \$ 6.2 trillion.¹⁰ Green bonds comprise the largest share of the market, though some borrowers managed to raise capital at lower coupon rates through green bond issuances outside India. Green loan issuances as of 1H2025 amounted to around \$ 32 billion, a small proportion of the global green loan issuances of around \$3.8 trillion.¹¹ India has not issued any transition bonds or loans, while globally, transition bond and loan markets amount to around \$ 39 billion and \$ 3 billion, respectively, as of 2024.¹²

Figure 2: Sustainable Bond Issuances in India by Value & Volume (in US\$ Mn)



Source: CBI Database

Most of the securities regulators across the globe (e.g., SEBI in India) and appropriate financial regulators (e.g., RBI for sovereign green bonds) have issued guidelines on the issuance of green and sustainable financial instruments. There are non-profit organisations that have principles and standards for these financial instruments. For instance, the International Capital Market Association (ICMA) has developed principles for green, social, and sustainability-linked bonds, while the Climate Bonds Initiative (CBI) has established principles and standards for green bonds.

There have been regulatory developments over the past few years, such as the introduction of India's Sovereign Green Bond Framework in 2022.¹³ and the revision of the Securities and Exchange Board of India's (SEBI) 'Disclosure Requirements for Issuance and Listing of Green Debt Securities'.¹⁴ They are expected to bolster the growth of the GSS+ bond market by enhancing transparency and aligning with global best practices. Although there are currently no transition bonds in India, SEBI introduced "Additional requirements for the issuers of transition bonds" to guide future issuances.¹⁵

2021 marked the first year that Sustainability-Linked Bonds (SLBs) were launched in India, with companies like UltraTech Cement, JSW Steel, and Adani Electricity Mumbai issuing SLBs worth \$ 1.7 billion that year.¹⁶

This shift complemented the growing impact investing sector, which continues to draw significant attention from both domestic and global investors. India's impact investing market continues to expand, with the Impact Investors Council reporting \$ 2.9 billion in equity investments toward 275 impact enterprises in 2023, though this was a decline from \$ 6 billion in 2022.¹⁷ South Asia remains a priority region for global impact investors, with 40% planning to increase their allocations over the next five years, according to the Global Impact Investing Network (GIIN).¹⁸

One of the key elements of the further development of the financial sector. India's corporate bond-market is moderate (~16% of GDP) compared to other middle-income and developed countries. The participants of long-term institutional investors in corporate bond markets, such as pension funds and insurance companies, are limited compared to their peers in developed markets. Financial regulation concerning climate change and sustainability in asset management is also limited, which doesn't push sustainability in the capital market. However, the RBI has taken several steps on sustainability and climate change, and is indirectly encouraging commercial banks to incorporate these risks and opportunities into their lending decisions, risk management, and disclosure. Similar steps by other financial regulators (e.g. PFRDA, IRDA, SEBI) will exert pressure on pension funds, insurance companies, and mutual funds to incorporate climate change and sustainability in their investment decision-making. These regulatory measures can lead to the development of a sustainable debt market in India.

Further convergence of regulatory support, innovative financing, and corporate responsibility can unlock unprecedented investment opportunities in the Indian sustainable investment landscape and accelerate India's low-carbon transition.

Each of the thematic debt instruments is discussed in greater detail.

5.1 Green Bond

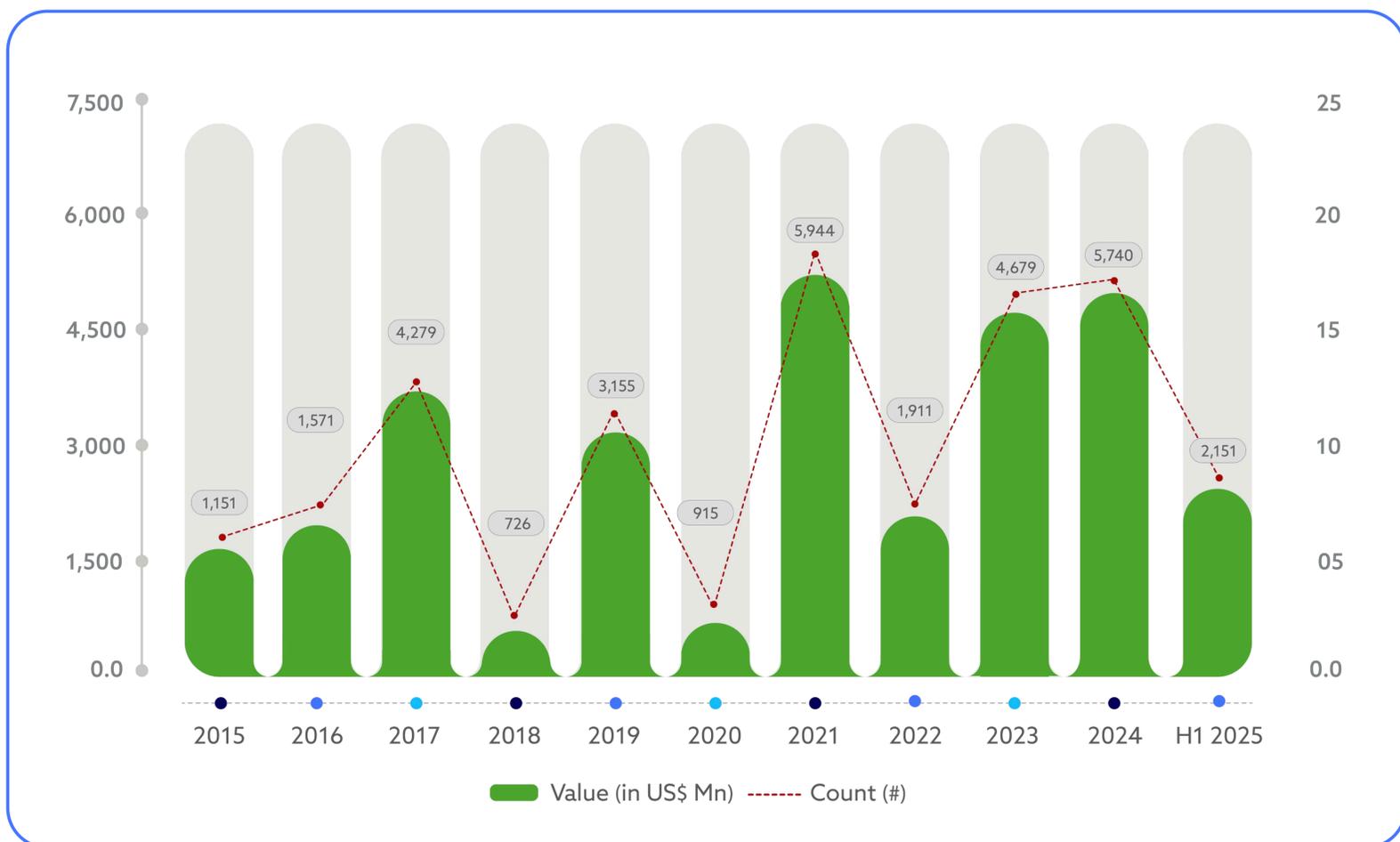
Green bonds are fixed-income instruments that are used exclusively to finance eligible projects with environmental benefits. Like other GSS+ bonds, it is a 'use of proceeds' bond, as proceeds raised from the sale of the bond are earmarked to fund only those projects contributing to a positive environmental impact, including climate benefits.

