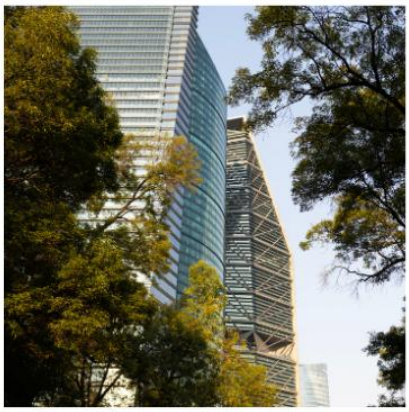
PROSPECT





Learning Handbook on Green Bonds

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About the project

PROSPECT aims to strengthen the capacity of local and regional authorities (LRAs) across Europe to implement sustainable energy and climate actions by reducing reliance on public funding and increasing the use of innovative financing schemes (e.g., one-stop-shops, energy agencies, energy communities). The project offers a peer-to-peer Capacity Building Programme (CBP) tailored to the needs and time constraints of LRAs, available in multiple languages and structured in adaptable learning modules. Through large-scale outreach, including very small and remote LRAs, PROSPECT CUBE acts as an entry point to EU programmes and financing opportunities for authorities with limited experience in the field.

PROSPECT CUBE builds upon two successful Horizon 2020 initiatives: PROSPECT (2017–2020) and PROSPECT+ (2022–2025).

Disclaimer

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List of abbreviations

Abbreviation	Description
CBI	Climate Bonds Initiative
CO_2	Carbon Dioxine
DFI	Development Financial Institution
EE	Energy Efficiency
EIB	European Investment Bank
EPC	Energy Performance Contracting
ELENA	European Local Energy Assistance
ESG	Environmental, Social and Governance
EU	European Union
EuGB	European Green Bond
EU GBS	EU Green Bond Standard
EV	Electric Vehicle
ESG	Environmental, Social and Governance
FTE	Full-Time Equivalent
GHG	Greenhouse Gas
ICMA	International Capital Market Association
KPI	Key Performance Indicator
LRA	Local and Regional Authority
MOE	Municipally Owned Enterprise
MW	Megawatt
MWh	Megawatt-Hour
PFM	Public Financial Management
PV	Photovoltaic
RES	Renewable Energy Sources
SECAP	Sustainable Energy and Climate Action Plan
SLB	Sustainability-Linked Bond
SPO	Second-Party Opinion
SPV	Special Purpose Vehicle
tCO_2e	Tonnes of Carbon Dioxide Equivalent

1. Introduction

Delivering the energy transition and achieving climate neutrality requires substantial, sustained investment in sustainable infrastructure, energy systems, and climate resilience measures. Local and regional authorities (LRAs) are expected to drive this effort by planning and executing ambitious energy and climate projects. However, securing long-term financing remains a major challenge for many of them.

In recent years, Green Bonds have emerged as a powerful instrument to channel capital directly into projects with positive environmental impacts. By raising debt and earmarking proceeds strictly for eligible green investments, Green Bonds fund sustainable infrastructure projects while enhancing transparency and investor confidence. Their rapid development has been further driven by the growing integration of Environmental, Social and Governance (ESG) considerations into financial markets, as well as by the rise of international standards and regulatory frameworks promoting sustainable finance practices.

For LRAs, Green Bonds offer a prime opportunity to diversify funding, mobilise additional investment, and execute strategic climate priorities. Yet, successful issuance demands rigorous preparation - including building a credible project pipeline, establishing transparent governance arrangements, ensuring robust reporting, and aligning with recognised sustainable finance principles. Ultimately, while Green Bonds provide a distinct strategic advantage, their success hinges on strong institutional capacity, sharp financial planning, and a clear long-term investment strategy.

1.1. Purpose of this handbook

This handbook aims to support LRAs in understanding and exploring the potential role of Green Bonds within broader financing strategies for sustainable energy, climate, and environmental investments. It introduces the key principles, characteristics, and operational dimensions of Green Bonds, while explaining how these instruments can be structured, implemented, and aligned with sustainability objectives and reporting requirements.

