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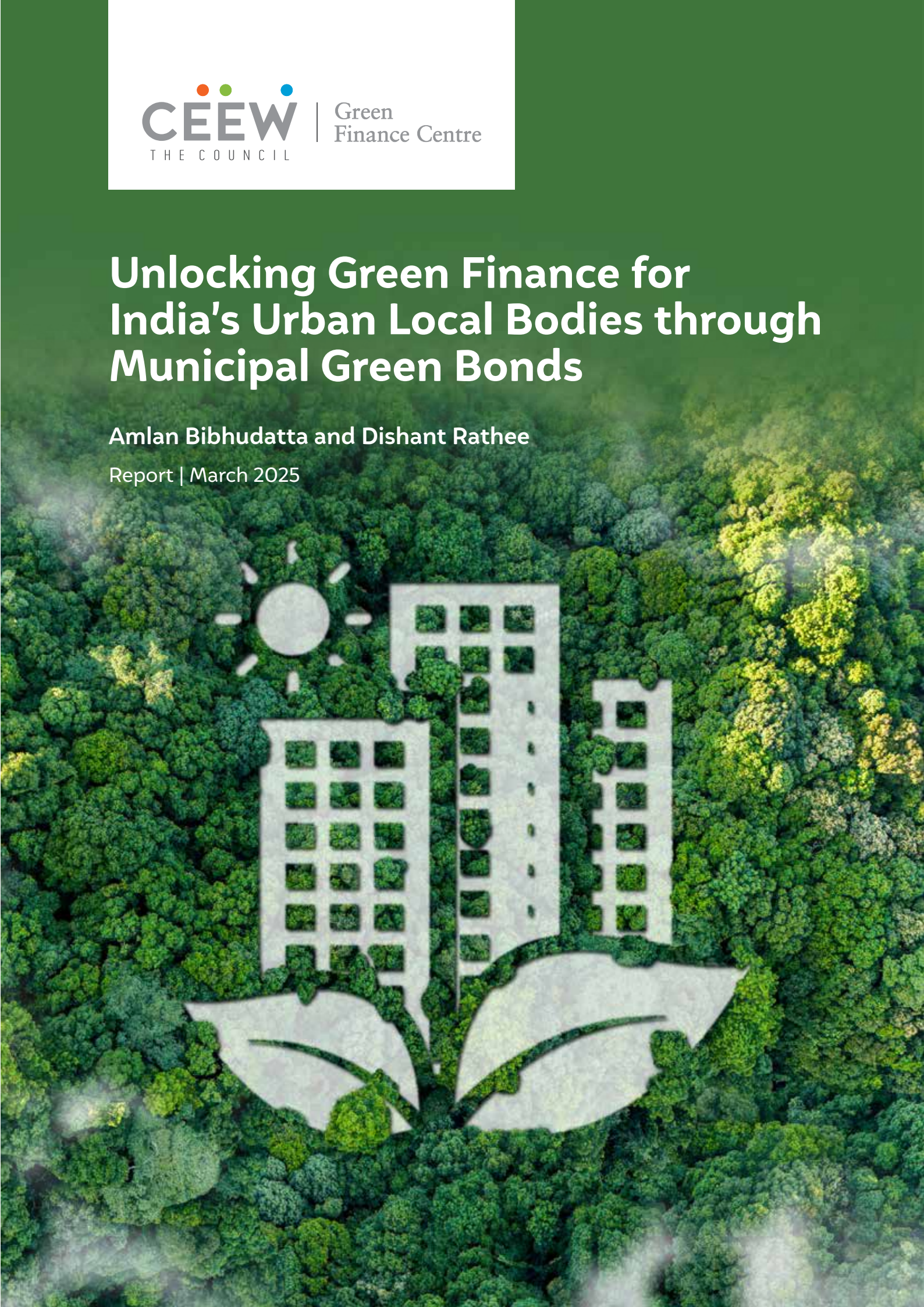
Unlocking Green Finance for India's Urban Local Bodies through Municipal Green Bonds

Amlan Bibhudatta and Dishant Rathee

Report | March 2025



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Urban growth and climate risks demand major investments by ULBs; bond markets are key to mobilising the required finance.

About CEEW-GFC

The CEEW Green Finance Centre (CEEW-GFC) is a special initiative of the Council on Energy, Environment and Water (CEEW), one of Asia's leading think tanks.

CEEW-GFC acts as a non-partisan observer and catalyst that aims to bridge green financing gaps by addressing financing bottlenecks and enhancing the integration of green considerations in financial decision-making. Its approach is multi-pronged: tracking market trends, publishing research and analysis, developing financial solutions, offering technical assistance, and fostering coherence between policymakers, regulators, financial institutions, and industry.

Financing the green transition

India—and other emerging countries—are at different stages in their journey towards a net zero economy. Yet, the challenge of financing this transformation endures. CEEW-GFC estimates that India would need over USD 10 trillion to reach net zero by 2070, with additional investments required for climate adaptation and other environmental imperatives.

While conducive policies and regulations are steering capital flows towards green initiatives, the cost and availability of financing remain critical barriers. Emerging markets, already constrained in mobilising capital for economic development, face even greater hurdles in securing investments for sustainability. Balancing economic growth with a green transition further complicates the challenge, making continuous analysis and engagement essential for a successful transition.

CEEW-GFC's approach

CEEW-GFC is at the forefront of identifying trends, analysing policies, and designing financial solutions across the green financing spectrum. Its work enables:

- Stronger engagement with policymakers and regulators, ensuring a more effective policy environment.
- Innovative financial solutions, tailored to overcome funding gaps.
- Integration of green considerations in financial decision-making.
- Capacity building through training and workshops, nurturing expertise in sustainable finance.

CEEW-GFC evolved from the CEEW Centre for Energy Finance (CEEW-CEF), launched in July 2019 in the presence of H.E. Mr Dharmendra Pradhan and H.E. Dr Fatih Birol.

www.ceew.in/gfc

Municipal bonds, specifically green bonds, present a largely untapped potential of billions of dollars for climate-resilient urban infrastructure.

Image: iStock

Contents

Despite the progress made in the muni bond and muni green bond markets over the last decade, crucial bottlenecks remain.

Image: iStock

Executive summary

It is estimated that over 40 per cent of India's population, or 630 million people, will reside in Indian cities by 2030; this figure will climb to 814 million by 2050. This urban population will need a corresponding scale of civic services. Moreover, with rising threats induced by climate change, enhanced urban climate adaptation plans will be required as well. Significant investments in the order of billions of dollars will be needed on these fronts.

Role of urban local bodies

Urban local bodies (ULBs), comprising the third tier of governance in India, have a crucial role to play in this context, both because of their position within the government and nature of work. ULBs can be classified into three broad categories: municipal corporations (MCs), municipal councils (municipalities), and nagar panchayats. These bodies usually ensure last-mile service delivery of crucial public goods. They also provide a range of civic services that coincide with infrastructure in sectors categorised as green. For example, water supply, sanitation, waste management, urban planning, and amenities.

Financial challenges faced by ULBs

The ability of ULBs to effectively address the increasing pressure on services by a growing population, combined with the need to step up climate adaptation investments, is hampered by certain challenges. These are a need for more financial resources and lack of institutional capacity. The financing challenge can be further broken down into two categories. The first relates to fiscal governance and management, which includes a lack of financial autonomy, outdated accounting standards, and little transparency in reporting credible financial data. The second relates to the state of revenue and expenditure. On the revenue front, this includes a lack of adequate revenue channels, insufficient devolution of revenue sources, and an over-reliance on few revenue sources and grants, coupled with inefficiency in capitalising on existing revenue channels. Meanwhile, a large share of expenditure goes towards administration and wages. Therefore, infrastructure spending is constrained.

Exploring municipal bonds as a solution

With respect to the state of revenue and expenditure, borrowing has historically accounted for a small fraction of ULB receipts. Within borrowings, municipal bonds (muni bonds) have comprised an even smaller share. Among the diverse solutions to the financing challenges faced by ULBs, stepping up the issuance of muni bonds (and their subset of municipal green bonds or 'muni green bonds') is one way to mobilise resources. Muni bonds are generally of two types: revenue-obligation bonds and general-obligation bonds. General-obligation bonds are paid with the overall revenues of ULBs, whereas servicing revenue-obligation bonds is tied to the cash flows of specific projects. Of all the types of ULBs in India, it is predominantly MCs that have been able to tap this market so far, primarily because of their size and suitability.

State of muni bond market in India

Since 1997, there have been 50 muni bond issuances in India, amounting to INR 6,933 crore (~USD 850 million).[1] These issuances have been concentrated in certain geographies, with only 10 MCs accounting for 27 of the 50 issuances. Further, all 50 issuances can be traced to ULBs in just 8 states. The pricing of these issuances varies immensely. There are significant differences in coupon rates even among comparable muni bonds – up to 318 basis points (bps) in certain cases. Additionally, there are considerable differences between the yields of muni bonds, other government bonds like Government Securities (G-Secs), state development loan (SDL) bonds, and those issued by quasi-government institutions, such as public sector undertaking (PSU) bonds. While spreads on SDL and PSU bonds are ~60–70 bps, those on muni bonds are almost 3×, at ~180 bps. Though this may not be a like-for-like comparison, it reflects the nature of muni bond pricing.

Challenges in the muni bond market

Although India's muni bond market has existed since the late 90's, it still remains at an incipient stage of market maturity. Factors impeding its growth have cut across both entity and systemic levels. At a systemic level, they have included political challenges; regulatory

1 All figures at USD 1 = INR 80.

hurdles and inconsistencies; a lacklustre track record; the absence of liquidity in the muni bond market; and the crowding out of bonds through alternative sources of capital expenditure such as grants, state guaranteed loans, and loans by development finance institutions (DFIs). At an entity level, prominent challenges have included a lack of fiscal autonomy; lower than investment-grade credit ratings; an absence of modern financial practices; and a lack of internal capacity to engage with capital markets. All these factors have ultimately contributed to the lacklustre performance of the muni bond market in India.

Promising emergence of muni green bonds

Within the muni bond market, muni green bonds are increasingly gaining traction. Muni green bonds are use of proceeds bonds. This means that capital raised through their issuance needs to be directed towards activities specified as green. The Securities and Exchange Board of India (SEBI) circular on green debt securities provides detailed guidance on which activities may be considered green.

To delve deeper into the evolution of muni green bonds, we narrowed the data set of 50 issuances since 1997 to those since 2015. This resulted in 19 issuances. This set was further reduced to 18 through the exclusion of an outlier. The choice to use 2015 as a cut-off date was dictated by two factors. First, it coincided with the commencement of a period of rejuvenation of the muni bond market following a decade of stagnation. Second, 2015 heralded two critical enablers for the muni bond market. One was the launch of the *Atal Mission for Rejuvenation and Transformation* (AMRUT) scheme, which re-energised a dedicated focus on muni bonds via a credit rating exercise for ULBs and bond-linked incentives for MCs. The second was the release of SEBI's regulations on *Issue and Listing of Municipal Debt Securities* (ILMDS) *Regulations*. In other words, bonds raised before 2015 are incomparable to those raised after because of the changed policy environment.

> "Municipal financing is the way to progress for Indian cities.
>
> *– Ajay Banga, President of the World Bank, "Municipal Financing Way to Progress for Indian Cities," The Indian Express, July 17, 2023.*

Key insights and takeaways

The key findings from our analysis of this data set of 18 issuances (the subset) with an aggregate value of INR 2,864 crore are as follows:

1. **Four of the last seven muni bond issuances, amounting to INR 694 crore (~25 per cent of the subset) were green-labelled,** indicating that muni green bond issuance is on the rise.
2. **Eleven bonds worth INR 1,675 crore (~58 per cent the value of all the bonds) could have been potentially labelled green** (green potential) based on the specified use of proceeds. However, they were not, thus representing missed opportunities.
3. **The potentially labelled green bonds were issued with coupons that had an average spread of 1.60 per cent sovereign yield, versus a much lower spread on the green-labelled ones,** at ~1.11 per cent (by ~50 bps). This indicates that the labelling appears to be associated with a lower cost of borrowing.
4. **Spreads for non-green muni bonds (3 nos) at 2.28 per cent were found to be much higher than both green-labelled (by 117 bps) and potentially labelled green (67 bps)**. This indicates that even in the absence of labelling, the green end-use appears to be associated with a lower cost of borrowing.
5. Combining the findings from points 1 and 2 highlights that ~83 per cent of all bond proceeds in the subset were directed towards green end-use, whether labelled as such or not.
6. Applying this finding to conservative third-party estimates of the cumulative muni bond market potential by CARE Ratings and the World Bank, in general, suggests that **the potential for muni green bonds is USD 2.5–6.9 billion, over different timelines in the next 5–10 years**.

Clearly, policy and regulatory initiatives introduced in 2015 have renewed the outlook on municipal financing. Our analysis suggests that municipal green bonds are fast emerging as a preferred route for municipal financing. We also find that municipal green bond issuances are associated with cost-saving advantages for municipalities. Finally, municipalities are increasingly being incentivised to focus on green themes.

Way forward: The RISE framework

Against this backdrop, how can the emerging segment of muni bonds, including muni green bonds, be catalysed to tackle India's municipal-level financing challenges? At the outset, it is equivocally acknowledged the paltry level of muni green bond issuances to date is in stark contrast to their potential.

Drawing on our analysis of past muni bond issuances, as well as stakeholder interactions, we propose a four-point action plan. RISE (Reform, Identify, Strengthen, Engage) will empower ULBs, particularly MCs, to access muni bond (especially muni green bond) markets more. The action plan is summarised as follows:

- **Reform** financial and accounting practices and own revenue streams.
- **Identify** infrastructure requirements and debt/bond issuance potential.
- **Strengthen** internal capacity in terms of finance and sustainability.
- **Engage** with stakeholders, such as financial intermediaries and public institutions (e.g., government bodies, investors, regulators and DFIs).

1. Introduction

By 2030, an estimated 630 million people, representing more than 40 per cent of the national population, will live in India's cities (PIB 2021). Delivering public services, such as public transport, water, drainage systems, education, and health to this population will require significant investment in infrastructure. The report of the High Powered Expert Committee on Urban Infrastructure, released in March 2011 estimated an average annual financing requirement of USD 42 billion till 2030 (ICRIER 2011). Meanwhile, the World Bank estimates that Indian cities will need to invest USD 840 billion in urban infrastructure and services by 2036 (Athar et al. 2022).

This is not the only challenge in India's urbanisation story. In addition to bolstering civic services, significant investments will be required to ensure that cities adapt to climate change–induced risks, such as heatwaves, floods, and cyclones. These events are particularly pronounced in urban India. According to CEEW (2021), three out of every four Indian districts is an extreme climate event hotspot, affecting ~80 per cent of the population. Moreover, India's adaptation communication to the United Nations Framework Convention on Climate Change (UNFCCC) mentions a requirement of INR 56.68 trillion (~USD 700 billion) for climate adaptation by 2030 (MOEFCC 2023).

In this context, urban local governance has a pivotal role to play. As per the Ministry of Panchayati Raj's (n.d.) Local Government Directory, there are close to 5,000 urban local bodies (ULBs) in India. These are broadly categorised as follows: 253 municipal corporations (MCs) for larger urban areas, 1,907 municipal councils (municipalities) for smaller urban areas, and 2,429 notified area councils (NACs) or Nagar panchayats for transitional urban areas. This classification of ULBs was first institutionalised in the 74th Amendment to the Indian Constitution in 1992. The same amendment included the 12th Schedule of the Indian Constitution, which provides a list of 18 functions for ULBs. These functions are primarily to do with urban planning and the delivery of urban civic services. They include town planning, roads and bridges, water and sanitation, and slum upgradation.