The global issuance of green bonds increased from a modest \$ 36.6 billion in 2014 to more than \$ 3 trillion by 2025, driven by policy support for green businesses, growing climate change awareness among investors, and an increased mandate for green investments. However, there are questions about whether issuers can raise debt capital at a lower rate, popularly known as the 'greenium', after incurring additional transaction costs such as verification and certification. There may be marketing benefits, potentially lowering the firm's cost of capital at the subsequent capital raise or improving business performance by attracting new customers.

➔ Green bond status and opportunities in India

In India, green bond issuances have been increasing as borrowers expect a lower cost of capital, enhance their public image, and send a signal of their evolving business practices towards sustainability. India ranks 28th among 82 countries in green bond issuance, with a total issuance of \$ 32.2 billion by the end of 1H2025, which represents only 0.9% of the global green bond market. In India, green bonds account for 67% of the GSS+ category.

Figure 3: Green Bond Issuances in India by Value & Volume (in US\$ Mn)



Source: Climate Bond Initiative Database.

The sovereign sector has issued the largest portion, amounting to approximately \$ 7.5 billion (about 23%). Initially, green bonds were primarily issued by renewable energy companies, banks, and NBFCS. However, green bonds are now issued by other industries such as municipalities and the public transportation sector. In recent years, several Indian municipal corporations, such as Rajkot, Surat, Coimbatore, and Pimpri-Chinchwad, have issued green bonds successfully.

Distinction between Sovereign Green Bond and Corporate Green Bonds

For a sovereign issuer, theoretically, there is no difference between a conventional bond and a green bond, as both involve the same credit risk. This differs from corporate bonds, where credit risk may vary. Bond investors don't distinguish between a Sovereign green bond and a conventional sovereign bond, as the issuer remains the same. While investors may differentiate between corporate green bonds based on transition risk and physical risk, the premium has been diminishing over the last couple of years.

Nonetheless, the issuance of a sovereign green bond conveys a message to the market that India is committed to greening the economy and potentially establishing a green bond yield curve, which holds significance for investors. Beyond this signalling effect, sovereign green bonds enhance government accountability for the use of proceeds and reinforce policy credibility in relation to climate action.

The annual share of the top five issuers continued to come down for the third consecutive year, indicating wider participation. In terms of bond structure, notes of a medium tenor (5 to 10 years) dominated, but bonds with shorter tenors rose in prominence from 2019. Bonds with a fixed maturity date are most common, but several issuers of bonds with call options reflect the confidence of green borrowers for a further decrease in the cost of green bonds. Public Sector Units (PSUs), including IREDA, NHPC, and NTPC, are more conservative in their green bond structures with a strong preference for medium tenors, fixed maturity, and fixed coupon rates. In contrast, private firms have issued zero-coupon bonds, written call options, and linked coupon rates to lending rates or other external benchmarks. Refinancing has been the most common use of proceeds since 2019, and bonds for general corporate purposes are becoming increasingly common.

In 2023, the Securities and Exchange Board of India (SEBI) established guidelines for green bonds to ensure transparency and integrity in the market. These guidelines standardise what qualifies as a green project, thereby enhancing investor confidence. Another significant enhancement in the SEBI guidelines is the requirement to appoint an independent third-party reviewer/ certifier for both pre- and post-green bond issuance.

Key challenges

In developing economies with emerging green bond markets, a significant barrier arises from a lack of awareness about the advantages of green bonds. It is essential to inform investors about the financial returns and environmental benefits associated with green bonds to capitalise on available opportunities. This challenges collectively lead to lower investor engagement in green finance projects within developing economies.