Building on experience from the PROSPECT initiative and lessons learned from Green Bond practices across different institutional and market contexts, the handbook combines conceptual explanations with practical implementation-oriented guidance. In doing so, it seeks to help LRAs better explore the opportunities, requirements, and limitations associated with Green Bond financing, assess their applicability within local investment strategies, and identify suitable governance and operational approaches adapted to their specific needs and capacities.

1.2. Target audience

This handbook is particularly relevant for LRAs seeking to better understand how Green Bonds can support long-term investment planning and the mobilisation of capital for green infrastructure projects. More specifically, it may be useful for:

- Elected representatives and strategic planners, involved in shaping local climate, sustainability, and infrastructure priorities.
- Municipal financial services and budget departments, responsible for evaluating financing options, debt structures, and investment planning considerations.
- Energy, climate, and infrastructure experts, supporting the identification and development of projects with potential eligibility for Green Bond financing.
- Legal and regulatory professionals, contributing to the preparation of issuance frameworks and compliance with applicable financial and reporting requirements.
- Public agencies, energy agencies, and intermediary organisations, facilitating project preparation, technical assistance, and coordination activities.
- Financial institutions, investors, and funding organisations, interested in sustainable finance instruments and green investment portfolios.
- Public utilities and municipal companies, involved in delivering sustainable infrastructure and climate-related investments.

In addition, it is addressed to a broad range of stakeholders, including consultants, project developers, ESCOs, and other organisations actively involved in the preparation, financing, management, and implementation of sustainable energy, climate, and environmental initiatives at local and regional level.

1.3. How to use this handbook

This handbook is intended both as an introductory guide and as a practical resource for LRAs and other stakeholders exploring the role of Green Bonds in sustainable investment planning. Its content is structured to progressively present the main concepts, governance arrangements, operational requirements, and implementation considerations associated with Green Bond financing, while combining conceptual explanations with practical insights and illustrative examples from different institutional and market contexts.

Ultimately it is designed to support readers with varying levels of experience and may be used either as a complete learning resource or as a reference document for specific topics.

2. Understanding green bonds

Green Bonds are debt instruments designed to finance or refinance projects with positive environmental and climate impacts. Similar to conventional bonds, they enable issuers to raise capital through debt markets, committing to repay the principal with interest over a defined period. Their distinguishing feature lies in the dedicated use of proceeds, which are earmarked exclusively for eligible green investments aligned with predefined environmental objectives (ICMA, 2025; IFC, 2020).

Unlike grants or concessional financing schemes, Green Bonds do not provide subsidised financing conditions or reduce repayment obligations. Instead, they operate as market-based instruments mobilising private and institutional capital towards green investments while strengthening transparency, accountability, and sustainability reporting practices.