But municipalities in India are plagued by their own challenges. Primary among them are the need for substantially more financial resources and the need for greater institutional capacity. To address these challenges, there is a growing imperative to explore new financing mechanisms. One such promising source of finance is municipal bonds (muni bonds), and their fast-emerging subset, municipal green bonds (muni green bonds). These bonds offer promising avenues for raising capital to fund essential urban infrastructure projects, including those that are part of climate adaptation initiatives.

Currently, the Indian muni bond market is at an early stage of market maturity. A total of 50 bonds worth ~INR 6,900 crore (USD 800 million) have been issued till date, since the first issuance in 1997. The size of India's muni bond market is minuscule when compared to those of several other countries. Still, the GoI has taken proactive steps to catalyse muni bonds in general, and muni green bonds in particular. Key steps include establishing regulatory guidance for both muni bonds and muni green bonds by the Securities and Exchange Board of India (SEBI); conducting facilitation exercises such as credit rating of ULBs by the Ministry of Housing and Urban Affairs (MoHUA); launching the India Municipal Bond Index (IMBX) at the National Stock Exchange (NSE); and instituting direct monetary incentives from the MoHUA under the *Atal Mission for Rejuvenation and Urban Transformation (AMRUT)* scheme. But to develop a vibrant muni bond and muni green bond market in

India, in order to take full advantage of these important instruments, further reforms and interventions are needed.

Against this backdrop, this report evaluates the landscape of municipal financing in India, with a particular look at key challenges. It then outlines major trends in the Indian muni bond market, with a focus on the emergence of muni green bond issuances and their features. This report contributes to the existing literature by investigating **three questions**. **First**, how many muni green bonds have been issued to date in India, and what are their features? **Second**, of the existing issuances, how many (or how much value) could have been labelled as green? **Third**, on average, are muni green bond issuances associated with any pricing advantages over conventional or green-potential muni bonds, and if so by how much? Further, the report outlines the advantages of these bonds and challenges faced by MCs in issuing them. Finally, it proposes a **four-point plan, RISE (Reform, Identify, Strengthen, Engage)**, to facilitate accelerated issuance of muni bonds and muni green bonds.

2. Approach and methodology

This report draws on secondary research, data compilation, and consultations with key stakeholders. These include municipalities, investors, and urban infrastructure experts. Our approach has three key components.

2.1 Review of the literature and compilation of a data set

The initial phase involved an extensive review of the existing literature to gain insight into the current state of municipal finances in India, the evolving muni bond market, and the emerging muni green bond market. This review encompassed academic papers and reports, regulatory documents, and credit rating rationale reports. Sources included but were not limited to various finance commissions (FCs), the Reserve Bank of India (RBI), SEBI, NSE, Credit Rating Information Services of India Limited (CRISIL), G20 reports, and the National Institute of Urban Affairs (NIUA).

Parallelly, a data set of the 50 muni bond issuances in India was created. This cumulative data set was developed by collating information from various sources, including the RBI, NIUA, SEBI, web-based platforms such as City Finance and Munify, and individual municipality websites. It includes information on key bond parameters such as the size of issuance, coupon rate, date of issuance, tenure, use of proceeds, and credit rating. It is a first-of-its-kind public data set of muni bonds in India, because of its comprehensive coverage of issuances and detailed information on these issuances.

2.2 Stakeholder consultation

We reached out to relevant stakeholders for their input and review to refine this report. A diverse set of stakeholders gave us multiple perspectives on all aspects of the market, including supply, demand, and regulation. The primary stakeholders were institutional investors such as insurance funds, relevant executives from MCs such as Chief accounts and finance officers (CAFOs), experts in public finance, debenture trustees, merchant bankers, credit rating agencies, and relevant civil society organisations (CSOs).

2.3 Analysis and results

For the analysis, the cumulative data set was narrowed down to a subset, including all issuances since 2015. This resulted in 19 issuances. This subset was further reduced to 18 through the exclusion of the Andhra Pradesh Capital Region Development Authority (APCRDA) bond for the development of the city of Amravati. This particular bond is not representative of the muni bond market; it is an outlier, specifically in terms of its size. Moreover it was issued in compliance with SEBI's Issue and Listing of Debt Securities Regulations, 2008, not the Issue and Listing of Municipal Debt Securities (ILMDS) Regulations, 2015. The choice to use 2015 as a cutoff year was dictated by two factors. First, it coincided with the commencement of a period of rejuvenation of the muni bond market following a decade of stagnation. Importantly, 2015 heralded two critical enablers for the muni bond market: the launch of the *AMRUT* scheme, which mandated credit rating exercises for MCs, with subsequent monetary incentives for bond issuance; and the release of SEBI's ILMDS Regulations.

Our analysis is based on the three questions mentioned in Section 1. All bonds in the subset were classified, based on their use of proceeds, into three categories:

a) **Green**: The proceeds are used for green activities and the bond is labelled as green.

b) **Green-potential**: The proceeds are used for green activities but the bond is not labelled as green.

c) **Non-green**: Neither are the proceeds green nor is there a green label.

Classification of the bonds was done with reference to the list of green activities under SEBI's ILMDS Regulations. These regulations apply to municipalities as well.

3. ULB financing overview

Municipal finances have remained at the heart of India's widely contested fiscal devolution debate for decades. There are varying views on this topic. Several stress both the vertical and horizontal imbalances in municipal financing. Vertical imbalances are likely to arise due to differing fiscal powers between different levels of government, such as taxation laws. Horizontal imbalances, meanwhile, are more to do with differences in endowments (population and economic base) and capacity. The former is a top–down policy choice, while the latter can partly be attributed to destiny and the ULB's own choices. In short, financial constraints at a municipal level are due to a lack of both necessary fiscal competence and sufficient fiscal regulations.

To more clearly understand the reality, the challenges associated with municipal financing can be clubbed into two categories: the state of fiscal governance and autonomy, and the state of revenue and expenditure.

3.1 Fiscal governance and autonomy

The "State of Municipal Finances in India" report, prepared for the 15th FC, highlights that Indian municipalities are lagging in terms of fiscal governance (management, measurement, and reporting) and autonomy (ICRIER 2019). This adversely affects not just their financial position, but also their general governance and capacity to deliver the required civic services. However, this is not new. Problems such as a lack of financial independence, sound financial management, and financial data and reporting have been identified, along with specific measures and solutions, in previous FCs (PRS 2021). Moreover, the RBI's (2022) "Report on Municipal Finances" points out that the decentralisation of financial powers to ULBs has not accompanied a decentralisation of responsibilities. This has rendered ULBs among the weakest government institutions, particularly in terms of fiscal autonomy.

In this regard, we highlight two fundamental issues pertaining to financial practices and data (NITI Aayog 2023):

a) There is a lack of adherence to standardised accounting practices. A large number of ULBs still use traditional cash-based accounting standards instead of more widely used, modern standards such as accrual accounting.

b) There is a lack of verification and reporting of financial data. In particular, ULBs are failing to conduct timely independent audits of their financial statements and publish statements.

Several reforms have been implemented to address these factors. For instance, on the recommendation of the 11th FC, in 2002, a task force was constituted by the Comptroller and Auditor General (CAG) to recommend accrual accounting to municipalities. This led to the formulation of the National Municipal Accounts Manual (NMAM) in 2004. All state governments were thereon expected to publish their own accounting manuals to align with the NMAM. Since then, grant access conditionalities and prerequisites have been imposed by FCs and state finance commissions (SFCs) to encourage improved financial practices. For instance, the 15th FC recommended making online disclosure of the previous year's accounts, and the audited accounts of the year preceding the previous year, a prerequisite for ULBs to access grants (Finance Commission 2020). Although several strides have been made on the disclosure front recently on account of the FC's recommendation, the two aforementioned fundamental challenges still persist in several ULBs.

3.2 State of revenue and expenditure

As per the RBI (2024), in FY 2023, the cumulative budget (expenditure) of MCs in India stood at INR 3.4 lakh crore (~USD 40 billion), translating to ~1.3 per cent of the gross domestic product (GDP). To put this in perspective, budget of the New York City Council alone was ~USD 100 billion, i.e., more than approximately ~2.5 times the entire cumulative budget of India. Expenditure at the state (17 per cent of the GDP) and centre (15 per cent of the GDP) is significantly higher than among MCs (PRS Legislative Research 2024). Cumulative expenditure of the three levels of government (centre, state, and MCs) in FY20 accounted for 33 per cent of the GDP. Of this 33 per cent, only 1 per cent was spent by MCs, translating to ~3 per cent of the total public expenditure. This figure is much higher in other countries; for example, the United States (US), at ~27 per cent, and China, at ~50 per cent (Kapur 2020). While

some of this could be explained by a greater degree of urbanisation in these countries, a lot of it also has to do with fiscal decentralisation, devolution, and reforms.

Other research on revenue and expenditure trends paints a similar but more nuanced picture of ULB financing.

3.3 Key trends in ULB finances

Before diving into the more significant trends, it is imperative to understand a typical ULB's financial architecture. How do they raise money? How and where do they spend it?

How do ULBs raise money?

ULB revenue can be categorised into three main buckets:

a) **Own revenue**: This is raised through taxes, such as property or professional taxes, and non-tax avenues, such as user fees for civic services, rental income, and fees for registration or licensing.

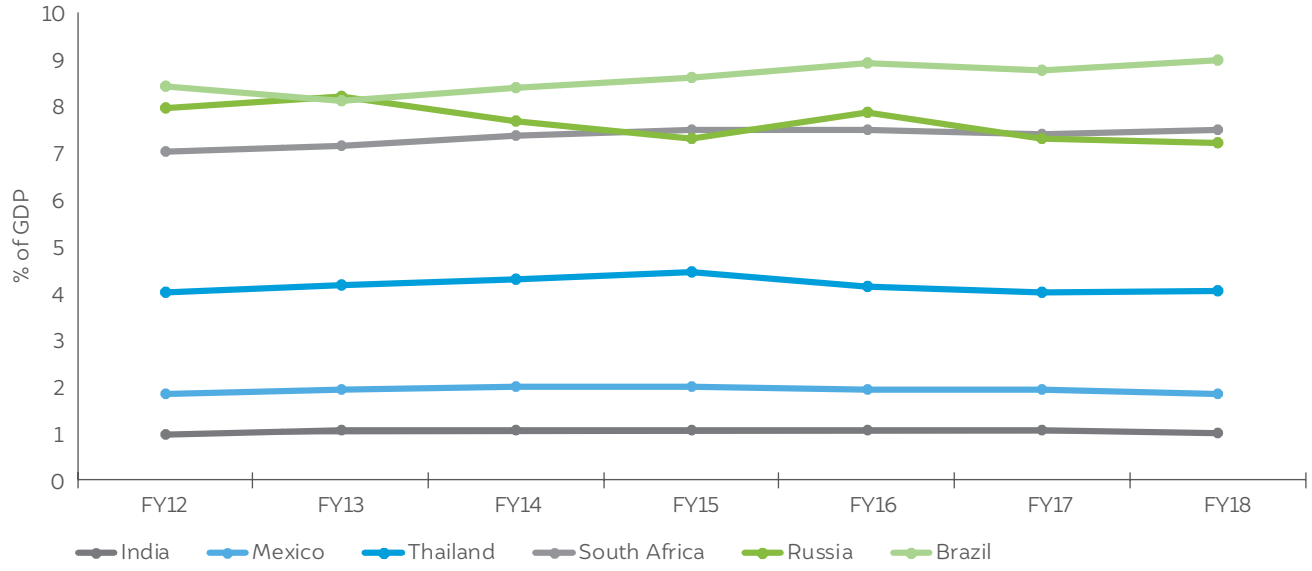
b) **Transfers from the centre and state**: This revenue is received in the form of tax devolutions from the central and state governments, assigned revenues from the state government, and targeted and/or performance-based grants.

c) **Borrowings**: This is the capital raised as debt through loans from banks, financial institutions (especially government institutions), and the bond market.

I. How do Indian ULB revenues compare to those in other countries?

ULB revenues in India are quite low, as a percentage of the GDP, compared to other peer countries. Indeed, the cumulative revenue stagnated at ~1 per cent between FY12 and FY18. In contrast, local governments in Mexico and Thailand generated revenue totalling 2–4 per cent of their GDP in the same period. Meanwhile, those in Brazil, Russia, and South Africa raised 7–9 per cent of their GDP.

Figure 1 India's revenue from ULBs as a percentage of GDP remains lower compared to other economies



Source: CEEW-GFC analysis based on the GFS Database (IMF, 2024) and ICRIER (2019)

Note: 1. The definitions and fiscal powers of ULBs differ across countries, which may explain some part of the divergence in revenue.

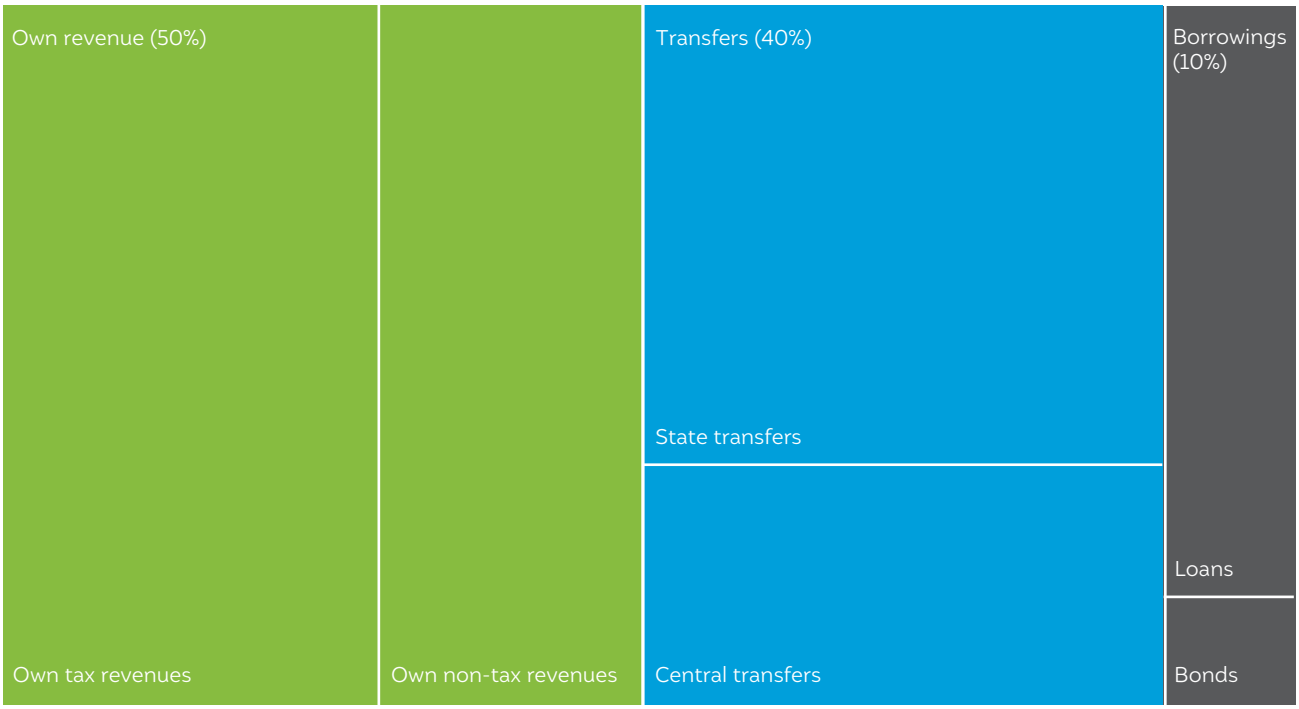
2. Figures correspond to the period between FY12 and FY18.