Challenges stemming from rigorous green bond certification processes pose obstacles for borrowers, particularly in meeting stringent requirements for project verification and adhering to environmental standards, especially in resource-constrained contexts within developing economies. Greenwashing is a key concern – for example, firms may issue green bonds to appear sustainable without making any actual changes. Some studies suggest that there may be no significant link between the issuance of green bonds and CO₂ reduction of the issuer of green bonds.

➔ Way forward

India's green bond market presents a significant opportunity for sustainable investment, fueled by the country's ambitious climate targets and strong economic growth. As the capital market plays a critical role in mobilising capital for the economy, the bond market is going to be an important source of debt financing for India's corporates looking to invest in green sectors. The bond market will be a key source of debt financing for long-life, low-carbon technologies, including renewable energy, clean transportation, and the industrial sector. Corporations can raise long-term debt capital for a long period to avoid refinancing risk and possibly at a lower rate compared to bank financing. Here, green bonds will be suitable financial instruments for funding green projects, which can significantly mitigate the risk of greenwashing.

🔍 5.2 Transition Bonds

Transition bonds are emerging as a crucial financial tool for decarbonising industries that are traditionally challenging to transition to low-carbon models, such as steel, cement, and other heavy industries. These bonds provide a pathway for companies in high-emission sectors to fund projects that reduce their carbon footprint, without requiring the strict criteria typically associated with traditional sustainable finance instruments, such as green bonds. It enables firms that would not qualify to issue green bonds to obtain sustainable-related financing. Similar to green bonds, a set of principles also exists for transition bonds.

Unlike green bonds, transition bonds don't require the project or issuer to be classified as "green". Instead, the funds must be used for activities that support the issuer's climate transition—positioned between green and sustainability-linked bonds, transition bonds direct financing towards specific projects, similar to green bonds. However, like sustainability-linked bonds, issuers may not yet operate sustainably but are in the process of reducing carbon emissions, such as a fossil fuel company aiming to lower its environmental impact.

Transition bonds remain a small fraction of the sustainable bond market, representing less than 1%¹⁹ of the total global outstanding sustainable bond market. The global market for these instruments is still in its early stages but has been growing, especially in Asia.

Energy companies have historically been the largest issuers of climate transition bonds. However, since the first transition bond was issued in 2019, the total issuance is less than \$ 15 billion. Japan's issuance of its largest-ever sovereign transition bond, valued at US \$ 11 billion,²⁰ and developments in China and ASEAN to expand the transition finance ecosystem, have reignited the discussion around the usability of transition bonds as a viable instrument for financing industrial decarbonization in Asia.

Case Study: Japan's Climate Transition Bonds

In February 2024, Japan issued the world's first sovereign transition bonds, known as Japan Climate Transition Bonds (JCTBs), totalling approximately ¥ 1.6 trillion (approximately \$ 11 billion). This issuance comprised two tranches of ¥ 800 billion each, with maturities of 5 and 10 years, respectively.

The JCTBs are a cornerstone of Japan's Green Transformation (GX) initiative,²¹ which aims to mobilise ¥ 150 trillion in public and private investments over the next decade to achieve carbon neutrality by 2050. Proceeds from the bonds are allocated to a range of projects, including research and development in emerging technologies like hydrogen utilisation in steelmaking.

The bonds are certified by the Climate Bonds Initiative, ensuring alignment with international best practices for climate-related investments. Despite concerns from some international investors regarding the "greenness"²² of the bonds, the issuance was a significant step in expanding the sustainable finance market, particularly for industries that are traditionally difficult to decarbonise.

Current status in India

Transition bonds are yet to be issued by an entity in India.²³ Currently, the financing landscape in India is skewed towards sectors focused on mitigation, including renewable energy proliferation and transportation, which have primarily been financed through green bonds within the sustainable finance market.

Opportunities for transition bonds in India

India is preparing to launch its first transition bonds, designed to promote decarbonization in challenging sectors such as cement and steel. The International Financial Services Centres Authority (IFSCA) established a framework for issuing these bonds. Additionally, as part of this year's union budget announcement,²⁴ it was announced that there are plans for the development of a roadmap to shift "hard-to abate" industries from energy efficiency goals to emission reduction targets.

Industries such as iron, steel, cement, and aluminium, which are responsible for 21% of India's total emissions,²⁵ will require substantial investments in technology and process modifications to achieve low-carbon production. Transition bonds offer a significant opportunity to finance the decarbonization efforts in these high-emission sectors. Transition bonds offer an opportunity for corporates in these sectors to finance transitional assets that will assist in their decarbonization through raising patient capital from global institutional investors. For investors, transition bonds offer an opportunity to provide additional capital by helping high-carbon activities decarbonise, which may be lacking in the case of other thematic instruments, such as green bonds, which have been used in India primarily to refinance existing debt and invest in green assets.

With India's announcement to create a compliance market for carbon trading and the draft greenhouse gas emission intensity targets for a few high-emitting industries,²⁶ regulatory signals for decarbonization are strengthening. Coupled with global developments such as the European Union's Carbon Border Adjustment Mechanism (CBAM), these regulatory and market-based nudges are encouraging corporates in hard-to-abate sectors to invest in low-carbon technologies to reduce their emissions.

Unlike green bonds, which may limit financing for decarbonization to green assets and economic activities, transition bonds provide a capital market mechanism to also finance assets that support incremental decarbonization.