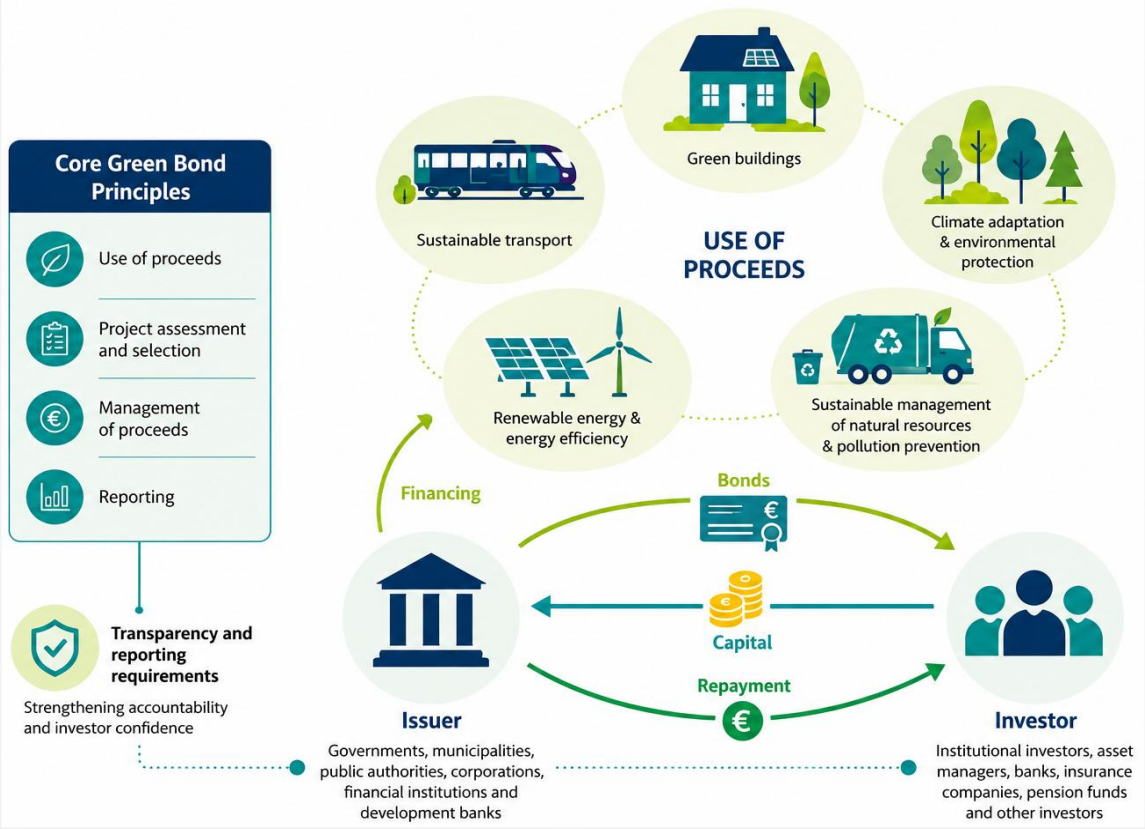

Figure 1. The Green bond ecosystem and its core operational components

For LRAs, Green Bonds can unlock large-scale financing for sustainable infrastructure by connecting local investment priorities with a broader pool of institutional investors. However, successfully accessing this market requires more than political ambition alone. It ultimately depends on the issuer's institutional

readiness - particularly its ability to establish robust a governance structures, ensure transparent reporting practices, and maintain a credible pipeline of eligible green projects (Baldi & Ferri, 2022; Roch et al., 2025).

2.1. How green bonds work in practice?

Although Green Bond schemes may vary depending on the issuer profile, financing objectives, and institutional setting, most follow a common operational sequence combining project preparation, financial structuring, market issuance, and post-issuance monitoring and reporting. The process generally begins with identifying green projects aligned with strategic local priorities and recognised eligibility criteria. Public authorities or issuing entities assess their investment needs, map out project pipelines, and define the environmental scope of the bond based on expected long-term impacts (European Commission, 2020; GCA, 2021).