II. Where are the lags within revenue?

Between FY12 and FY18, on average, ULBs generated around 50 per cent of their total revenues independently. Within their own revenues, reliance on property taxes was particularly high. The second biggest chunk (40 per cent) of ULB revenues came in the form of state and central transfers. Since FY16, reliance on these transfers has increased, whereas the share of own revenue has declined.

Borrowings constituted a meagre ~10 per cent of all ULB revenue. These included term loans from banks; guaranteed loans from public institutions such as the Housing and Urban Development Corporation Ltd (HUDCO) and development financial institutions (DFIs); and loans from the state government. Proceeds from bonds accounted for only ~5 per cent of the borrowings, or 0.5–1 per cent of the cumulative revenue (Athar et al. 2022). Moreover, no muni bonds were issued between FY14 and FY16.

Figure 2 ULB revenue composition highlights dependence on transfers and limited borrowing



Source: CEEW-GFC analysis based on the data compiled by ICRIER (2019)

Note: Figures correspond to the period between FY12 and FY18.

How do ULBs spend money?

ULB expenditure can be categorised into two main buckets:

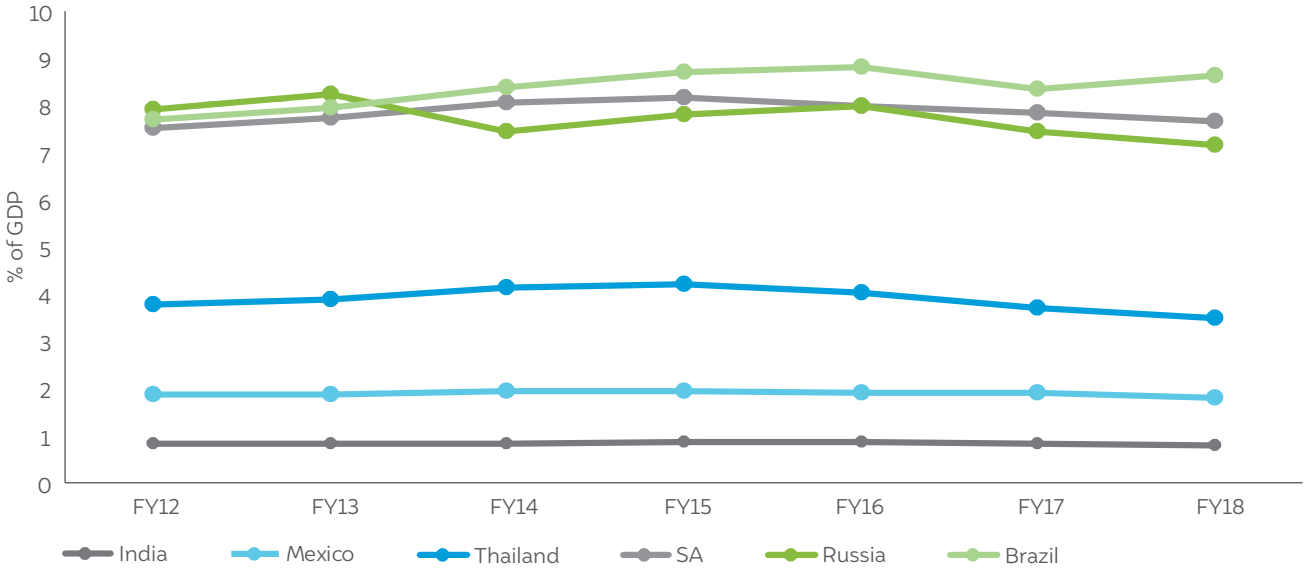
a) **Revenue expenditure**: This includes spending on general ULB expenses, such as salaries and pensions, administration, and operation and maintenance (O&M).

b) **Capital expenditure**: This encompasses spending on building infrastructure or civil works to support the delivery of services in the ULB's jurisdiction. For example, water supply, sewage treatment plants, and roads.

I. How do Indian ULB expenditures compare to those in other countries?

Like ULB revenue, ULB expenditure in India has been quite low as a percentage of the GDP, compared to other peer countries. Cumulative expenditure stagnated at ~1 per cent between FY12 and FY18. In contrast, local governments in Mexico and Thailand spent 2–4 per cent of their GDP in the same period. Meanwhile, those in Brazil, Russia, and South Africa spent 7–9 per cent of their GDP.

Figure 3 India's ULB expenditure as a % of GDP remains low compared to other economies



Source: CEEW-GFC analysis of the GFS Database (IMF) and ICRIER (2019)

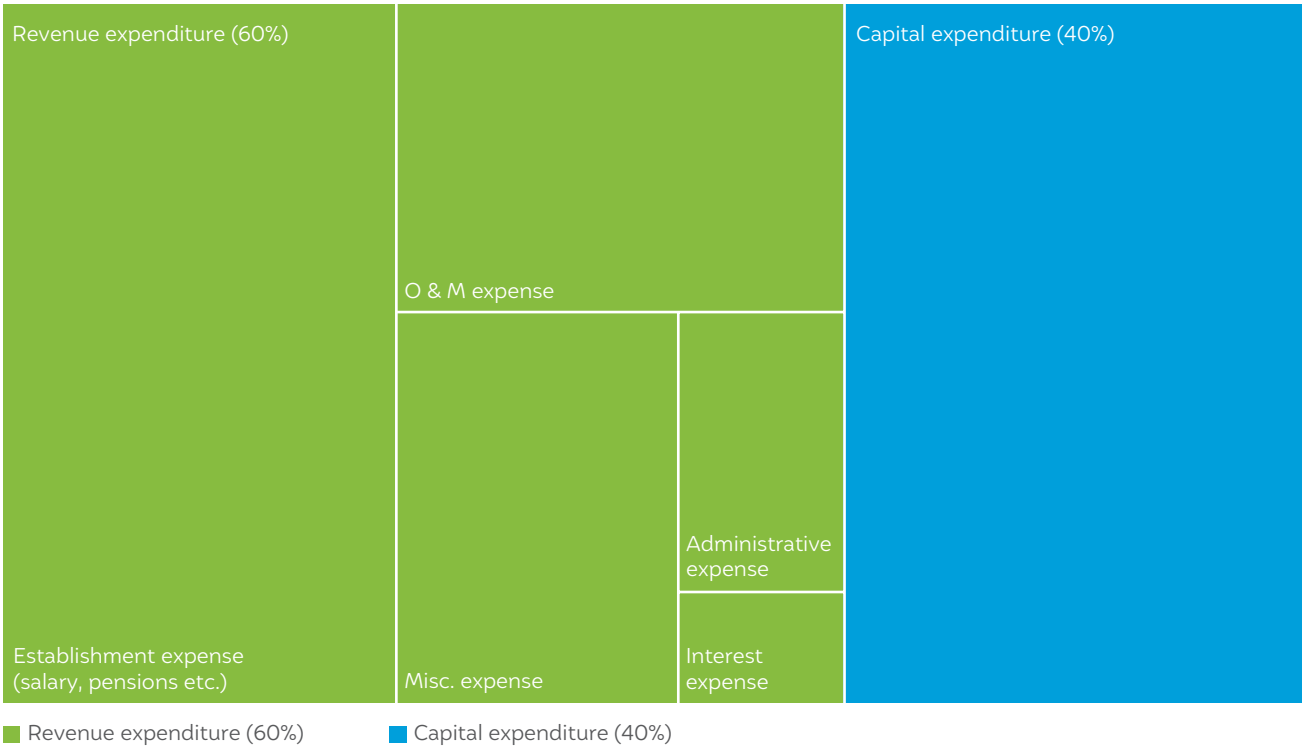
Note: 1. The definitions and fiscal powers of ULBs differ across countries, which may explain some part of the divergence in expenditure
2. Figures correspond to the period between FY12 and FY18

II. Where are the lags within expenditure?

Between FY12 and FY18, there was a greater focus on revenue expenditures, which constituted ~60 per cent of the total expenditures. Investments in infrastructure and other capital projects stayed relatively low, as capital expenditure constituted only ~40 per cent of ULB expenditure in the same period.

In sum, the state of ULB finances in India highlights the need for increasing capital expenditure, with a focus on tapping into the bond market. The following sections provide an overview of the muni bond market, the muni green bond market, the challenges associated with the market, and possible solutions.

Figure 4 Revenue expenditures account for majority ULB spending indicating limited focus on capital projects.



Source: CEEW-GFC analysis based on the data compiled by ICRIER (2019)

Note: Figures correspond to the period between FY12 and FY18

4. India's muni bond market

Municipal bonds (muni bonds) refer to non-convertible debt securities issued by a municipal body or another entity that is established for such purposes and entrusted with functions under Article 243W of the Indian Constitution, e.g., local development authorities or pooled finance bodies. Bonds provide long-term, low-cost, large-scale debt capital that is ideal for infrastructure projects; they are widely used in the private sector for such purposes. In 1996, the Rakesh Mohan Committee was among the first bodies to recommend raising municipal bonds for urban infrastructure development. Following this, the USAID's FIRE-D Project conducted workshops and capacity-building programmes to provide the inaugural push for the muni bond market. The maiden muni bond issuance of INR 125 crore was made by the Bengaluru MC in 1997, with the cushion of a state guarantee. In the following year, Ahmedabad issued its first muni bond worth INR 100 crore, but without a state guarantee (GIZ 2017).

Since then, a total of 48 issuances have been made by 26 entities. This includes individual issuances by MCs, issuances by local development authorities, and pooled issuances via state government bodies.[2] These 50 issuances sum up to a modest cumulative issuance size of ~INR 6,933 crore (USD 850 million), with an average issuance size of ~INR 130 crore. Considering outstanding bonds that are yet to mature, there are currently 15 issuances worth ~INR 2,384 crore (USD 300 million). For reference, the outstanding corporate bond market is well over 2,000× of the muni bond market, at ~INR 47 lakh crore; meanwhile, the outstanding stock of state development loans (SDLs) is well over 2,200× the muni bond market, at ~INR 55 lakh crore (SEBI 2024). Moreover, the Indian Government Securities (G-Sec) Market is currently ~INR 1.1 crore crore, or 4,500×, of the muni bond market (RBI 2024). These numbers suggest that the Indian muni bond market is at an incipient stage of development. There is also evidence on the concentration of issuances in select geographical locations and the pricing of bonds that underlines this lack of market maturity.


Image: iStock

2 Pooled issuances include state-led issuances (e.g., co-offered with water and sewerage boards, state governments) or issuances as part of a larger development fund. The proceeds may go to a group of ULBs.

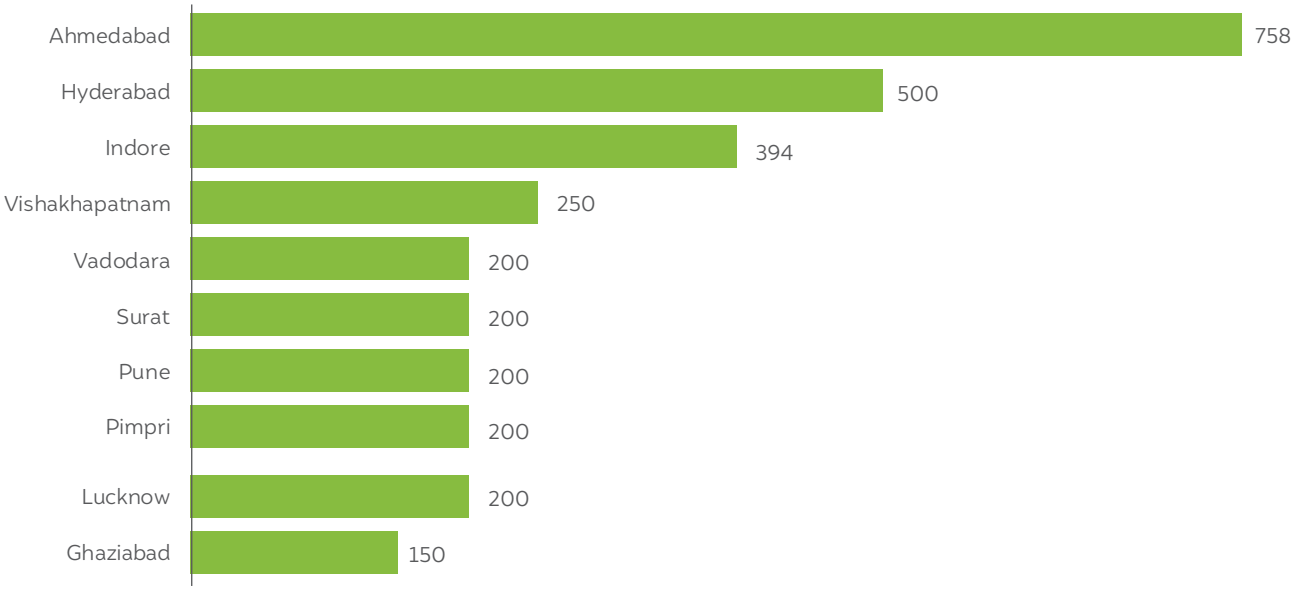
4.1 Issuances are concentrated in select municipal corporations and states

Muni bond issuances are low in both volume and value. Also, only a handful of MCs in select states dominate the market. The majority of MCs and states are yet to make a bond issuance.

Concentration by municipal corporation

The top 10 MCs represent ~75 per cent (in value) and ~70 per cent (in volume) of the muni bond market. At INR 758 crore, the Ahmedabad MC leads the list. Moreover, 235 of the 253 MCs (i.e., 93 per cent) are yet to make a bond issuance.

Figure 5 Municipal bond market remains concentrated among a few cities



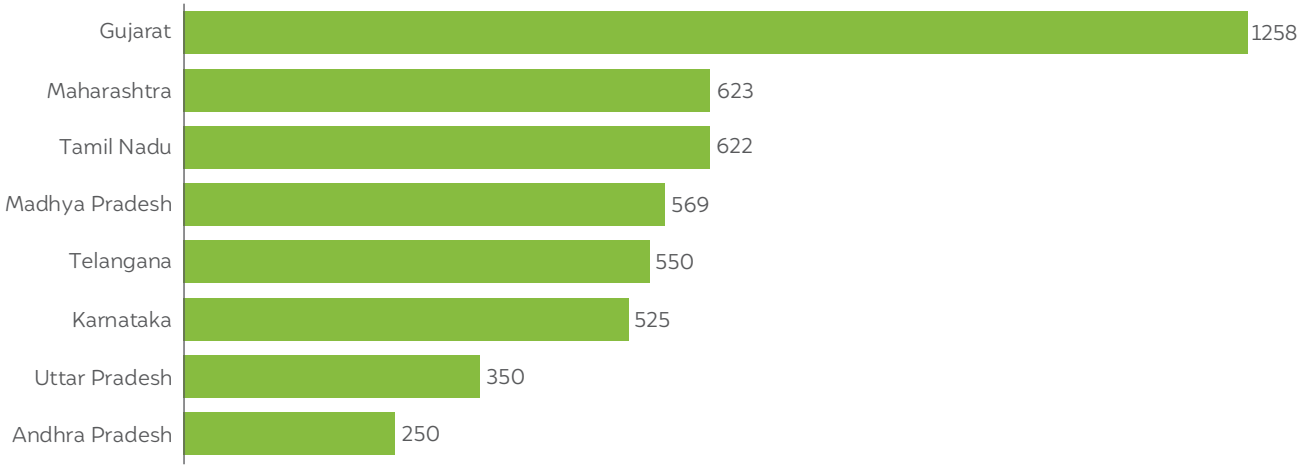
Source: CEEW-GFC analysis

Note: All figures in INR crore

Concentration by state

The top eight states account for almost all of the muni bond market in value and volume. Gujarat is the leader in muni bond issuances, with a total of INR 1,158 crore of bonds; the state is led by Ahmedabad, Vadodara, and Surat. Only 9 states have made issuances; the other 19 are yet to make a single issuance.