Additionally, for domestic banks, which have conventionally been the largest providers of debt capital to the industrial sector, there are a few factors that impede large-scale lending to the sector. Firstly, there is a lack of sophistication in appraising transitional assets. Secondly, the long duration of debt capital required to invest in these assets may not be available with most domestic banking institutions, and thirdly, sectoral limits imposed by the banking sector regulator may make it difficult for banks to lend more to industrial sectors. Hence, transition bonds offer a viable alternative for corporations to finance their transition through capital market.

➔ Challenges

There are concerns globally that transition bonds could be used as a tool for "transition washing," a form of greenwashing where companies exaggerate or misrepresent their environmental progress or goals. To prevent this and build trust in the market for transition bonds in India, several key elements are currently under development.

Firstly, a well-defined and widely accepted criterion for eligible transition bond projects, which essentially comes from a transition taxonomy, needs to be developed. Japan, for instance, has issued a specific transition taxonomy that lists technical screening criteria to define which assets and economic activities can be considered transitional. Similarly, the European Union taxonomy defines green transitional activities, and ASEAN's traffic light approach also accommodates transition activities.

India recently published a draft framework²⁷ for its climate finance taxonomy for public consultation. The taxonomy will encompass technologies, measures, projects, and activities aligned with climate mitigation, climate adaptation, and the transition of hard-to-abate sectors. Transition-related activities will be guided by one of the taxonomy's eight core principles, support for transition activities, which is designed to enable investments in critical sectors during their transition phase.

The taxonomy, once finalised, will help global investors understand the country's level of ambition in defining transitional assets, especially in hard-to-abate sectors. This will help benchmark it against internal standards or other global taxonomy standards, aiding in investor decision-making.

Secondly, linking the transition bond issuance framework to the corporation's broader transition strategy is crucial. Corporate financing would be ideal compared to project financing, as financing a particular equipment/machinery/process is technically challenging, as it can't be detached from the plant. The International Capital Market Association (ICMA)²⁸ considers establishing a strategy to address climate change-related issues a prerequisite for issuing sustainable finance instruments with "transition" elements. Best practice is to include this information in a dedicated, public transition plan, which should align with market guidance and ideally, the disclosures should be referenced in the transition bond framework and offering documentation. Several voluntary and regulatory developments, including the International Sustainability Standards Board (ISSB) standards, have incorporated these elements related to climate transition plan disclosure.

India's Business Reporting and Sustainability Reporting (BRSR) standards, although not currently requiring explicit climate transition plan disclosures, have several elements that align with an ideal transition plan disclosure framework, particularly the Transition Plan Taskforce (TPT) framework of the UK. Additionally, the capital market regulator, SEBI, requires additional compliance measures for the issuance of transition bonds as part of its green debt issuance framework, which includes disclosing transition plans for specific projects being funded through the transition bonds. With the accelerating adoption of ISSB standards globally, there is an expectation that harmonisation of BRSR with ISSB will also lead to transition plan disclosure requirements in India. Globally, CDP reports that less than 1 per cent of entities²⁹ reporting to it have credible transition plans in place. Hence, globally, this field is also evolving.

Way forward

As India advances in all three aspects mentioned above, it will lead to the creation of a robust domestic ecosystem for the issuance of transition bonds. This should lead to the de-risking of energy transition investments in India by reducing the risk of greenwashing from the issuance of transition bonds. Currently, investors will have to navigate across individual company BRSR disclosures and other disclosures to assess alignment with global guidance on transition plans and their own internal metrics.

5.3 Green/Transition Loans

Green loans are financial instruments provided by lenders, primarily commercial banks and private creditors (e.g., NBFCs, AIFs), for green projects (e.g., renewable energy and clean transportation). They can take the form of credit lines or letters of credit. Green loans adhere to the same four core components as green bonds, as outlined by the International Capital Market Association (ICMA).³⁰ While green bonds are securities traded in the secondary market, green loans are direct transactions between one or more lenders and a borrower.

A transition loan, another sustainable debt instrument, is a use-of-proceeds loan primarily targeting hard-to-abate industries (e.g., steel, cement), where rapid carbon emission reduction is challenging. While definitions of transition finance vary across jurisdictions, global efforts are underway to standardise the definition of transition loans.

Green Bond Vs Green Loan and Transition Bond vs. Transition Loan

Unlike green bonds, green loans offer issuers greater flexibility, allowing for small transaction size loans, lower issuance costs, quicker access to funds, and maintenance of confidentiality and banking relationships. Green loans are more suitable for banks, NBFCs, and AIFs seeking low-cost options that wish to avoid the transaction costs and minimum size requirements typically associated with green bonds.

While green loans are well-suited for sectors with projects that deliver immediate and clear environmental benefits, transition loans are ideal for carbon-intensive industries with significant environmental impacts that are making gradual improvements, such as the steel, cement, aviation, shipping, maritime, and utilities sectors. Green and transition loans provide a more accessible financing option for Micro, Small, and Medium Enterprises (MSMEs) to adopt cleaner technologies and improve their operational efficiencies.

Green loans and transition loans lag behind green bonds and transition bonds in terms of success. As of 2024, global cumulative green loan issuance totalled around \$ 695 billion, compared to \$ 3.7 trillion in global cumulative green bond issuance. Similarly, as of 2024, global cumulative transition loan issuance was only \$ 3 billion compared to global cumulative transition bond issuance of \$ 39 billion.³¹

While green and transition loans currently have a small global footprint, they hold significant potential to drive sustainable debt capital. Banks are increasingly using these instruments to transition their lending portfolios, capitalize on new lending opportunities, and manage climate related risks. This shift is further supported by regulatory pressure from central banks to mitigate climate risks and government mandates to accelerate loan funding for green projects.