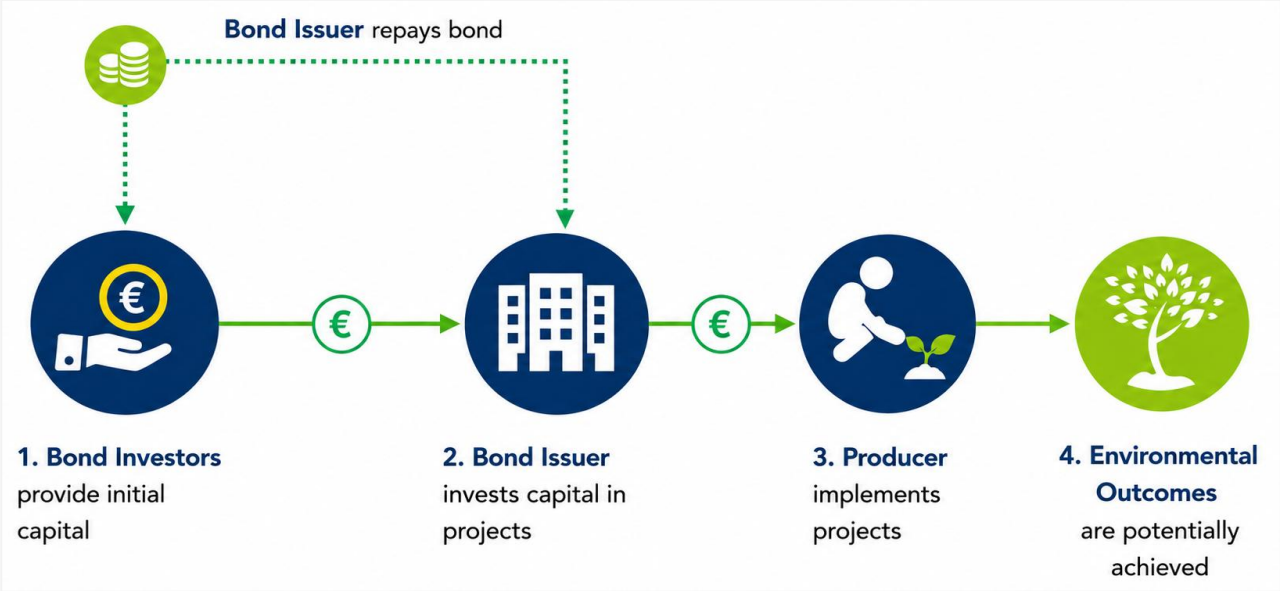

Figure 2. Illustrative representation of the standard operational flow of a Green Bond scheme

Following project selection, the issuer develops a formal Green Bond framework describing:

- the categories of eligible investments;
- the internal process for project evaluation and selection;
- the mechanisms for managing and allocating bond proceeds; and
- the reporting commitments associated with the issuance.

To strengthen investor confidence, issuers commonly secure an external review or second-party opinion (SPO) to verify alignment with international sustainability standards, and upon verification they proceed with the financial structuring and market preparation of the transaction, typically in collaboration with legal advisors, financial underwriters, and environmental experts. This includes, pricing the bond,

preparing the required legal documentation, and marketing the offering to investors prior to issuance on capital markets, enabling the issuer to raise the necessary capital (ADB, 2021; ICMA, 2025; IFC, 2020).

After successful issuance, proceeds are ring-fenced and allocated to the selected projects with issuers generally expected to maintain continuous reporting throughout the bond lifecycle on:

- the allocation of the proceeds; and
- the actual environmental impacts achieved through the financed activities.

These ongoing obligations constitute one of the defining characteristics of Green Bonds, reinforcing market credibility, mitigating greenwashing risks, and maintaining long-term investor confidence and accountability (European Commission, 2020; GCA, 2021; IFC, 2020).

2.2. Arrangements, types and characteristics

Although Green Bonds follow a common financing logic, their practical implementation can vary significantly across institutional and market contexts. Differences may arise in terms of the organisational structure of the issuance, the role of the issuing entity, the financial structure of the bond, and the governance and reporting mechanisms supporting implementation (Clifford Chance, 2023; Lukács, 2025; Treglia, 2026).

Understanding these dimensions is important for LRAs seeking to accurately match a bond design with their institutional capacities, local investment priorities, and broader financial objectives.

2.2.1. Arrangements

Green Bond arrangements define the organisational and financing structures through which bond proceeds are raised, managed, and allocated to eligible green investments. Reflecting these factors, the most common configurations - beyond the standard standalone model - include:

(i) Sovereign issuance arrangements, under which capital is raised at the national level and distributed to regional or local green projects.

(ii) Municipal or regional issuance arrangements, involving direct bond issuance by the LRA itself, using its own balance sheet or revenue streams.

(iii) Development bank-supported arrangements, involving issuances that are backed, guaranteed, or structured in partnership with international or national development financial institutions (DFIs).

(iv) Aggregated or pooled issuance arrangements, referring to joint issuances where multiple smaller LRAs bundle their projects together to achieve market scale.

(v) Corporate or utility-led arrangements, where issuances are driven by municipally owned enterprises, public utilities, or private partners delivering public services.