Figure 6 Municipal bond issuances remain limited to a few states



Source: CEEW-GFC analysis

Note: All figures in INR crore

4.2 Variations in pricing (coupon rates and yields)

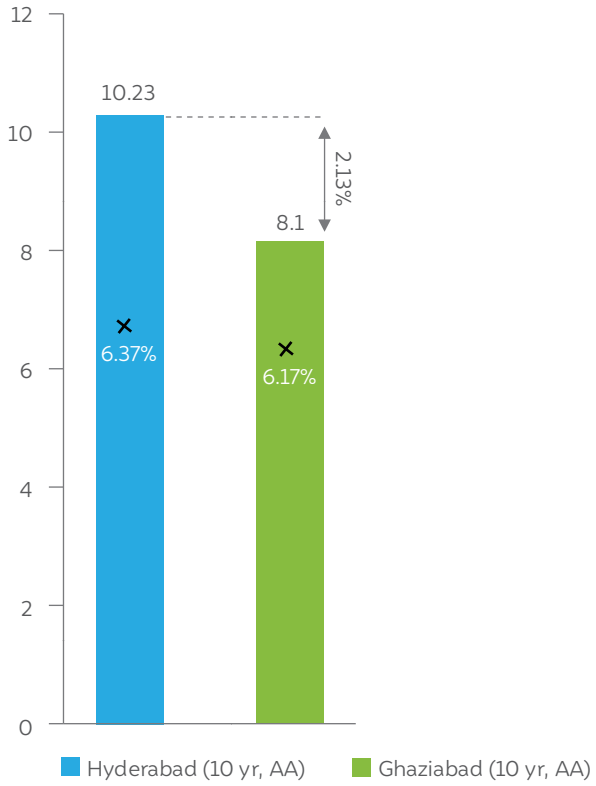
Optimum price discovery is an indicator of market maturity. In a mature bond market, investors are, at least theoretically, more or less indifferent while valuing two identical bonds (similarity reflected in credit ratings and duration). In the case of muni bonds, this does not hold true. Pricing variations are significant on at least two levels.

> **Muni bond spreads vary significantly from ~80 bps to ~390 bps even when ratings are identical.**

Pricing variations among muni bonds

Significant differences exist between the coupon rates of muni bonds, even among comparable groups of bonds, i.e., bonds with similar issuance size, tenure, and credit rating, which are issued within the same timeframe. However, this variability is not usually observed in other bond categories, such as corporate bonds, for which the market is relatively mature. For instance, the coupon rate of a 10-year AA-rated muni bond issued by Hyderabad MC in August 2019 was 213 basis points (bps) (2.13 per cent) higher than that of a similar muni bond issued by Ghaziabad MC in April 2021. Furthermore, difference in spreads of bonds issued by Indore MC and Hyderabad MC was a significant ~300 bps (over 3 per cent).

Figure 7 Comparable municipal bonds exhibit differences in coupon rates



Source: CEEW-GFC analysis

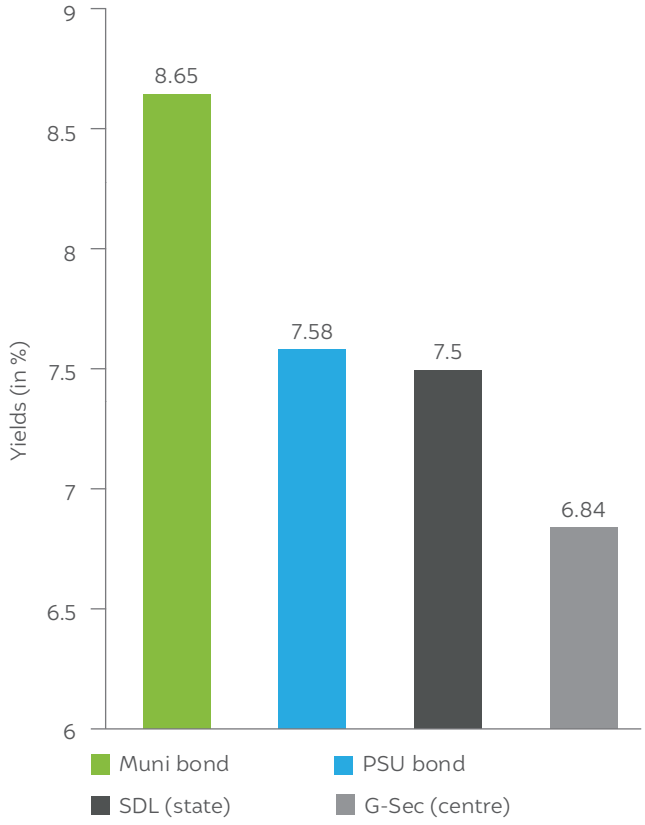
Note: X denotes yield on the comparable sovereign bond at the time of issuance.

Pricing variations among muni bonds compared to other groups of bonds

As per data from the NSE's fixed income indices,[3] there are large differences between the yields of muni bonds, other government bonds such as G-Secs and SDLs, and those issued by quasi-government institutions, such as public sector undertaking (PSU) bonds. While the spreads of PSU bonds and SDLs are around ~60–70 bps, i.e., 0.6–0.7 per cent, those of municipal bonds are almost 3×, at ~180 bps, i.e., 1.8 per cent. Meanwhile, the average spread of the comparable corporate counterpart (corporate bonds rated AA+ with a medium tenure) stands at ~140 bps.

Variability in the yields and coupon rates among municipal bonds of the same credit rating should ideally be minimalised in the long run, converging towards zero. This could also serve as critical feedback while revisiting the rating frameworks for ULBs created by credit rating agencies. Ultimately this leads to enhancement in the robustness and objectivity of these frameworks.

Figure 8 Municipal bonds offer higher, more attractive yields



Source: CEEW-GFC analysis based on NSE's fixed income indices[3]

3 NSE's fixed income indices as on 31 May 2024. Muni bond refers to the yield on NSE's IMBX; PSU bond refers to the yield on NSE's medium-duration (3–5 years) PSU bond index; SDL refers to NSE's five-year SDL index yield; and G-Sec refers to the yield on NSE's five-year benchmark G-Sec Index.

4.3 Phases of market development

Though issuances have been suboptimal, small, and sporadic, it is not all gloomy for the muni bond market. The market has seen considerable ups and downs, and evolved in a nonlinear fashion. To understand this nonlinearity, we unpack the growth trajectory of the market into three phases that coincide with three decades of market development. The cut-off dates for these phases were chosen on the basis of their importance to India's urban development trajectory. The first cut-off date is 2006, due to the launch of the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and the Pooled Finance Development Fund (PFDF) Scheme in 2005 and 2006, respectively. The second cut-off date is 2015 because of the launch of the AMRUT scheme and the introduction of SEBI regulations on muni bonds. On a positive note, market development has picked up since 2015.

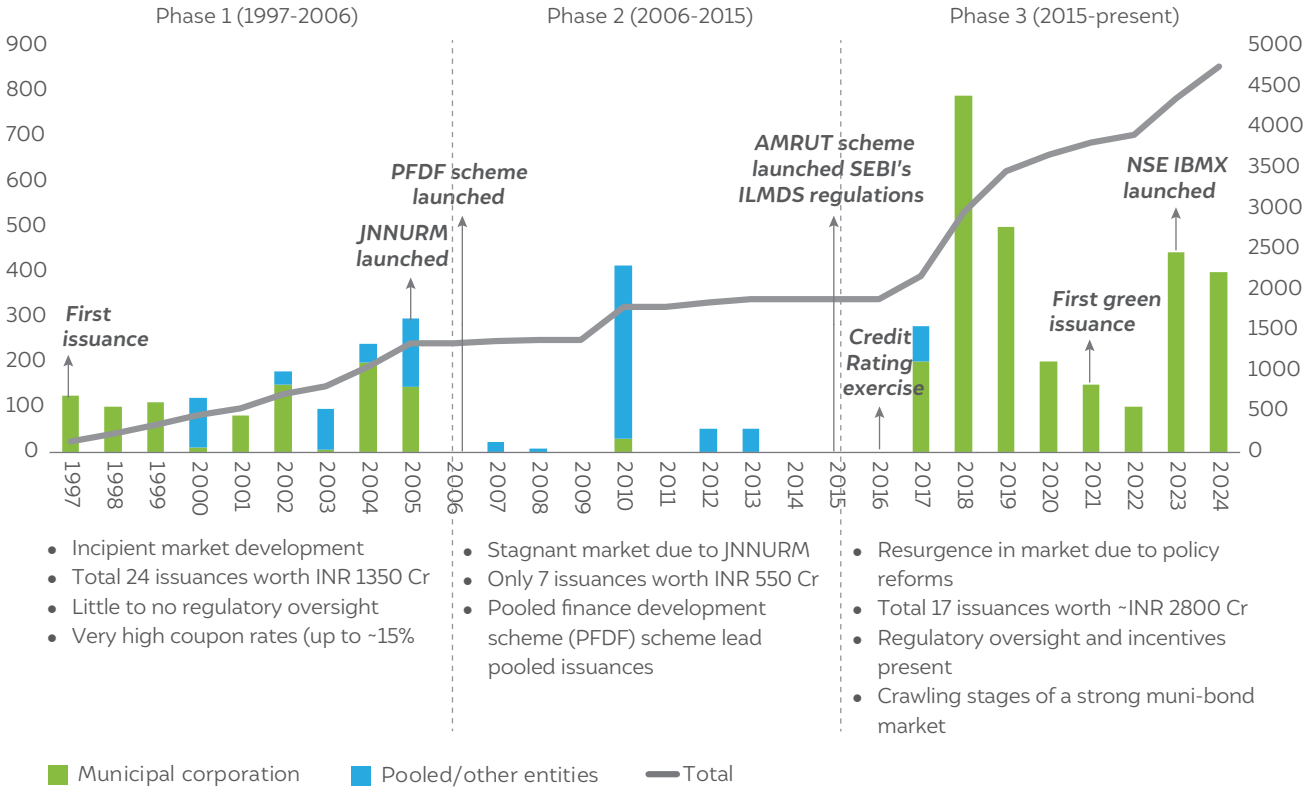
Phase 1 (1997–2006): Early development

This stage includes issuances from the first decade of market development. During this phase, the muni bond market, though incipient, gathered steam, with 17 MCs raising 24 bonds worth ~INR 1,350 crore. The average issuance size was ~INR 55 crore. However, this period was also characterised by high coupon rates (up to 15 per cent). This can be attributed to weak financial practices of municipalities, a lack of awareness among investors, and the absence of a specialised regulatory regime. In general, debt capital markets in India were at a stage of nascent development in the 1990s.

Phase 2 (2006–15): Stagnation

This period coincides with the *Jawaharlal Nehru National Urban Renewal Mission (JNNURM)*, launched in 2005. This mission proposed increasing the use of state and central grants for urban infrastructure development. As a result, the market stagnated between 2006 and 2010, and was followed by sluggish growth till 2015. The total issuance size in this period was a meagre ~INR 460 crore. The average issuance size was ~INR 65 crore. Another key development in this timeframe was the rise of pooled issuances, i.e., bonds raised by a collective state or local entity, whose proceeds went to multiple small municipalities. This development can be attributed to the launch of the *PFDF Scheme* in 2006.

Figure 9 The three phases of India's municipal bond market



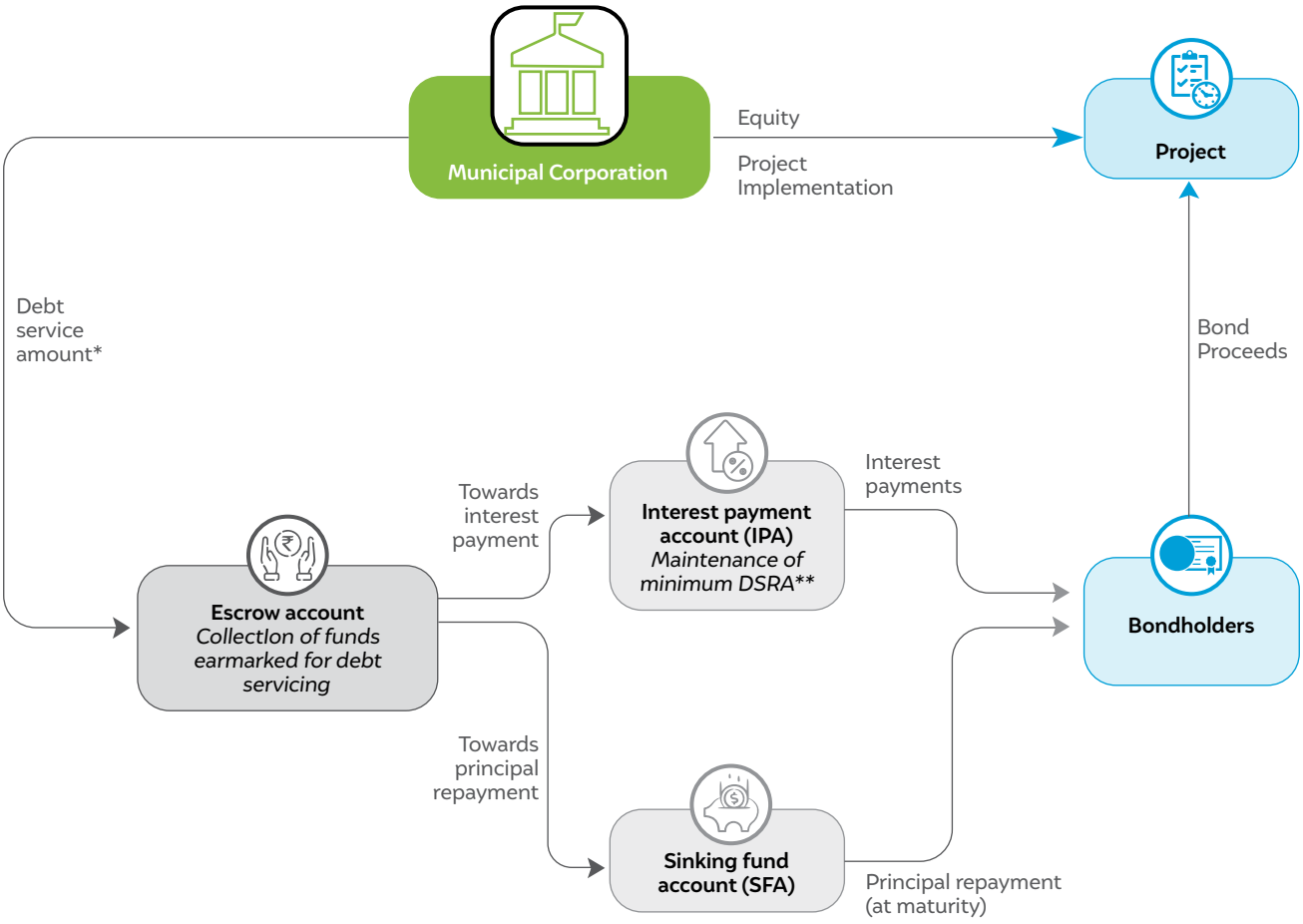
Source: CEEW-GFC analysis

Phase 3 (2015–Present): Resurgence and early signs of maturity

After the plateau between 2005 and 2015, there has been an uptick in the muni bond market. Total issuances since 2016 stand at ~INR 2,800 crore, with an average issuance size of ~INR 165 crore. Coupon rates have been an average of 8.6 per cent, hitting a record low of 7.15 per cent in the case of an issuance by Vadodara MC (VMC) in March 2022, vis-à-vis almost at par with the G-Sec of 6–7 per cent. Moreover, there has been a rise in muni green bond issuances since 2021. This period of revival and subsequent development can be attributed to a significant extent to the proactive policies anchored by the central government and other sovereign institutions; for example, the security market regulator (SEBI) and central bank (RBI), which are highlighted in the following section.