In India, the green loan market as of 2024 stands at around \$ 19 billion, while no transition loans have been issued.³² Commercial banks and Non-Banking Financial Companies (NBFCs) are the primary debt financiers in India's debt market. While the corporate bond market is vibrant, valued at approximately \$ 550 billion.³³ Most issuers are banks and financial institutions. Non-corporations will continue to rely on banks and NBFCs for their debt financing needs. Banks and NBFCs can issue transition or green bonds in the capital market and proceed can be used as transition or green loans

Historically, banks and NBFCs have dominated power sector funding in India and are expected to continue to do so in the foreseeable future. In this context, green loans targeting the clean electricity sector will find traction. Besides, there are lending opportunities in green building, energy efficiency, and clean transportation, where banks and NBFCs can also provide green loans.

Investors can participate as co-lenders alongside banks and NBFCs to capitalise on these opportunities. Another option is to invest in new-age clean energy NBFCs set up by entrepreneurs. Investors can also establish new Alternative Investment Funds (AIFs) or invest in existing AIFs that focus on India's clean energy sector.

India's industrial sector (e.g., steel, cement, chemicals, etc.) accounts for 21% of GHG emissions and is under pressure to decarbonize. Investment opportunities in this area include green hydrogen, energy efficiency, and electrification of machinery and equipment. As corporations in these industries may not be able to utilize green bonds or loans, transition loans present a better option for raising capital. This creates a significant lending opportunity for transition loans.

Recent developments

In April 2023, the Reserve Bank of India (RBI) published a Framework for Acceptance of Green Deposits, encouraging banks and NBFCs to offer green deposits.³⁴ The RBI could also issue guidelines for transition loans, drawing cues from SEBI, which could also apply to green loans. Additionally, a taxonomy for climate finance is also expected to be developed,³⁵ which will support the development of a green loan market in the country. In July 2024, India's Finance Minister, as part of Budget 2024-2025, announced a provision of INR 350 billion (\$ 4.2 billion) for the net-zero transition and highlighted the need for a roadmap for "moving the hard-to-abate industries from energy efficiency targets to emissions targets". The International Financial Services Centres Authority (IFSCA) also released a report on transition finance, signalling that India plans to more vigorously open the market to foreign investors seeking lending and investment opportunities in the green sector.

These initiatives are expected to enhance the green and transition loan market by providing financial incentives and regulatory support to promote and monetize emission reduction efforts.

➔ Challenges to green and transition loans

Scaling green and transition loans in India faces several challenges, particularly in financing the transition of hard-to-abate sectors, such as industries and buildings, which lack a clear, well-defined approach compared to financing green technologies. The absence of a standardised definition of green and transition finance adds further complexity, creating confusion about what comprises a credible transition. This lack of alignment can lead to greenwashing, where borrowers may misrepresent their environmental commitments, potentially undermining the integrity of the entire green finance ecosystem. The limited availability of environmental performance data and inconsistencies in sustainability disclosures further complicate the measurement and verification of the impact of green and transition loans.

Additionally, there are no additional benefits for borrowers seeking to raise capital through green or transition loans. While some green loans may offer lower interest rates or other incentives based on market demand, these benefits are inconsistent and can even result in higher costs, making them difficult to quantify. These complexities are further compounded in India by the absence of clear regulatory guidance and inadequate incentives for green and transition loans, making it difficult for lenders to price and structure such loans, particularly in hard-to-abate sectors.

➔ Policy and regulations required to support its growth

Developing a clear taxonomy for climate finance, as indicated, will provide much-needed clarity on what qualifies as green or transition-related investments, reducing ambiguity and helping to prevent greenwashing. Recent efforts, such as offering incentivized sub-limits for green loans or creating separate tranches for green loans,³⁶ have begun to address pricing uncertainties. However, clear, consistent pricing mechanisms remain underdeveloped, especially in emerging markets like India. Establishing a clear roadmap and incentives for hard-to-abate industries can drive substantial investment into green and transition finance.

In terms of investment potential, the green and transition finance market in India holds promise, given the government's commitment and evolving regulatory landscape. However, realising this potential will depend on the swift implementation of these policies and the development of standardised frameworks that make investment opportunities attractive.

5.4 Sustainability-Linked Bonds (SLBs)

Introduction

Sustainability-linked bonds are a forward-looking performance-based instrument, which is different from the focus on the 'use of proceeds' with a pre-defined end objective. For example, unlike green bonds, where the 'use of proceeds' is ring-fenced for green purposes, the funds raised through SLBs used for general corporate purposes or other purposes.³⁷

The key difference between SLB and other popular sustainable finance instruments, such as Green Bonds, lies in their targeted sectors. SLBs, especially (though not exclusively), cater to segments that find it difficult to raise finance to better prepare for fighting climate change and mitigate transition risks. Typically, these industries are high-polluting, including utilities, steel, energy, cement, and construction. The financial characteristics of the bond depend on whether the issuer achieves two predefined sustainability objectives:

1. Measured through predefined Key Performance Indicators (KPI), and
2. Assessed against predefined Sustainability Performance Targets (SPT).

The key principle which separates SLBs from other similar instruments is a step-up coupon if the KPI is not satisfied, which incentivises borrowers to meet pre-defined KPIs. According to the International Capital Market Association (ICMA), in the case of SLBs, bond issuers are explicitly committing to future improvements in sustainability outcomes within a predefined timeline.