(vi) Special Purpose Vehicle (SPV)-based arrangements, where a dedicated legal entity is created solely to issue the bond and ring-fence the specific green assets or project revenues.

Each of these arrangements is presented in more detail below, together with its key features, implementation requirements, advantages, and limitations.

Focus Box 1: If you are a smaller LRA, start here

While all of the arrangements presented in the following subsections can support Green Bond financing, not all are equally suitable for smaller LRAs. In many cases, direct municipal issuance may be difficult due to limited project scale, administrative capacity, or market access requirements.

Smaller LRAs may therefore wish to first explore:

- Development bank-supported arrangements (Section 2.3.1.3), where development financial institutions provide structuring support, guarantees, or financing assistance.
- Aggregated or pooled issuance arrangements (Section 2.3.1.4), where multiple authorities combine projects and financing needs into a single issuance, helping achieve the scale required for capital market access.

These arrangements often represent the most realistic pathways for smaller authorities seeking to access Green Bond financing while sharing costs, risks, and administrative requirements.

2.2.1.1. Sovereign issuance arrangements

Sovereign Green Bonds represent capital market instruments executed by a national treasury or sovereign wealth fund. Rather than financing localised assets directly, these macro-issuances aggregate national budgetary allocations to fund large-scale, cross-regional public infrastructure and environmental programmes. For LRAs, sovereign Green Bonds do not typically provide direct access to capital markets. Instead, national governments act as the primary issuing authority, redistributing mobilised capital through national climate funds, green subsidies, co-financing schemes, or other public investment programmes supporting local sustainable projects (European Commission, 2020; ICMA, 2025).