The figure illustrates the structured payment mechanism (SPM) of a muni bond. SEBI regulations (i.e. ILMDS) dictate that municipalities escrow a part of their own revenue receipts (tax or user charges). This money is collected and transferred into an interest payment account for debt servicing. Also, the municipality has to maintain a minimum level of debt obligation (e.g., two interest payments), in a separate reserve account, to provide risk coverage for any chance of default. This indirectly serves as an internal payment security mechanism for the bond. Moreover, an additional layer of protection is afforded by the appointment of a debenture trustee, who ensures that all these accounts align with the regulatory requirements and payments are made in a timely manner. In case of a shortfall or deviation from the regulations, the trustee intimates all relevant stakeholders. In the worst case, i.e., default, the trustee triggers the reserve account for interest payments.

Figure 10 Illustrative muni bond payment structure mechanism



Source: CEEW-GFC compilation

*Note: Escrowed via tax revenue/user charges/ project revenue (in revenue bonds)

**Note: DSRA (Debt service reserve amount) refers to the maintenance of a minimum reserve amount usually equivalent to 2-4 coupon payments that is triggered only in case of shortfall in the IPA

4.4 Recent policy developments

Over the last decade, significant steps have been taken to promote the muni bond market. Some of these developments have specifically targeted muni bonds.

Others have been general reforms in urban governance and finance that have implications and/or provisions for the muni bond market. These policy developments can be categorised into three key buckets mentioned in the table below:

Table 1 Significant policy developments affecting the muni bond market

What?	Who?	How?	Comments
Regulation	• SEBI • RBI	• ILMDS Regulations, 2015 (amended in 2017, 2019, and 2023) • Circular for green debt security for municipalities (for green bonds) • RBI regulatory reforms (2019)	• Regulations dictate minimum requirements for issuance, listing, and post-issuance compliances that strive to protect investor interests while promoting market development • The RBI now allows Foreign Portfolio Investors (FPIs) to invest in municipal bonds up to a maximum limit of 2% of the respective state's SDL issuances
Facilitation	• MoHUA • Bombay Stock Exchange (BSE)/NSE • RBI • Ministry of Finance/ Department of Economic Affairs (DEA) • CSOs	• Knowledge products (dashboards, e.g., AAINA and City Finance) and capacity building • Credit rating exercise under AMRUT • IMBX at the NSE • Municipal Bond Course	• A credit rating exercise was conducted to assess the credit-worthiness of MCs • NSE's new index for muni bonds provides a secondary market for listing muni bonds
Incentives	• MoHUA • State governments	• Monetary incentives for muni bonds and muni green bonds under AMRUT • State-level incentives such as credit guarantees and enhancements	• INR 13 crore incentive for every INR 100 crore on the first issuance, up to a maximum INR 26 crore, and INR 10 crore on the second issuance if it is a green bond • Additionally, some states such as Uttar Pradesh (UP) have provided credit guarantees through an infrastructure development fund (IDF)

Source: CEEW-GFC compilation based on various sources, including SEBI, RBI, Janaagraha, City Finance, MoHUA, and NSE

4.5 A case for accelerating muni bond issuances

Muni bonds offer at least four distinct advantages over a municipality's conventional infrastructure financing mechanisms, such as term loans and grants. They provide **long-term**, **low-cost**, large-scale debt, preferably from **new channels of financing (institutional investors)** that **help establish financial discipline**.

a) **Long-term:** Bonds tend to have significantly longer tenures (typically 5–25 years) than bank term loans. Therefore, they are ideal for financing infrastructure projects, especially green ones, e.g., water treatment plants or renewable energy (RE) projects, which have long gestation periods. Muni bonds are typically issued for 5–10 years. This provides municipalities some critical headway, at least in the short-to-medium term, for other expenditures, without compromising on infrastructure spending.

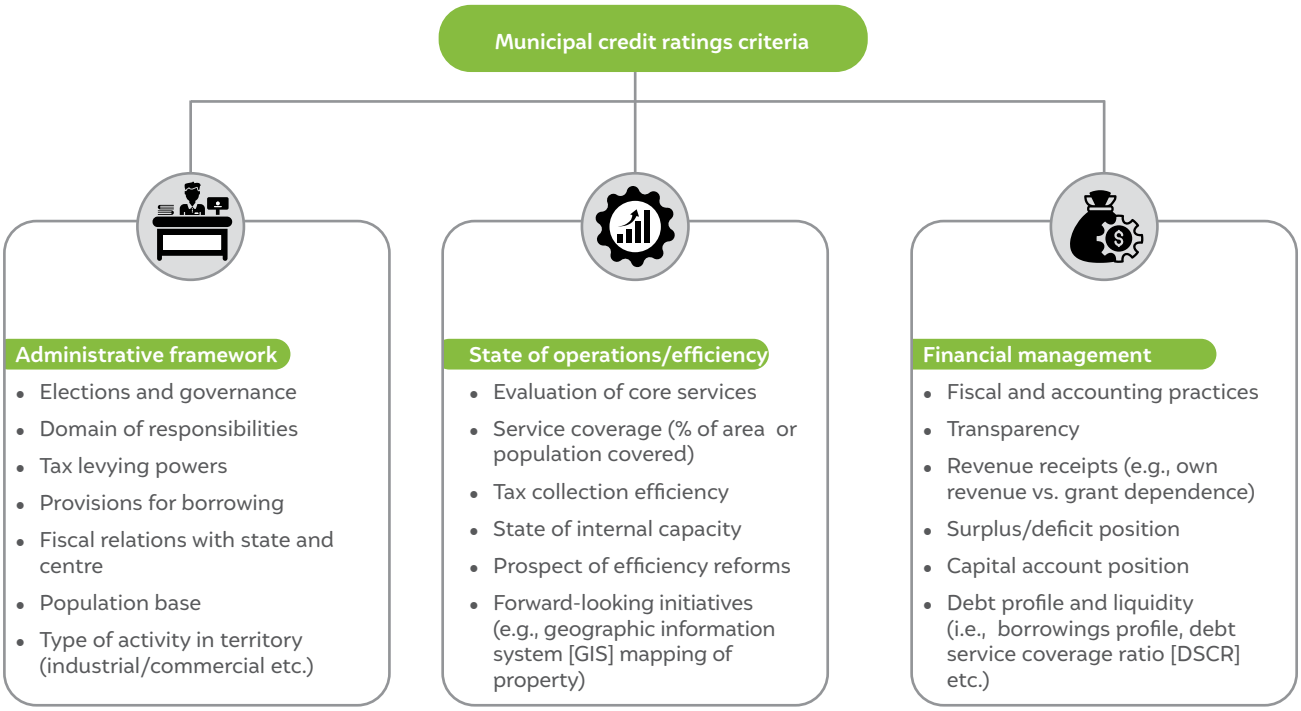
b) **Low-cost:** Interest rates for muni bonds are typically in the range of 8–9 per cent and, therefore, lower than, or at least comparable with, other sources of debt, such as term loans (though some term loans could be explicitly state guaranteed). Moreover, since there are direct monetary incentives from the MoHUA for muni bond issuances, the effective recurring debt obligation to municipalities in the case of a bond is significantly lower than a term loan. Assuming incentives are effectively interest rate subventions that are uniformly distributed over the tenure of the bond, the effective interest rate to the ULB is typically ~200–400 bps or 2–4 per cent lower than that of a term loan.

c) **New source of financing:** Muni bonds can widen the pool of probable investors, especially institutional investors who have an appetite for bonds. This helps the municipality diversify its revenue or borrowing base, which is highly beneficial in the long run. These investors primarily include mutual funds (debt), insurance companies, provident funds, and pension funds; that cumulatively manage assets worth ~INR 1 crore crore among themselves (USD 1.5 trillion) (IRDAI 2023; AMFI 2023). Moreover, these investors have sizable exposure to government bonds. For instance, the total assets under management (AUM) for the insurance industry on March 2023 was ~INR 55 lakh crore, of which ~INR 22 lakh crore (40 per cent) was invested in central government securities alone. Similarly, the employees provident fund had a total AUM of ~INR 13 lakh crore, of which central and state government securities constituted ~58 per cent of all assets.

d) **Means of financial and administrative discipline:** Muni bond issuance regulations mandate the continuous availability of timely audited financial statements, credit ratings, legal positioning, and improvement in the general transparency of a municipality's operations, such as through the provision of timely annual reports, information on credit history, and legal background. Bond issuance equates to adherence to these practices. Thus, it may improve a municipality's typical state of operations. Ultimately, this is useful for achieving better financial practices and enhanced enterprise resource planning (ERP), therefore pushing municipalities towards greater transparency and accountability.

> **Bond issuance compliance could nudge municipalities to reform their financial practices and enhance transparency.**

Figure 11 Credit rating criteria for municipal corporations



Source: CEEW-GFC's illustration based on credit rating frameworks provided by CRISIL (2023)

5. Muni green bonds

The International Capital Market Association (ICMA) defines a green bond as a type of bond, the proceeds of which are exclusively applied to finance or refinance new and/or existing eligible green projects (ICMA 2021). In general, the eligibility of a project to be labelled as 'green' is based on credible national and international taxonomies and/or frameworks. For instance, India's Sovereign Green Bonds (SGB) Framework, in alignment with other international best practices, includes eight categories of projects, ranging from RE to wastewater treatment.

There are four key components of a green bond:

a) **Use of proceeds:** Which category or mix of categories the money is spent/proposed to be spent in.

b) **Project evaluation and selection:** Which particular project in that category the money is spent on and the environmental objectives associated with it.

c) **Management of proceeds:** How much money is spent on which projects and/or proposed use of net proceeds.

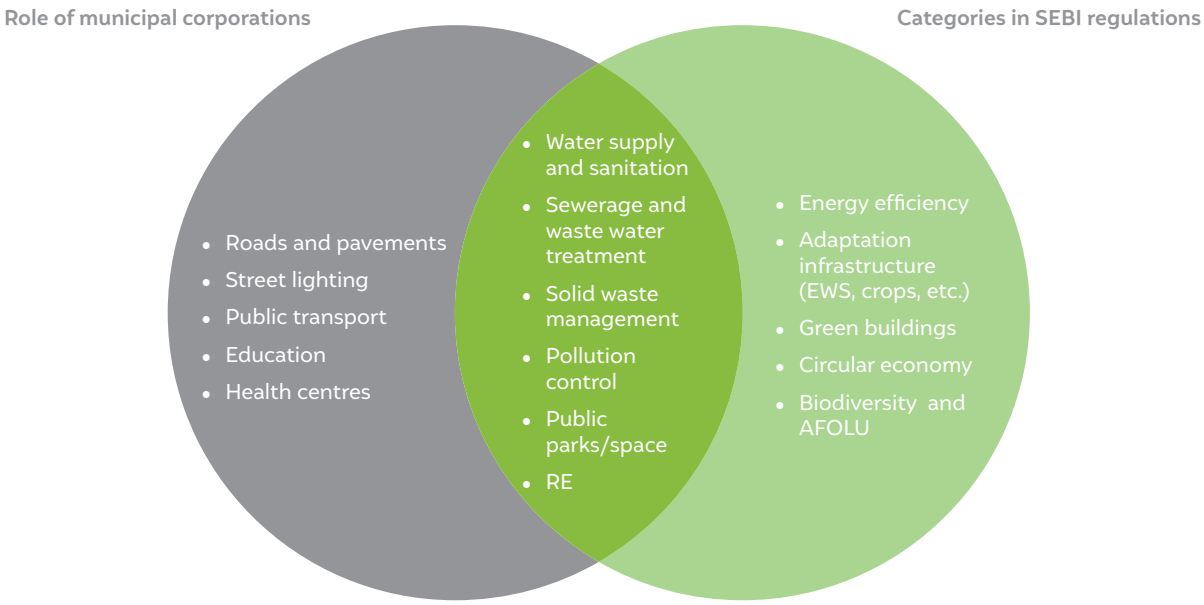
d) **Reporting:** Recurring information on the status of the project, and whether/to what extent its environmental objectives are achieved.

Across the globe, various groups of investors are increasingly being drawn to green bonds (Sangiorgi and Schopohl 2021). This growing interest can be attributed to multiple factors, such as cognisance of climate risks in investment decision making, a regulatory push from net-zero policy targets and commitments, and advancements in low-carbon technology projects, e.g., RE. It boils down to a dual motivation to contribute positively to the planet while also generating financial returns through responsible investments.

Though a shift in investor drive to make more socially responsible investments has contributed to the development of the green bond market, in certain cases, there are advantages associated with green bonds compared to conventional bonds. One such advantage is a pricing advantage or a greenium (CEEW 2023). While evidence supporting this may be mixed or inconclusive, green bonds in many cases have a pricing advantage over conventional bonds. Moreover, a green bond opens up access to dedicated institutional investors, especially those with a strong appetite for such asset classes, e.g., environmental, social, and governance (ESG)–dedicated funds and Principles for Responsible Investment (PRI) signatories.

When it comes to ULBs in India, a significant portion of their work, purely by design, pertains to sectors such as water, sanitation, and waste management. These are categorised as green by credible taxonomies. For instance, SEBI's regulations on green bonds, which has eight broad green categories, reveals a significant overlap between the operations of a ULB and the regulator's definition of green. This makes a strong case for ULBs to start exploring green bonds.

Figure 12 The Intersection between functions of municipality and SEBI green categories



Source: CEEW-GFC analysis based on SEBI

Municipalities all over the world have been issuing green bonds for over a decade. The Government of Massachusetts (US) issued the first muni green bond worth USD 100 million in 2013, followed by a ~USD 50 million issuance by the city of Gothenburg (Sweden). The city of Gothenburg has subsequently made three more green bond issuances worth ~USD 350 million since then (UNFCCC 2023). Other recent issuers include Johannesburg (South Africa), Seattle (US), London (England), and the local water utility of Washington, DC (US). Moreover, following its first issuance, Massachusetts made a larger issuance worth USD 350 million in 2014 (Lincoln Institute 2022). Importantly, the second green bond was issued on the same day as a vanilla bond of the same credit rating, and had a significant pricing advantage – signalling preferential marker participation.

In India there is currently not enough literature on muni green bonds. In that context, the analysis in the following section aims to fill this existing gap by answering three key questions:

First, how many muni green bonds have been issued, and what are their features?

Second, how many of the existing muni bond issuances could have been green?

Third, do muni green bond issuances have a pricing advantage?

As mentioned in Section 2, this analysis is based on a subset of the cumulative data set that includes only muni bonds that were issued in the last decade. This subset excludes the APCRDA bond, and amounts to 18 bond issuances.