Global market³⁸

A cumulative \$ 332 bn of SLBs have been issued. Volumes surged in 2021 as markets recovered post-COVID and interest in SLBs spiked, but issuance dropped afterwards. Non-financial corporates dominate (about 85% of the cumulative amount), but public sector entities have started to access the market. In 2022, two countries issued sovereign SLBs: Chile and Uruguay. The top issuer domiciles are Italy (\$ 49.5 bn, 63% from Enel), France (\$ 28.7 bn), and Germany (\$ 23.0 bn). China is fourth (\$ 21.7 bn) but first by bond count (127) and number of issuers (86). The top three sectors with 41% of the total issued amount are: utilities (\$ 51.1 bn, 61% from Enel), industrials (\$ 39.6 bn), and agriculture & food (\$ 24.2 bn). So far, the more popular currency for SLB issuance is still \$, with a duration of around ten years.

Current status and opportunities in India

Companies in the power and hard-to-decarbonise industries, including JSW Steel, Ultratech Cement, and Adani Electricity Mumbai, have issued SLBs; all these bonds are issued abroad and denominated in US Dollars. The absence of guidelines by SEBI and the lack of incentives for the issuance of SLBs could have restricted companies from issuing securities in India.

ISSUER	SECTOR	ISSUE SIZE	ISSUANCE	KEY TARGETS
UltraTech Cement	Cement	US \$ 400 million	February 2021	Reduce carbon emissions by 22.2% for every ton of cementitious material by March 31, 2030, compared to the levels in March 2017. ³⁹
Adani Electricity Mumbai Limited (AEML), a part of Adani Transmission Ltd	Utilities	US \$ 300 million	July 2021	Contribute to UN Sustainable Development Goals SDG 7 (Affordable Clean Energy), SDG 11 (Sustainable Cities and Communities), and SDG 13 (Climate Change). ⁴⁰
JSW Steel	Metals and Mining	US \$ 1 billion	September 2021	CO2 emissions intensity reduction ⁴¹ to equal or less than 1.95 tonnes CO2 per tonne of crude steel produced (tCO2/tcs), equivalent to a decrease of 23% from a 2020 baseline, by 2030. ⁴²
Tata Cleantech Capital	Private Financial Institution	US \$ 50 million	March 2023	Lending towards renewable energy projects and diversifying into energy efficiency and e-mobility sectors. ⁴³
Grasim Industries	Industrial Conglomerate	US \$ 150 million	March 2024	Decarbonization drive through the increased adoption of renewable energy and water recycling in the paint manufacturing process. ⁴⁴
MindSPACE Business Parks REIT	Real Estate Investment-trust	US \$ 75 million	June 2024	Reduction in greenhouse gas emissions (Scope 1, 2, and 3), increasing the share of green-certified areas for existing buildings, and reduction in energy intensity. ⁴⁵

As India will take a long time to transition completely from thermal power plants to renewable energy, several coal-based power plants need to be upgraded and refurbished to become less carbon-intensive. They may retire coal plants earlier than planned and repurpose them for use in renewable energy plants. Power companies could utilise SLB as a crucial and pragmatic option to finance the repurposing and transition of these coal-fired power plants into less polluting units. SLBs may also be beneficial for several other high-polluting sectors, including steel, energy, cement, infrastructure, and real estate.

Companies with stable balance sheets and credible plans for making progress toward a more sustainable business model may also consider issuing SLBs to meet their long-term funding requirements. SLBs are also suitable for companies that transition their businesses towards less carbon-intensive ones, as they have a positive impact on society.

➔ Challenges

While the market for sustainability-linked bonds in India has seen some activity, it also faces several key challenges. SLBs are not attractive enough for borrowers with very thin spreads vis-à-vis conventional bonds. Hence, there is insufficient incentive for issuers to issue. There are greenwashing risks associated with SLBs as the issuer sets KPIs that are easy to achieve and could be achieved under a business-as-usual scenario. In some cases, companies issued SLBs even though their transition plans were not aligned with the net-zero transition pathway.

➔ What can be done to support SLBs

With further refinement in design, disclosure, favourable regulations, and an enabling environment, SLBs can mobilise massive amounts of capital for the industrial sector, which can significantly reduce carbon emissions over a long period of time.

➔ 5.5 Impact Bonds

Impact bonds, a category of impact investment, refer to a specific form of outcome-based investment where upfront capital is provided by investors to fund programs that create positive social or environmental impact and traditional financial returns. The service provider implements the program, aiming to achieve specific outcomes. If the predetermined outcomes are met, the outcome payer (usually a government or philanthropic organisation) reimburses the investor with a return, ensuring performance-driven social impact.

Currently, over 300 impact bonds have been issued worldwide, raising more than US \$ 868 million, and servicing more than 3.1 million users.⁴⁶ The most prominent sectors for impact bonds include those that were traditionally deemed unbankable, like employment and skills, healthcare, and education, which collectively account for more than 50% of the total impact bonds issued.

Most impact bonds are clustered in high-income countries, with the United Kingdom leading, followed by the United States and France. Conversely, low-and middle-income countries, including India, have far fewer impact bonds. However, there is a positive trend, with an increasing number of new impact bonds being launched in lower-middle-income countries, thereby narrowing this gap.

India's journey with impact bonds began in 2015 with the world's first Development Impact Bond (DIB), focusing on educational outcomes. To date, India has launched five impact bonds, of which three have been completed, and has four upcoming bonds in their development stages.