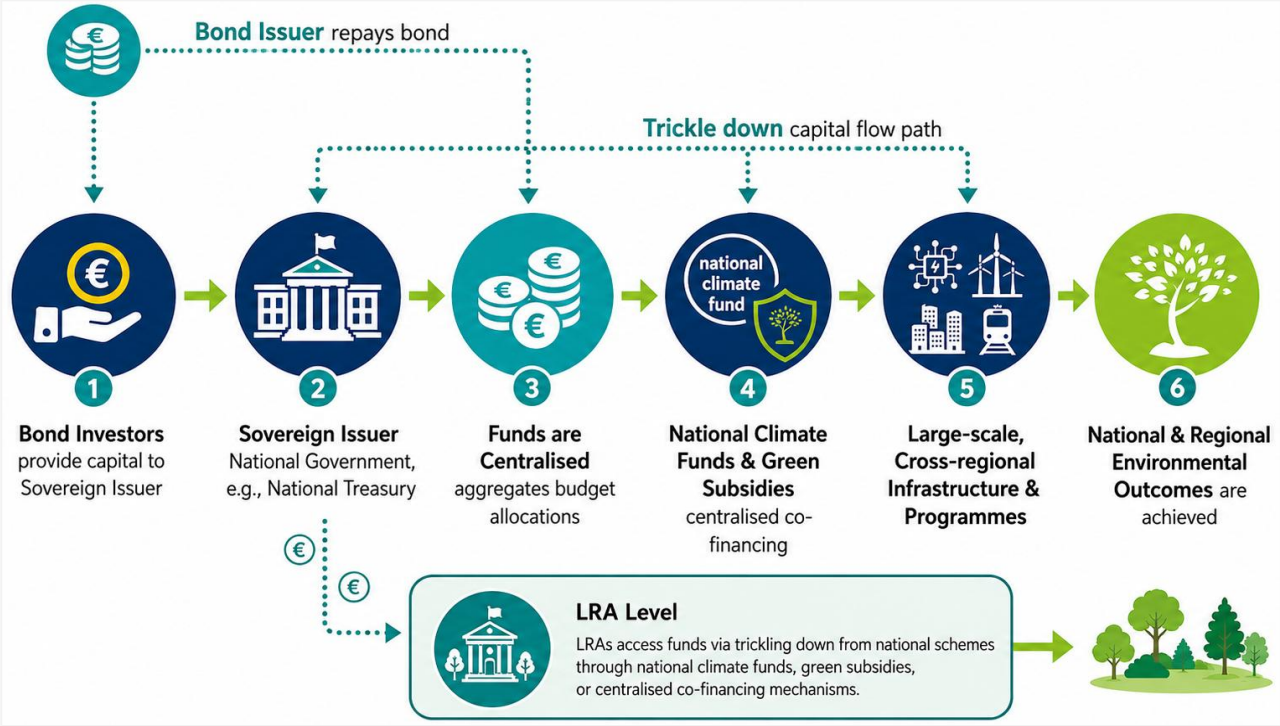

Figure 3. Illustrative representation of a sovereign Green Bond scheme

Conditions

- A strong sovereign credit rating and predictable macroeconomic climate.
- Comprehensive national climate action plans or codified green transition strategies.
- A high-volume portfolio of public investment programmes capable of absorbing large capital inflows.
- Advanced public financial management (PFM) tracks to support rigorous macroeconomic reporting.

Advantages

- Secures maximum investor demand and deep market visibility.
- Mobilises benchmark-setting volumes of institutional capital.
- Minimises borrowing costs due to the ultimate credit backing of the state.
- Establishes a clear national yield curve and standardised domestic green reporting baselines.

Limitations

- Demands intensive, multi-layered interministerial coordination.
- Subject to severe political scrutiny regarding public debt expansion.
- Requires exhaustive macroeconomic impact and sustainability disclosure tracking.
- Offers LRAs zero direct control over capital distribution or project speed.

Focus Box 2: Key considerations on sovereign Green Bonds

Sovereign Green Bonds are commonly used to support investments in sustainable infrastructure, energy transition measures, low-carbon transport, and broader public climate strategies. Beyond asset financing, they serve a vital macro-structural purpose: establishing the liquid benchmarks, reporting taxonomies, and verification protocols that commercial and municipal issuers need to build market confidence within that nation.

2.2.1.2. Municipal or regional issuance arrangements

Under this decentralised framework, cities, regions, or provinces circumvent national intermediaries to enter capital markets as direct debt issuers.