5.1 Existing muni green bond issuances and their features

There have been four muni green bond issuances worth INR 694 crore (~25 per cent of the market) in the last decade. The first of these was made by Ghaziabad in 2021. It was worth INR 150 crore, and the proceeds were used to set up a sewage water treatment plant. This was followed by an issuance by Indore in 2023, worth INR 244 crore, for a solar plant. Indore's is the largest single issuance made by an MC till date. This was followed by two issuances in February 2024, worth INR 200 crore and INR 100 crore, by Ahmedabad and Vadodara, respectively. Both these bonds were raised to set up water treatment plants. Additionally, the latter was the first muni green bond in India to be certified as green by an external third party; the other three were self-labelled as green. Six muni bonds have been issued since the first green issuance. This means that four of the last six issuances have been green. All these issuances have credit ratings of AA/AA+.

Table 2 Muni green bonds in India with key indicators in reverse chronological order

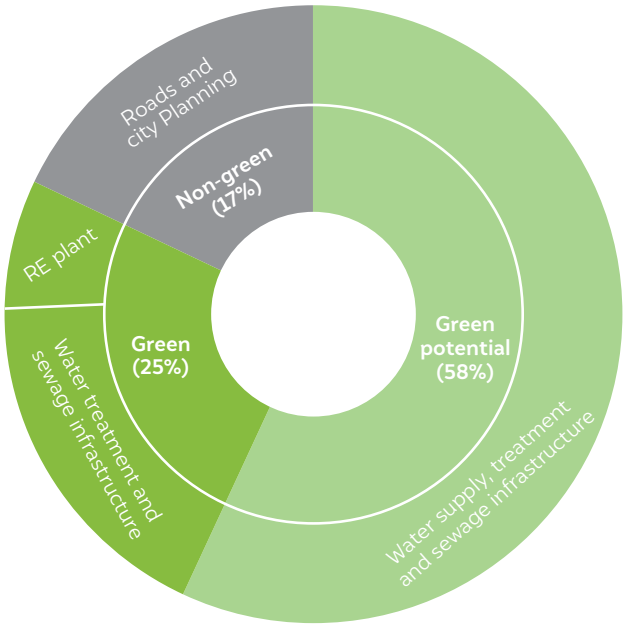
Municipal corporation	Date	Size (INR crore)	Use of proceeds	Coupon rates (%)	Term (years)	Credit rating
Vadodara	February 2024	100	Water treatment	7.90	5	AA+
Ahmedabad	February 2024	200	Water treatment	7.90	5	AA+
Indore	February 2023	244	Solar plant	8.25	9	AA
Ghaziabad	April 2021	150	Sewerage	8.10	10	AA

Source: CEEW-GFC analysis

5.2 How many muni bonds could have been green?

A cumulative INR 1,575 crore (~58 per cent) of all issuances in the subset could have been labelled as green. All of these issuances pertain to projects in water supply and treatment, sewerage, and river rejuvenation. When added to the green-labelled ones (25 per cent), the cumulative worth of bonds, the proceeds of which were used in green categories, amounts to ~INR 2,200 crore (~83 per cent of the subset). In other words, every INR 5 out of INR 6 that was raised as muni bonds in the last decade came under green categories while only a small fraction of that money was officially labelled. This indicates that the majority of muni bonds are actually green bonds but they have not been labelled as such. As mentioned previously, it is purely by design of a municipality's work that this coincidence exists. Moreover, the lack of labelling of these bonds represents missed muni green bond potential equivalent to INR 1,575 crore.

Figure 13 Muni bond categorisation shows significant green potential



Source: CEEW-GFC analysis

5.3 Do muni green bond issuances have a pricing advantage?

A pricing advantage in the bond market is denoted by a lower spread. We define spread as the difference between the yield of a muni bond and the comparable sovereign yield in the same timeframe. In the absence of data on the yields of muni bonds, coupon rates have been used as a proxy. For our subset, the average of the spreads achieved by the 18 muni bond issuances is ~1.62 per cent. The subset can be further divided into the following:

a) For the three non-green bonds, the spread is ~2.28 per cent.

b) For the 11 green-potential the spread is ~1.63 per cent.

c) For the four muni green bonds, the spread is ~1.11 per cent.

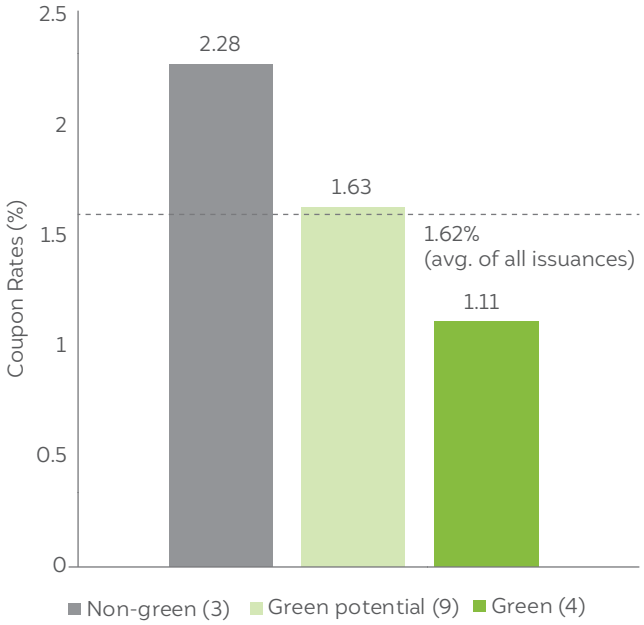
Lower spreads of both muni green and green-potential bonds suggest that bonds raised for green activities have a pricing advantage over non-green bonds. More importantly, lower spreads of muni green bonds compared to green-potential bonds are suggestive of a pricing advantage for muni green bonds, or in terms the pricing advantage of labelling a bond. Therefore, there is at least anecdotal evidence to make a case for muni bonds to be labelled as green, wherever appropriate. However, it is important to be careful while interpreting this result, as it is anecdotal and not causal.

It is worth mentioning that a pricing advantage can arise due to a host of factors, and not labelling alone. These factors may include the state of fiscal health and bond market history of the municipality, the municipality's

track record, macroeconomic conditions, and bond tenure. Labelling is just one of several factors. However, it is clear that ULBs planning to raise bonds for projects that are categorised as green should seriously consider labelling their bonds as green for potential savings.

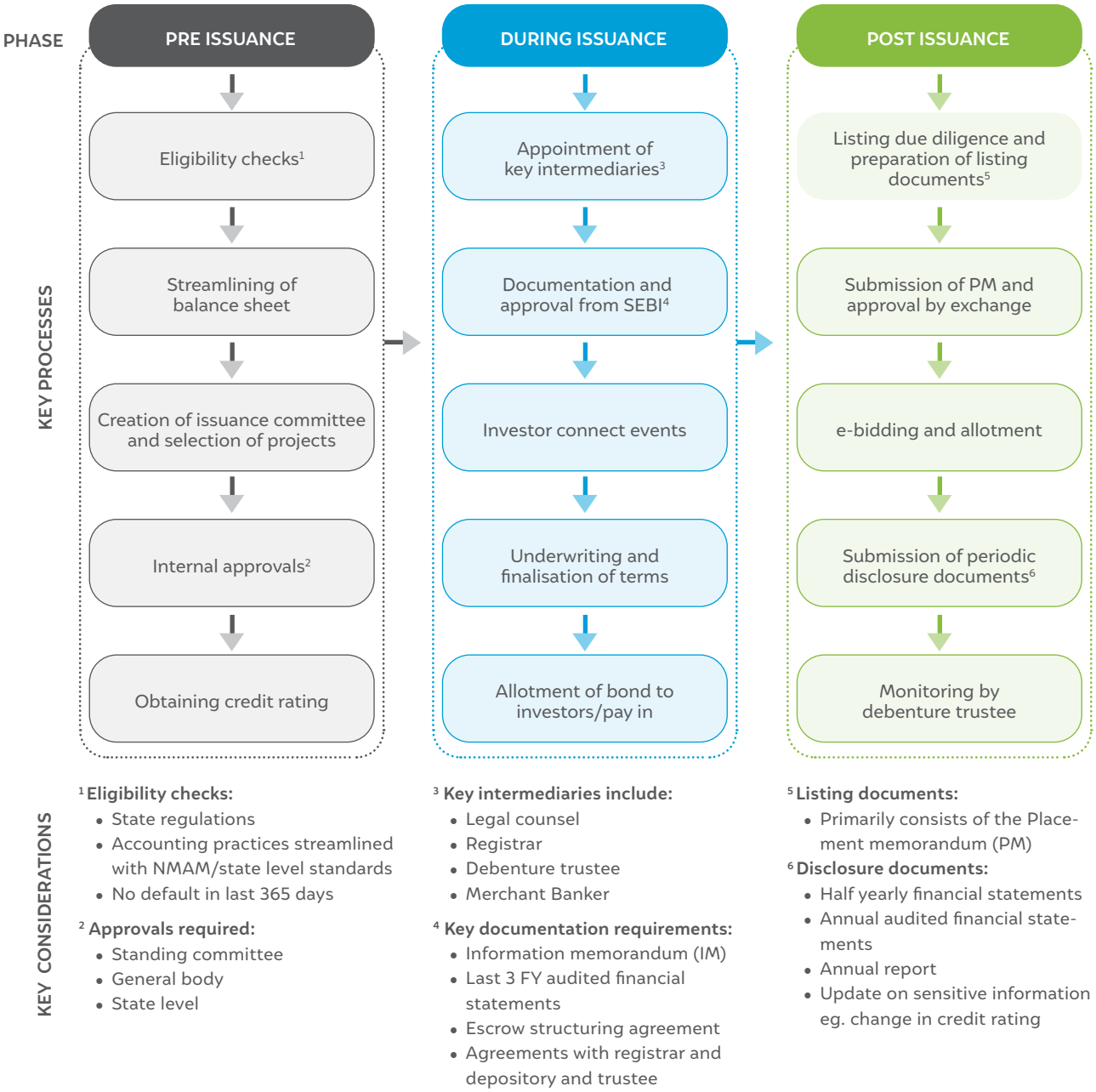
The case for muni green bonds has further support in the potential these bonds have to unlock critical climate adaptation finance in the urban context. There is a general consensus that climate finance flows towards adaptation finance are lagging behind mitigation. This lag is further magnified in urban areas, especially in India, where the needs grow exponentially but the finance flows are stagnant. Thus, this large gap only widens with time. In this context, muni green bonds could serve as a leading channel for urban adaptation finance. This could encourage financial institutions with a mandate for social development DFIs and multilateral development banks (MDBs) to participate in the muni green bond market and help proliferate it. The various means of participation that DFIs can explore may range from indirect facilitation (e.g., capacity-building exercises and technical assistance) to direct market participation (e.g., providing credit guarantees or investing in these bonds).

Figure 14 Municipal green bonds offer a clear pricing advantage over non green bonds



Source: CEEW-GFC analysis

Figure 15 Muni bond issuance and listing process flowchart



Source: CEEW-GFC compilation based on various sourcest

Note: Issuance processes could happen simultaneously and may not always follow the direction represented in the diagram above. For instance, appointment of a merchant banker or a financial consultant or credit rating exercise may happen even before eligibility checks are made.

6. Factors driving successful issuances

A review of past issuances based on discussions and review of key relevant documents such as credit rating reports reveals several common factors associated with successful issuances of muni bonds. These factors can be broadly classified into the following categories:

6.1 Enhanced financial practices and health

The factors common to all the municipalities that have made successful bond issuances are mostly related to enhancement of financial practices and health. Both financial practices and health are key to assessing the credit risk associated with a bond. Financial practices include adopting modern accounting systems (i.e., accrual accounting), providing audited annual financial statements in a timely manner, and conducting independent and timely credit rating exercises. Good financial health indicators and enhanced future outlook, such as a healthy revenue raising capacity, consistent surpluses, and sufficient liquidity reserves and debt service coverage ratio (DSCR) also play a critical role in ensuring successful issuances. Indeed, both enhanced financial practices and strong fiscal health are necessary conditions for a successful issuance. To achieve this, sufficient capacities are needed within the municipality. Moreover, at a systemic level, greater fiscal devolution of financial powers should be considered, at the centre and states, to enhance overall financial health.

6.2 Synergy and engagements

Another set of factors driving successful issuances include engagements and synergy between ULBs and different stakeholders. For instance, a supportive state government ecosystem, such as the one in Gujarat, may lead to a healthy and vibrant bond market. Policy synergy at the state level ranges from regulatory clarity and consistency on bond issuances to nudging advisory and state-level entities to invest in muni bonds and/or provide credit guarantees. MCs that have raised bonds have also maintained constant engagement with important financial intermediaries, such as credit rating agencies and merchant bankers throughout the bond issuance process. This engagement may range from a few months to a few years. Moreover, in certain cases, technical support services (such as debt potential estimation; project identification and preparation; and bond documentation and structuring) from public institutions such as the United States Department of the Treasury (US Treasury) has proven critical in driving the success of an issuance.

6.3 Other emerging factors

Since issuances are still low in volume and sporadic, there is uncertainty about what makes a successful one. However, some emerging factors have contributed to the success of muni bond issuances. For instance, the previous section points out that labelling potential green bonds could be important in determining a pricing advantage. Labelling could also provide reputational advantages to the municipality. For example, the municipality may consider making the issuance public to encourage participation of the general public; this might instil trust among citizens in the state apparatus. Moreover, labelling could also instil, in investors, confidence in the project's veracity. This can further be used to leverage additional revenues through carbon and green credit markets.

7. Substantial issues persist

Although the muni bond market, and its subsidiary the muni green bond market, have progressed in the last few years, some central issues have deterred their progress. For instance, though many MCs have budgets as large as many corporate firms, their management practices are not at par with corporates. Moving forward, and to develop a vibrant and dynamic bond market, these issues have to be dealt with in a planned and comprehensive manner.

7.1 At the ULB level

a) **Inadequate financial discipline and disclosures:** Publishing timely audited annual financial statements is a bare-minimum requirement for the provision of a credit rating and to access capital markets. At the least, this includes the balance sheet, annual income statement, and cash flow statement of the ULB. Many ULBs still follow traditional cash-based accounting, instead of a comprehensive accrual accounting system. This limits understanding of their financial health and reflects their failure to adhere to globally acceptable standards of financial reporting. Moreover, most ULBs do not conduct annual audits or disclose financial data to the public.

b) **Poor fiscal health:** Fiscal health lies at the centre of the credit-worthiness of a municipality. Some robust measures of a ULB's fiscal health are the extent of its revenue diversification, level of dependency on own revenue, revenue/operating surpluses, liquidity reserves, and financial wherewithal to cover its interest payments. Fiscal health is determined by the extent of revenue raising powers vested with a municipality and how well the entity exercises those powers, i.e., its efficiency parameters. Additionally, the financial health of an organisation (fiscal health, in this case) is reflected in its credit rating. Not many ULBs conduct regular credit rating exercises. Also, many that opt for a credit rating do not get it reaffirmed in subsequent financial years. Improvement of credit rating is one of the 54 reform milestones set under the *AMRUT* scheme. A large-scale credit rating exercise conducted in 2017–18 under this scheme revealed that out of about 500 cities, 161 had ratings of BBB– or above, whereas only 35 cities were in the zone of A– and above (MoHUA 2018). Moreover, data from MoHUA – accessed through the City Finance portal shows that only 83 out of 250+ MCs had investment-grade ratings and above.

c) **Lack of internal capacity:** Internal capacity refers to the in-house expertise of a ULB. This refers to the presence (or lack thereof) of relevant experts, and the expertise or skill sets in the workforce. A lack of internal capacity may be prevalent across various verticals, ranging from finances to climate change. For instance, many ULBs lack the in-house expertise to deal with transitioning from traditional cash-based accounting systems to modern accrual accounting systems; adhering to best practices on earmarking appropriate projects; and preparing technical reports. Exploring capital markets to raise infrastructure finance is yet another area in which capacity lags persist.

d) **Political economy–related issues:** Since ULBs are political bodies, there are issues related to the political aspect of their operations. For instance, regime changes could lead to uncertainties for investors. Moreover, in some cases, a lack of synergy and/or consensus between the elected representative and the appointed representative could also be a deterring factor in the issuance of muni bonds.