➔ Opportunities in India

Financing social initiatives is essential for India to meet its Sustainable Development Goals (SDGs) by 2030. According to the Sustainable Development Report 2024, India ranks 109th globally, with only 30% of SDG targets on track. According to the India Philanthropy Report 2025⁴⁷, the country's social sector spending in FY24 was INR 25 lakh crore (~US \$ 300 billion), approximately INR 14 lakh crore (US \$ 170 billion) short of NITI Aayog's estimates. This shortfall is projected to rise to INR 16 lakh crore by FY29, demonstrating the country's significant social sector funding gap. Impact bonds can help bridge this gap by attracting private investment to fund critical social programs, with payments tied to measurable outcomes.

Further, impact investing in India has grown rapidly, with over US \$ 14 billion deployed from 2019-2021 and between 2010 and 2021, the Indian blended finance market grew at a CAGR of ~23%. This growth is driven by the increasing demand for investments that not only offer financial returns but also generate measurable social outcomes. Impact bonds make up only 6.7% of the blended finance market, hindered by complex structures and limited awareness. However, they present significant promise, as they offer structured financial returns linked to the achievement of specific social outcomes and diverse investment opportunities across sectors such as healthcare, education, and renewable energy.

India's evolving Corporate Social Responsibility (CSR) landscape adds another layer of opportunity for impact bonds, considering their potential to act as outcome payers. A notable example is the Haryana Early Literacy Outcomes 'Pay for Success' programme, launched in 2019, which was the first returns-based finance to use CSR funding in India.

Philanthropic capital also holds significant potential, with contributions by UHNIs expected to increase at a CAGR of 22-24% from FY 2024 to FY 2029. As philanthropy in India grows, it is playing a critical role in addressing social challenges that government funding may not fully cover, presenting an opportunity for impact bonds.

Several key sectors are primed for the application of impact bonds, including Agriculture and Rural Development, Renewable Energy and Climate Change, Housing, Financial Inclusion, and Nutrition and Food Security. These sectors align with both India's developmental priorities and the global SDG framework, providing ample opportunities to scale impact.

➔ Challenges for impact bonds

Impact bonds in India face significant challenges due to their complex structure and the country's socio-economic diversity. These bonds involve multiple stakeholders, including investors, service providers, and outcome funders, requiring extensive negotiations, precise outcome measurement, and alignment of interests. The process is resource-intensive and time-consuming, with significant legal and administrative costs. For example, the 2015 Utkrish Impact Bond for maternal healthcare in Rajasthan encountered delays in defining outcome metrics and concerns over using untested standards, taking nearly three years from concept to implementation.

The regulatory landscape for impact bonds in India is in the early stages of development, largely guided by existing frameworks for social enterprises and contractual agreements rather than specific impact bond regulations. This regulatory gap creates challenges related to compliance, taxation, and stakeholder roles. While there are no specific regulations for impact bonds, India's regulatory environment is gradually evolving. The Securities and Exchange Board of India (SEBI) has set up the Social Stock Exchange for listing social enterprises, but it doesn't yet cater to impact bonds.

Another challenge is the lack of standardized metrics for tracking social outcomes across different regions and sectors. For instance, measuring improvements in maternal health or education consistently across India's diverse states with varying infrastructure is difficult. This makes it challenging to ensure comparability of outcomes, which delays evaluations and payments.

Limited government participation is also a significant barrier. Unlike the United Kingdom, where over 95% of impact bonds involve government as outcome funders, India has seen minimal involvement. The Skill India Impact Bond is one of the few examples of active government participation. Without government involvement, scaling these bonds and aligning them with national development goals becomes difficult.

Additionally, there is a lack of investor awareness and engagement. Despite successful projects like the Educate Girls Development Impact Bond, many investors remain unfamiliar with how impact bonds work and their risk-return profiles. This, combined with high transaction costs and insufficient data on returns, further discourages investors from participating in impact bonds, limiting their growth and scalability in India.

➔ Way forward

The impact investment industry in India holds great promise to complement existing government programs and can have a profound impact on millions of consumers and beneficiaries across various development sectors. What's really needed now is better coordination between these different elements and a focus on using innovation to tackle developmental challenges. More government involvement as a regulator and an outcome payer will be key to expanding the impact of these bonds and making sure they are sustainable in the long run.

🔗 Recommendations for a Supportive Regulatory Framework

1. Creation of a Legal Framework:

Introduce specific legislation governing the operation of impact bonds, including taxation, compliance, and outcome measurement.

2. Government Participation:

Encourage more government involvement in impact bonds as outcome funders to boost credibility and scale.

3. National Disclosure Regulations:

Implement comprehensive disclosure norms for sustainability projects to enhance transparency and attract investment.