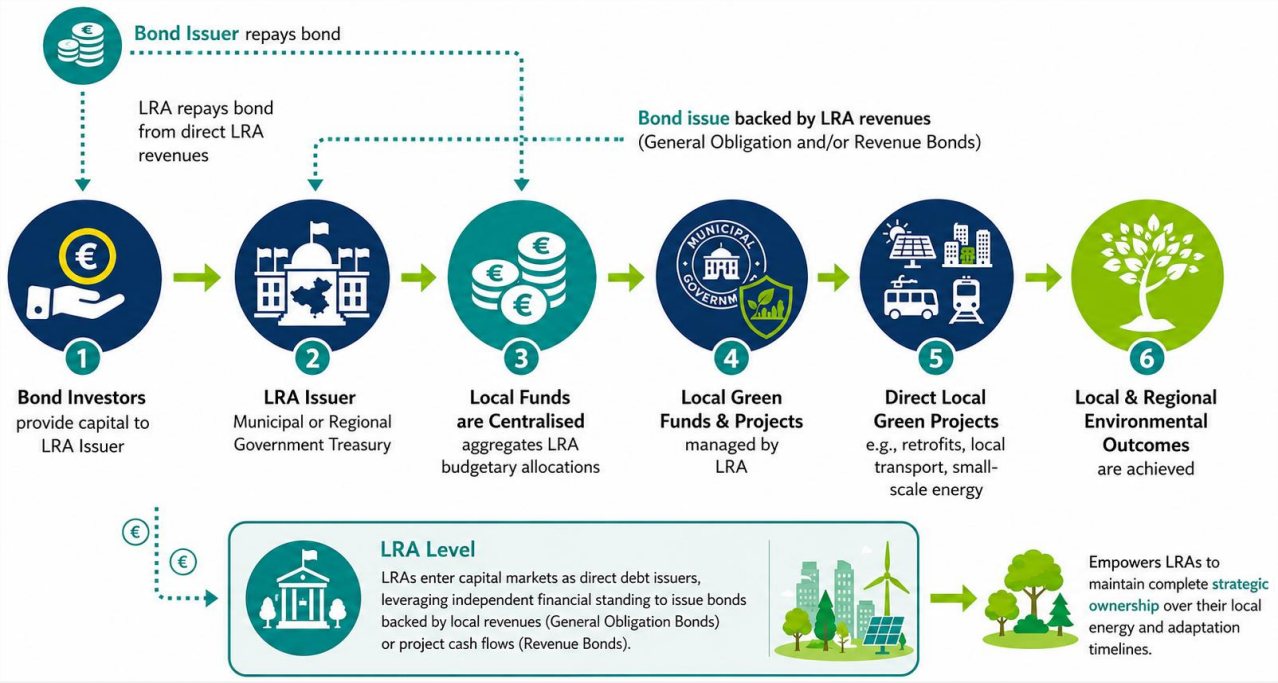

Figure 4. Illustrative representation of a municipal or regional Green Bond scheme

This arrangement allows an LRA to leverage its independent financial standing, backing the bond issue either through general public tax revenues (General Obligation Bonds) or cash flows generated by the

specific green assets being constructed (Revenue Bonds). This empowers LRAs to maintain complete strategic ownership over their local energy and adaptation timelines (Baldi & Ferri, 2022; IFC, 2020).

Conditions

- Independent, legally verified borrowing authority and fiscal autonomy.
- A robust municipal credit profile or access to credit-enhancement mechanisms.
- A localised, mature pipeline of environmentally eligible capital projects.
- Adequate internal capacity to manage continuous post-issuance investor disclosure.

Advantages

- Grants complete local autonomy over investment scheduling and sector prioritisation.
- Amplifies the public visibility and market prestige of local climate action plans.
- Establishes a direct, long-term relationship with global sustainable finance institutions.
- Diversifies municipality's capital away from traditional, restrictive commercial bank loans.

Limitations

- Imposes heavy administrative strain and technical setup costs on local staff.
- Incurs substantial fixed legal, underwriting, and independent verification expenses.
- Demands specialized, long-term internal financial and climate-accounting expertise.
- Excludes smaller municipalities that fall short of minimum market size requirements.

Focus Box 3: Key considerations on municipal or regional Green Bonds

Municipal or regional Green Bond issuance is generally more suitable for LRAs with established governance structures, sufficient project scale, and prior experience in long-term financial planning or capital market operations. For mature LRAs, it acts as a transformative tool to convert high-level sustainable energy and climate action plans (SECAPs) into legally ring-fenced, independently funded infrastructure realities.

2.2.1.3. Development bank-supported arrangements

This collaborative model bridges the gap between public climate ambitions and capital market barriers through the intervention of multilateral or national DFIs. Instead of forcing an under-resourced LRA to navigate complex market entries alone, the development bank steps in to de-risk the process. The DFI can act as a direct co-investor, provide technical assistance to design the bond framework, or extend credit guarantees that artificially elevate the bond's final credit rating, making it attractive to global investors (GCA, 2021; IFC, 2020).