7.2 At the systemic level

a) **Absence of organic demand/constrained investor base**: On the supply side, we observe incipient development in the muni bond market, including a spike in muni green bond issuances. The demand side, however, remains uncertain. Barring a few examples, muni bond issuances have occurred based on pre-negotiated agreements between municipalities and investors. In some cases, state entities, PSUs, and local pension/provident funds have led the issuances. Private investors, especially large institutional investors/financial institutions, like mutual funds, which usually have an appetite for bonds, have been absent. Moreover, only one issuance (by Indore) has been public, opening itself to retail investors. This indicates that despite the stringent regulatory requirements and many layers of risk mitigation (like maintaining an SPM), organic demand for these bonds is still missing. Possible explanations for the absence of institutional investors could be the sporadic nature of issuances, lack of trust or familiarity with ULBs among investors, and regulatory stringency such as in the case of insurance funds, which must be conservative in their investments. For instance, there are mandates on maintaining a minimum portfolio exposure in central and state government securities and a cap on exposure to corporate bonds and other approved securities of high investment-grade credit quality (IRDAI 2024).

b) **Lack of track record/liquidity**: Only a select group of MCs have raised bonds so far – 18 out of 253, meaning that 235 are yet to issue a bond. Therefore, there is a lack of frequent issuances, ultimately resulting in little to no track record and negligible liquidity. Moreover, the sizes of issuances till now have been small; INR 100 crore has been the most popular amount. As a result, investors, especially institutional investors, have tended to take a conservative approach and avoid buying these bonds. This highlights the need for the rapid issuance of large bonds to build a continuous track record and simultaneously encourage liquidity in the muni bond market. The recent muni bond index (IMBX) on the NSE is a positive move in this regard.

c) **Crowding out by other alternative sources of capital**: Due to a lack of robust own revenue sources and an inability to take debt on their own financial strength, most ULBs depend on grants from the state and centre for their capital expenditure. ULBs

also borrow from banks and bodies like HUDCO via term loans for infrastructure expenditure. Moreover, many DFIs like the Asian Development Bank (ADB) and Tamil Nadu Urban Development Fund (TNUDF) extend concessional credit to municipalities. Estimates show that between FY11 and FY18, more than 99 per cent of municipal debt came as loans from financial institutions, including banks, state financial institutions, and development banks. However, almost all of these borrowings have the security of a state guarantee. In fact, guaranteed loans have been on the rise in the last decade (2011–20). Estimates by the World Bank show that in 2018, ~84 per cent of all the municipal debt was guaranteed by states. As a result, private financing (like bonds) gets crowded out and becomes less attractive as a means of capital. This creates an additional burden on the public debt of states, as a state guarantee usually involves providing a guarantee fee and/or inclusion of the debt in the state's contingent liabilities. This may put its debt sustainability at risk, particularly in the context of the central government directives on fiscal deficit and contingent liabilities (NIPFP 2024).

Issues that are specific to muni green bonds are listed next. The question that arises is whether the reputational gains and pricing advantages of a green issuance offset the costs and effort needed to make a green bond issuance.

d) **Regulation and certification fee**: For a bond to be labelled as green, there are four core components prescribed by the ICMA. These are the use of proceeds, project evaluation and selection, management of proceeds, and reporting. These four aspects encompass the three elements of a green bond, or the 3Ps: project, proceeds, and proof. The first two elements, i.e., those related to the proceeds and project, are not deterrents for ULBs purely by design. Most muni bond proceeds are invested in activities labelled as green. The third element, i.e., proof, however, could be an additional burden for them. To comply with reporting, ULBs would have to hire an external auditor, who would verify the utilisation of proceeds. Moreover, credible green certification by a third party might also need to be considered; this would entail a certification fee. Therefore, the proof element requires money, time, and resources, which are additional burdens on municipalities.

e) **Lack of familiarity with bonds**: Municipalities currently lack the in-house expertise necessary to explore capital markets. On top of that, in the context of a green issuance, there is a need for experts on climate change– and sustainable finance–related projects who could help ULBs navigate capital markets. For instance, municipalities may need to ramp up their internal capacities to select appropriate green projects, conduct suitable and detailed project reviews, and publish the required disclosures in a timely manner. Institutional investors that are developing an appetite for green bonds and climate-related projects are likely to care about all this.

Box 1 **Case study: Key factors behind success of Indore MCs muni green bond issuance**

Indore

The Indore MC (IMC) raised bonds in 2023 to finance its 60 MW captive solar power project. The corporation has identified 210.84 acres of land in the adjacent villages of Samraj (165.20 acres) and Ashukhedi (45.64 acres) in the Khargone district of Madhya Pradesh for the project. It is India's largest muni bond issuance.

Key indicators

Size of issuance
INR 244 crore

Coupon rate
8.25 per cent

Tenure
3–9 years

Use of proceeds
Solar power project

Key drivers of successful issuance and quality of bond

Fiscal governance and practices	Financial health of the municipality	High operational efficiency	Other specific conditions
IMC switched to accrual accounting in 2006, and publishes its annual financial statements in a timely manner. It has healthy own tax and non-tax revenue streams that underwent a steady rise of 14 per cent annually between FY19 and FY23.	IMC had consistent revenue surpluses ranging from INR 583-664 Cr between FY20-22. The MC's own income (excluding the assigned revenue and grants) constituted 45 per cent of the total revenue income, on average in the same period. It has comfortably managed its debt servicing position as debt servicing stood only at ~5% of operating revenue and DSCR stood at 7.5× in FY22. The debt burden, which was INR 5,794.31 million in FY22 increased with the bond issuance– however the municipality's fundamentals are robust to service said debt.	IMC maintains a high level of service delivery in key areas such as solid waste management and water. Moreover, property tax collection efficiency in terms of current demand was in the range of 54–68 per cent during FY20–22. On the arrear's recovery front, collection efficiency has been modest – showing slight improvement in FY23 (26%) from FY22 (18%).	SPM entails the creation of an escrow account for own revenue collection (defined as revenue/ cash flows being directly levied and collected or recovered by the IMC), with priority for the servicing of bonds. The own revenue heads include tax revenues (property tax, water tax, and advertisement tax); rental income; fees and user charges; sales and hiring charges, excluding betterment tax; and building permission fees.

Source: CEEW-GFC compilation

Box 2 **Case study: Key factors behind succes of Vadodara MCs muni bond issuance**

Vadodara

The VMC raised bonds in 2022 to finance water supply and sewerage projects in Sindhrot, Gujarat. The MC initiated water supply projects to meet the drinking water needs of the city and a liquid waste management project to help with the effective disposal of sewage water. This issuance has the lowest coupon rate of any muni bond in India.

Key indicators

SIZE OF ISSUANCE
INR 100 crore

COUPON RATE
7.15 per cent

TENURE
5 years

USE OF PROCEEDS
Water supply and sewage

Key drivers of successful issuance and quality of bond

Financial practices and position	High operational efficiency	Supportive state government ecosystem	Engagements and collaborations
VMC switched to accrual accounting in 2007, and adheres to timely publishing of its annual financial statements. It has healthy and consistent own tax and non-tax revenue streams. Revenue receipts amounted to over INR 1,100 crore for the three fiscals from FY19-21, with a healthy operating surplus of upwards of INR 100 crore between FY16-21 relatively low debt.	The tax collection efficiency of the VMC is high. This is indicated in the efficiency of property tax collection, consistently maintained above 90 per cent, except for during FY21, due to the impact of the pandemic. The completion of geographic information system (GIS) mapping and simplification of the tax assessment and dispute resolution mechanism has led to improvements in the collection of taxes over the years. Collection efficiency for other taxes/charges is also strong on account of consolidated billing for all taxes. In addition, cost recovery for services is healthy, at 84 per cent for water supply and 71 per cent for solid waste management.	Being a pioneer in the muni bond ecosystem, Gujarat has clear and consistent rules for municipal debt issuance. The state has a proven track record of assisting local governments with debt. Moreover, in the case of this particular bond issuance, state PSUs were also among the key investors.	VMC collaborated with the US Treasury and received constant technical assistance from experts throughout the bond issuance process. The MC also continuously engaged with credit rating agencies and investors by organising investor networking events to garner a wide audience for the bond.

Source: CEEW-GFC compilation

8. RISE: Four key points for ULBs

There is huge potential in both the muni bond and muni green bond markets, which MCs and investors can tap into. On the supply side, we need a track record of large issuances from diverse geographies. On the demand side, robustness can be established through the engagement of private institutional investors. It is also important to consider issuing green bonds when projects align with green bond regulations. Various estimates of the potential size of the muni bond market by organisations such as CARE Ratings (2024) and the World Bank (Athar et al. 2022) range widely, from USD 3 billion to USD 8 billion. Applying our analysis, an estimated 83 per cent of this market could be green (see Section 5.2). Therefore, even using a conservative estimate, the muni green bond potential ranges from USD 2.5 billion to ~USD 7 billion over different timelines up to 2030.

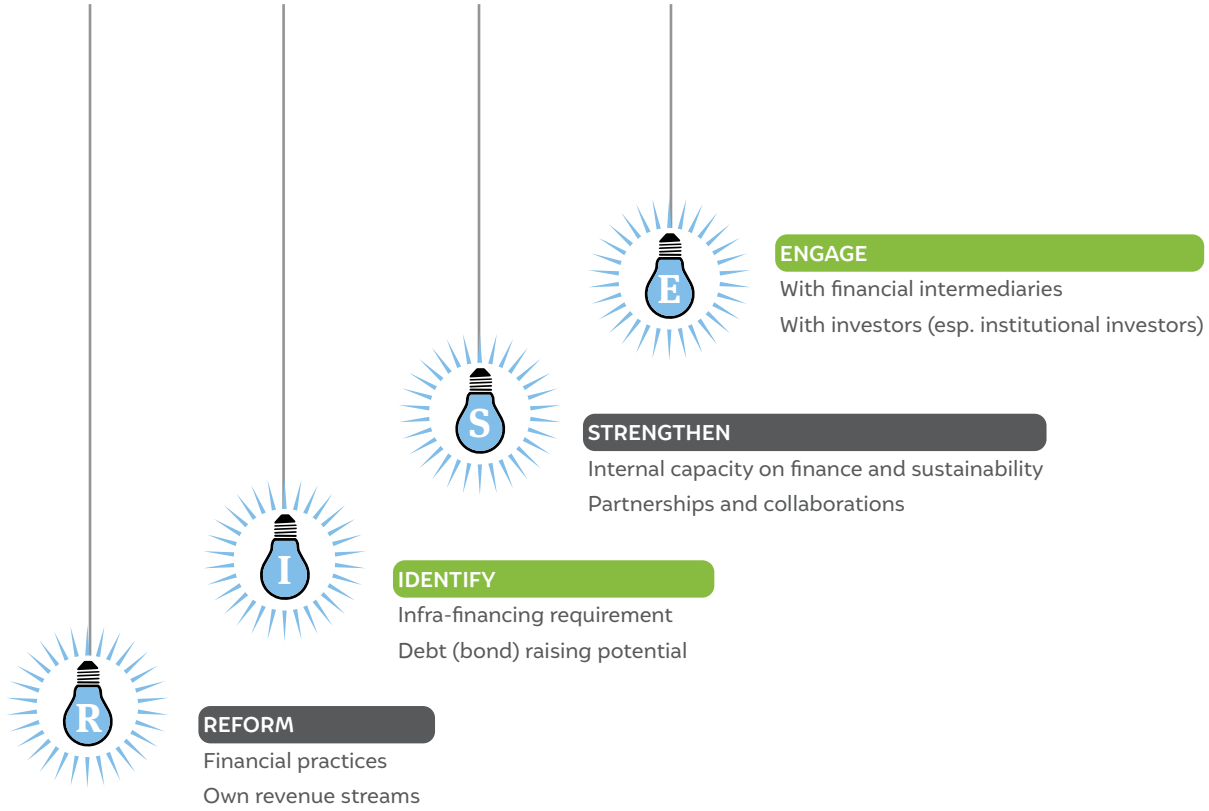
Table 3 Muni green bond potential

Source	Muni bond potential (USD billion)	Timeline	Muni green bond potential: CEEW-GFC estimate (USD billion)	Comments
World Bank	7.7–8.4	2018–28	6.4–7	27 biggest MCs
CARE Ratings	3	2024–30	2.5	36 biggest MCs

Source: CEEW-GFC compilation

To reach this potential, much more guidance and facilitation is needed for ULBs. Our framework includes four key action points that ULBs must focus on to raise green bonds. We aim for this to serve as a reference document for what is needed to issue bonds.

Figure 16 RISE framework snapshot



Source: CEEW-GFC analysis

I. Reform

Financial practices: ULBS must embrace robust financial practices, including accrual accounting and transparent auditing. This means conducting audits and publishing annual financial statements in a timely manner. These practices are essential to bolster investor confidence and access capital markets. We propose utilising bond issuance as a catalyst for financial reform. As prescribed by the SEBI, municipalities must get a credit rating and publish three years of audited financial statements before issuing bonds. This is also among the key challenges that the 16th FC may face, and one of the ways for the FC to push ULBs towards better financial practices and transparency is to acknowledge the issuance of bonds as a means of transformation and provide additional incentives in that direction.

Own revenue streams: Reforming revenue streams is key to bond issuance for two key reasons. First, the reformation of revenue streams and an enhanced future outlook would positively affect the credit rating of an MC. Moreover, under the current regulatory regime, debt obligations have to be made by escrowing revenue. This makes it even more important for MCs to explore revenue reforms in various forms. One popular way is to leverage technology such as GIS mapping to improve tax collection. MCs must also explore periodic enumeration, digitisation of billing and collection, new user charges, and hikes to existing user charges such as parking. Indeed, if bond proceeds are used to finance revenue-generating infrastructure, optimum user fee collection would indicate efficient operations and further solidify investor confidence in the bond. For example, the Rajkot MC recently raised a bond with a 7.9 per cent coupon rate. This was made possible through improved service delivery and operations and a higher operating surplus, on account of revisions to taxes and user charges, coupled with higher collection efficiency that elevated its credit rating from A – to AA. Additionally, ULBs could tap into carbon markets, especially voluntary carbon markets, to explore additional sources of revenue. Since ULB operations align with what constitutes 'green' purely by design, they are well suited to exploit these markets, especially using a carbon credit aggregator model. With such a model, an enterprise can bundle its carbon mitigation and green activities together and package them into tradable commodities without having to bear significant upfront costs. Following a similar approach, in 2019, the IMC was the first ULB to generate additional revenue through carbon credits, realising ~INR 9 crore by September 2021 (Deccan Herald 2022).