4. Recognition of Social Enterprises:

Create a separate category for social impact companies with benefits such as eased compliance and tax incentives. In 2019, the Ministry of Corporate Affairs recommended creating a "social impact company" category with eased compliance for businesses committed to measurable social impact and reinvesting a portion of profits into their projects

Source: India Impact Investing Handbook

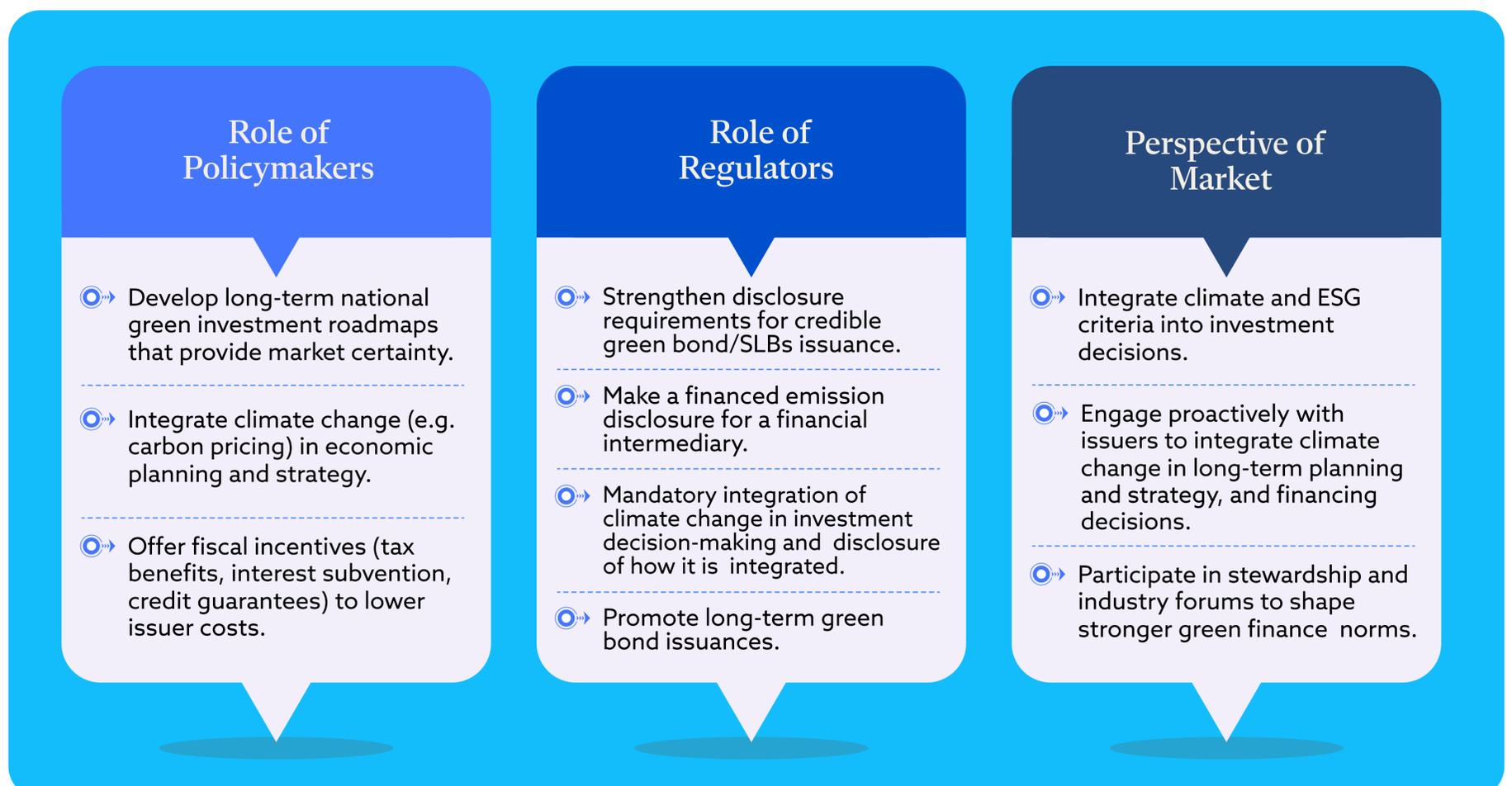
The future of impact bonds in India is bright, but it will depend on the ecosystem's ability to address existing challenges and create a conducive environment for growth. With the right support and strategic alignment, impact bonds could play a crucial role in India's efforts to achieve its Sustainable Development Goals and drive inclusive growth.

06 CONCLUSION AND WAY FORWARD

As outlined in this report, India's need for sustainable finance is large and is expected to grow significantly as public and private players accelerate their efforts in the green transition of the economy. Leading Indian companies have set ambitious targets and are embracing global standards and best practices, which help them raise capital from both domestic and foreign investors. The appetite for sustainable investing among asset owners is likely to grow as investors themselves adopt sustainability goals. Currently, the market is dominated by sovereign issuers and the utilities sector. Sustainability-linked bonds are just getting started, and no transition bond issuances have taken place. However, we can expect quick progress on all these fronts in the coming years. It is also heartening to note the volume of issuances taking place under IFSCA regulations.

India's green and transition bond market can expand meaningfully only if policymakers, regulators, and investors act together. Policy leaders must set clear roadmaps and supportive frameworks, regulators must strengthen standards and market integrity, and investors must commit capital with a long-term sustainability lens. Their combined efforts will be essential to accelerate bond issuance and unlock financing for the country's low-carbon transition.

Figure 4: Driving India's Green/Transition Bond Growth: Policy, Regulatory, and Market Interventions



As we can see, India has made a good start in creating a long-term, sustainable debt ecosystem in the country. These are early days, and much more needs to be done by issuers, investors and regulators. Ultimately, financial markets are built on trust, which in turn requires good governance, and this necessitates reliable data and analysis. At this point, the sustainable debt landscape in India is dominated by a small number of issuers and investors. Both domestic and foreign capital are essential. The participation of long-term domestic asset owners, such as pension funds and insurance companies, will be essential to the success of sustainable debt in India. We need to learn from the experience of other countries, but we also need to identify and solve India-specific issues. This requires research, training and collaboration across a wide range of stakeholders. Through the efforts of our members, CFA Society India aims to be an active participant in this initiative.

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