II. Identify

Green-labelled infrastructure projects: Most infrastructure requirements of an MC related to the delivery of civic services and urban climate adaptation can be categorised as green. Therefore, ULBs must identify and earmark specific service delivery objectives (e.g., the treatment of water) and recognise overlaps with categories of green bond regulations, in order to reap the benefits of labelling the bond as green. An illustrative example is provided in the Venn diagram in Section 5. A critical bottleneck in this context is a lack of technical capacity in ULBs to create a deployable shelf of projects, especially sustainable ones, that are ready for investment (NITI Aayog 2015). This could be partially dealt with by incorporating elements of sustainability in general town planning; for instance, in master plans. In the short run, consultants could be hired to do so but the long-run feasibility will depend on ramping up internal capacities. It is crucial for ULBs to create such a pipeline of projects so that the muni bond market can take off.

Debt potential and subsequent revenue streams: Debt servicing for a muni bond is done by escrowing some part of the MC's revenue to a separate no lien account. Therefore, MCs have to pay out of pocket, meaning that they must first identify robust revenue streams that are consistent and certain, i.e., there are assured future cash flows. Municipalities must start identifying their debt raising potential through the projection of future revenues, either independently or by collaborating with other organisations. They could also hire an internal consultant to help them with this. At any given point, an MC's fiscal prowess (debt raising/servicing potential) is determined by its fiscal independence (scale and longevity of its own revenues).

III. Strengthen

Internal capacity for financial and sustainable project preparation: MCs must onboard relevant professionals with expertise in finance, especially for city financing and accessing debt capital markets. Other than this, they can explore climate- and sustainability-related issues. A key suggestion is to establish separate verticals that are each dedicated to sustainability/green projects and infrastructure. Such verticals would serve as a green project preparation facility and be complemented by expertise in sustainable/green finance. The latter is crucial to tap into debt capital markets and dedicated climate-related pools of capital, such as those provided by DFIs. For example, the Pimpri

Chinchwad MC has a sustainability cell to tackle climate-related issues. A central area of development for MCs in this regard would be to invest in modern Enterprise Resource Planning (ERP) and Management information systems (MIS) to help them align with best practices in project management, accounting and budgeting, human resources, and capacity building. This would help MCs reform their finances, and measure, monitor, and communicate information about their sustainability-related initiatives to relevant stakeholders.

Partnerships and collaborations: MCs must leverage partnerships and collaborations with different categories of institutions. For example, the government institutions or international institutions such as US Department of State for technical assistance; financial institutions, such as credit rating firms or advisories, for financial planning and opinions; development institutions such as the World Bank for concessional finance; and CSOs and think tanks for capacity-building exercises.

IV. Engage

With financial intermediaries: Currently, the majority of MCs do not have a recent credit rating, at least public in domain. Moreover, those that get credit ratings do not reaffirm their rating in subsequent years. The last systemic credit rating exercise for a large number of MCs was done in 2017. MCs must now engage extensively with various financial intermediaries, such as credit rating agencies, transaction advisors, and merchant bankers. Themes of the engagements may vary, from ensuring accounting reforms to getting a credit rating done. Since ULBs are still in the incipient stage of development, this might mean hiring an internal consultant in the short run to lead the engagements with other institutions.

With investors: The demand for a bond (which affects its price) lies in how investors value it. However, this is contingent on the information provided to investors. At present, there is a lack of information flow between muni bonds and private investors, especially institutional investors. This impedes the creation of robust demand for muni bonds and, therefore, must be resolved. Institutional investors such as the Life Insurance Corporation (LIC) hold ~INR 15 lakh crore (~USD 180 billion) in central government securities but do not buy muni bonds. These investors are among the most heavily regulated in the financial industry, with specific portfolio mandates set by regulators. These mandates, however, pertain only to G-Secs and SDLs. Therefore, extensive work is required for each muni bond issuance, to convince investors of its effectiveness. Municipalities, such as the VMC, that have conducted multiple investor roadshows have ultimately fetched the lowest coupon rates among all the muni bonds. The only drawback is that most of this demand has come from government institutions and not the private sector. To tap into a broader set of investors, focused engagement is crucial.

9. Key recommendations

1. **Use incentive money in innovative ways**: Direct monetary incentives for muni bonds under *AMRUT* could be used in many ways. We suggest breaking the incentive amount into two parts. One would be directly transferred as a lump sum to the municipal body (to create supply). The other could be used as a partial credit guarantee for the issuance (to create demand).

2. **Establish incremental incentives**: To build a robust muni bond market and ensure private sector participation, it is imperative to step up the size of issuances, at least by the large ULBs. To do so, incremental incentives could be offered on a sliding scale. For instance, there could be a fixed increase in the incentive per additional INR 100 crore of issuance.

3. **Ensure state-level guarantees**: Urban local governance comes under the state legislature in India. Therefore, it is the state's responsibility to provide incentives for muni bond issuances. These incentives could be in the form of a credit guarantee by the state, such as the one provided by the UP government through the Uttar Pradesh Infrastructure Development Fund (UPIDF). In the long run, this would also reduce ULB dependence on devolution from the state government.

4. **Establish regulatory clarity:** At present, state-level laws on muni bonds (and municipal debt) have significant variations. As per the RBI, in certain cases these laws are either too prescriptive or lack clarity. Indeed, some states do not explicitly recognise bonds as permissible borrowings. Clearer state laws that align with central government provisions and borrow from best practices from other states could help establish regulatory clarity.

5. **Build a muni bond preparation facility:** To mitigate capacity constraints and reduce the general lack of familiarity with the muni bond market, a muni

bond preparation facility could be formed. Such a facility could work on project preparation (including conducting project appraisals) and financial advisory (such as assessing the debt potential of ULBs or initiating investor networking events). The facility could be created at the state level and complemented by a state-level urban infrastructure pipeline.

6. **Introduce portfolio targets for institutional investors:** Institutional investors such as insurance and pension funds have fixed portfolio targets for central and state government bonds. Similar (small) targets could be introduced for muni bonds and muni green bonds of superior credit quality; for instance, those with credit ratings of AA+ and above and/or those guaranteed by the state. Portfolio targets as small as a fraction of 1 per cent could be critical for building momentum among institutional investors.
7. **Employ muni bonds for refinancing:** Muni bonds, due to their low cost, could be used to refinance existing municipal debt, such as term loans, which could be more expensive (in interest rate terms). However, regulatory aspects on refinancing may vary from state to state.

Annexure

Table A1: Consolidate dataset of municipal bond issuances since 1997

S. no.	Municipal Corporation/ Entity	Issuance date	Size (INR Cr)	Use of proceeds	Coupon rate	Term (years)	Bond rating	Comparative G-sec	Indicative spread
1	Rajkot Municipal Corporation (RMC)	Nov-24	100	Water supply and treatment	7.90%	5	AA (CRISIL)	6.75%	1.15%
2	Vadodara Municipal Corporation	Feb-24	100	Water treatment	7.90%	5	AA+ (INDRA)	7.04%	0.86%
3	Ahmedabad Municipal Corporation	Feb-24	200	Water treatment/ renewables	7.90%	5	AA+	7.04%	0.86%
4	Indore Municipal Corporation	Feb-23	244	Solar plant	8.25%	6	AA (CARE), AA+ (Indra)	7.43%	0.82%
5	Pimpri Chinchwad Municipal Corporation	Jul-23	200	Water treatment/ river rejuvenation	8.15%	5	AA (CRISIL), AA+(CARE)	7.05%	1.10%
6	Vadodara Municipal Corporation	Mar-22	100	Water supply/ sewerage	7.15%	5	AA+(INDRA), AA (CRISIL)	6.06%	1.09%
7	Ghaziabad Municipal Corporation	Apr-21	150	Sewerage	8.10%	10	AA(INDRA), AA (BWR)	6.16%	1.94%
8	Lucknow Municipal Corporation	Nov-20	200	Water supply	8.50%	10	AA(INDRA), AA (BWR)	5.86%	2.64%
9	Ahmedabad Municipal Corporation	Jan-19	200	Sewerage	8.70%	5	AA+(CRISIL), AA+(IRRPL)	7.31%	1.39%
10	Surat Municipal Corporation	Feb-19	200	Sewerage	8.68%	5	AA+(CRISIL), AA+(IRRPL)	7.07%	1.61%
11	Greater Hyderabad Municipal Corporation	Aug-19	100	Roads	10.23%	10	AA(CARE), AA(IRRPL)	6.38%	3.85%
12	Greater Hyderabad Municipal Corporation	Feb-18	200	Roads	8.90%	10	AA(CARE),	7.52%	1.38%
13	Greater Hyderabad Municipal Corporation	Aug-18	195	Roads	9.38%	10	AA(CARE),	7.76%	1.62%
14	Indore Municipal Corporation	Jun-18	140	Water supply	9.25%	10	AA+ (INDRA), AA (BWR)	7.83%	1.42%
15	APCRDA	Jul-18	2000	Development of Amravati	10.32%	10	A+/AA-	0.00%	0.00%
16	Bhopal Municipal Corporation	Sep-18	175	Water supply/ sewerage	9.55%	10	AA(BWR), AA(ACUTE)	7.93%	1.62%
17	Vishakhapatnam Municipal Corporation	Dec-18	80	Sewerage	10.00%	10	AA(IND),	7.30%	2.70%
18	Pune Municipal Corporation	Jun-17	200	Water supply	7.59%	10	AA+(CARE),	6.49%	1.10%
19	Tamil Nadu State Government (TNWSPF)	2017	80	Water/sanitation	8.25%	12	AA	6.60%	1.65%
20	Tamil Nadu State Government (TNWSPF)	2013	51	Water/sanitation				–	–

S. no.	Municipal Corporation/ Entity	Issuance date	Size (INR Cr)	Use of proceeds	Coupon rate	Term (years)	Bond rating	Comparative G-sec	Indicative spread
21	Tamil Nadu State Government (TNWSPF)	2012	51	Water/sanitation				–	–
22	Vishakhapatnam Municipal Corporation	Sep-10	30	Water supply	9.50%	10	AA-,	–	–
23	Tamil Nadu State Government (TNWSPF)	2010	83.19	Water/sanitation				–	–
24	Karnataka Water and Sanitation Pooled Fund	2010	300	Water/sanitation				–	–
25	Tamil Nadu State Government	2008	6.7	Water/sanitation				–	–
26	Nagpur Metropolitan Water Supply and Sewerage Board	Mar-07	21.2	Water supply	7.75%		AA	–	–
27	Karnataka Water and Sanitation Pooled Fund	2005	100	Water supply	5.95%			–	–
28	Ahmedabad Municipal Corporation	2005	100	Water supply				–	–
29	Chennai Municipal Corporation	Mar-05	45.8	Roads	5.4%			–	–
30	Chennai Metropolitan Water Supply and Sewerage Board	2005	50	Water supply				–	–
31	Chennai Metropolitan Water Supply and Sewerage Board	2004	42	Water supply	5.20%	7		–	–
32	Vishakhapatnam Municipal Corporation	2004	20	Water supply	7.75%			–	–
33	Vishakhapatnam Municipal Corporation	2004	50	Water supply				–	–
34	Ahmedabad Municipal Corporation	2004	58	Water supply				–	–
35	Vishakhapatnam Municipal Corporation	2004	50	Water supply				–	–
36	Vishakhapatnam Municipal Corporation	2004	20	Water supply	7.75%		AA-,	–	–
37	Greater Hyderabad Municipal Corporation	2003	82.5	Roads				–	–
38	Hyderabad Metropolitan Water Supply and Sewerage Board	2003	50	Water supply				–	–
39	Chennai Metropolitan Water Supply and Sewerage Board	2003	42	Water supply				–	–

S. no.	Municipal Corporation/ Entity	Issuance date	Size (INR Cr)	Use of proceeds	Coupon rate	Term (years)	Bond rating	Comparative G-sec	Indicative spread
40	Tamil Nadu State Government (TNWSPF)	2002	30.4	Water supply	9.20%	15		–	–
41	Ahmedabad Municipal Corporation	Mar-02	100	Water supply/ sewerage	9%			–	–
42	Nashik Municipal Corporation	2002	50	Sewerage	9%			–	–
43	Nagpur Municipal Corporation	Nov-01	50	Water supply	13%		LAA-,	–	–
44	Madurai Municipal Corporation	Mar-01	30	Roads	12.25%		LA+(SO),	–	–
45	Tamil Nadu Urban Development Fund	2000	110	Water supply	11.85%	5	AA+(SO) to AAA(SO),	–	–
46	Indore Municipal Corporation	2000	10	Roads	13%		LA+(SO),	–	–
47	Nashik Municipal Corporation	May-99	100	Water supply/ sewerage	14.75%		AA(SO),	–	–
48	Ludhiana Municipal Corporation	Sep-99	10	Water supply/ sewerage	13.50%		LAA(SO),	–	–
49	Ahmedabad Municipal Corporation	Jan-98	100	Water supply/ sewerage	14%		AA(SO),	–	–
50	Bangalore Municipal Corporation	1997	125	Water supply/ sewerage/roads	13%		A-,	–	–

Source: CEEW-GFC compilation

Note: S. No. 1-19 considered for analysis barring S. No. 15.

Green bonds Green potential bonds Non-green bond

Acronyms

APCRDA	Andhra Pradesh Capital Region Development Authority
ADB	Asian Development Bank
AFOLU	Agriculture, Forestry and Other Land Use
AMRUT	*Atal Mission for Rejuvenation and Urban Transformation*
AUM	Assets Under Management
bps	Basis Points
BSE	Bombay Stock Exchange
CAFO	Chief Accounts and Finance Officer
CAG	Comptroller and Auditor General
CRISIL	Credit Rating Information Services of India Limited
CSO	Civil Society Organisation
DEA	Department of Economic Affairs
DFI	Development Finance Institution
DSCR	Debt Service Coverage Ratio
ERP	Enterprise Resource Planning
EPFO	Employees' Provident Fund Organisation
ESG	Environmental, Social, and Governance
EWS	Early Warning System
FD	Fixed Deposit
FPI	Foreign Portfolio Investor
G-Sec	Government Security
GIS	Geographic Information System
GoI	Government of India
GDP	Gross Domestic Product
HUDCO	Housing and Urban Development Corporation
ICMA	International Capital Market Association
IDF	Infrastructure Development Fund
ILMDS	Issue and Listing of Municipal Debt Securities

IMC	Indore Municipal Corporation
INR	Indian Rupee
JNNURM	*Jawaharlal Nehru National Urban Renewal Mission*
LIC	Life Insurance Corporation
MC	Municipal Corporation
MDB	Multilateral Development Bank
MIS	Management Information Systems
MoHUA	Ministry of Housing and Urban Affairs
NAC	Notified Area Council
NIUA	National Institute of Urban Affairs
NMAM	National Municipal Accounts Manual
NSE	National Stock Exchange
O&M	Operation and Maintenance
PFDF	Pooled Finance Development Fund
PRI	Principles for Responsible Investment
PSU	Public Sector Undertaking
RE	Renewable Energy
RISE	Reform, Identify, Strengthen, Engage
RBI	Reserve Bank of India
SDL	State Development Loan
SFC	State Finance Commission
SEBI	Securities and Exchange Board of India
SGB	Sovereign Green Bonds
SPM	Structured Payment Mechanism
TNUDF	Tamil Nadu Urban Development Fund
ULB	Urban Local Body
UNFCCC	United Nations Framework Convention on Climate Change
US Treasury	United States department of the Treasury
VMC	Vadodara Municipal Corporation

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Conservative estimates place the muni green bond potential from ~USD 2.5 to 7 billion over varying timelines through 2030.

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