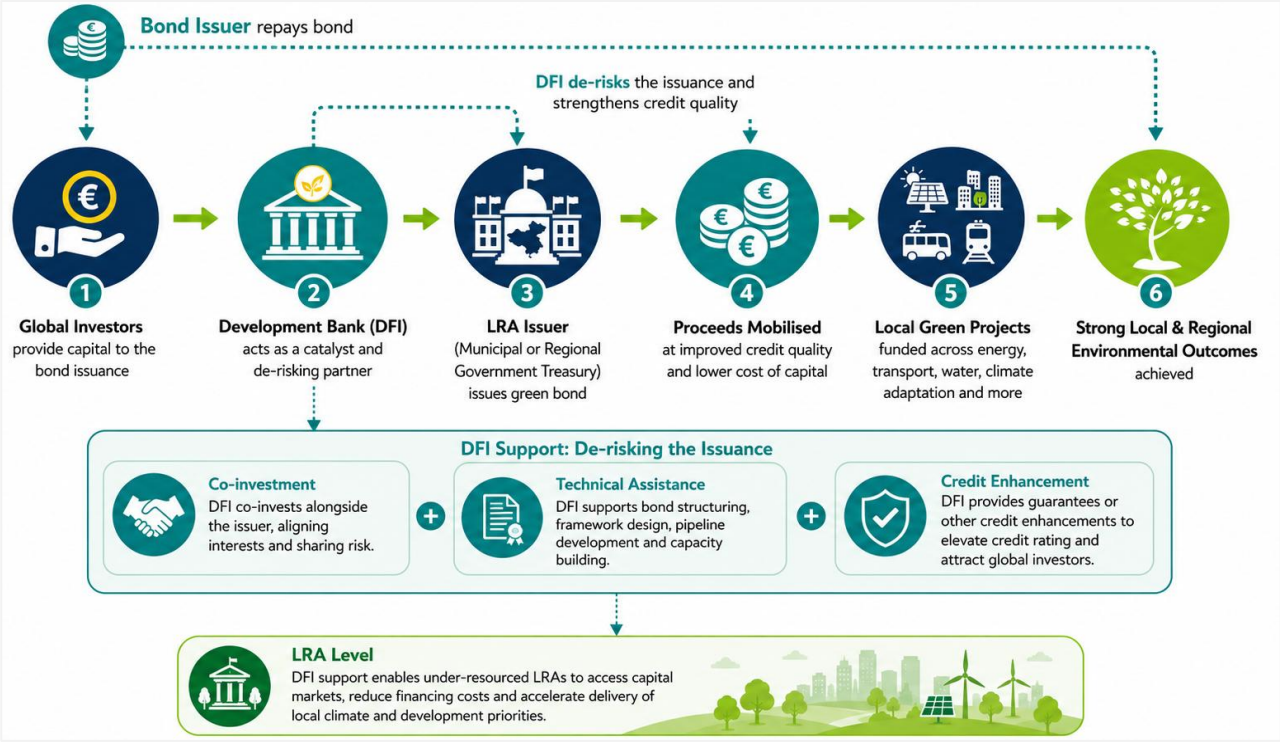

Figure 5. Illustrative representation of a development bank-supported Green Bond scheme

Conditions

- Active alignment with open DFI technical assistance or climate-finance programs.
- A project pipeline that rigorously meets the strict environmental guardrails of the supporting bank.
- Formalised, transparent cooperation agreements between the LRA and the financial partner.
- Willingness to adopt external procurement, anti-corruption, and environmental monitoring rules.

Advantages

- Reduces the technical, legal, and financial entry barriers for first-time municipal issuers.
- Injects instant institutional credibility, attracting conservative institutional investors.
- Improves borrowing terms and lowers interest rates via DFI credit enhancements and guarantees.
- Provides fully subsidised access to specialised financial engineering and environmental experts.

Limitations

- Creates an institutional dependency on external approval timelines and banking structures.
- May involve lengthy, highly bureaucratic evaluation and due diligence phases.
- Restricts local flexibility regarding project modifications or secondary asset selection.
- Requires adherence to dual reporting tracks (both market standards and specific DFI criteria).

Focus Box 4: Key considerations on development bank-supported Green Bonds

Development bank-supported Green Bonds can be particularly valuable for LRAs entering Green Bond markets for the first time or lacking sufficient in-house technical and financial expertise.

By acting as an institutional anchor, DFIs can subsidise the costly "first-mover" friction of framework development and external reviews. This arrangement serves as a practical stepping stone, building internal municipal capacity until LRAs can confidently issue independent debt in later market cycles.

2.2.1.4. Aggregated or pooled issuance arrangements

Aggregated or pooled arrangements solve the problem of fragmented public infrastructure by consolidating multiple small-scale municipal projects into a single, collective bond issuance.

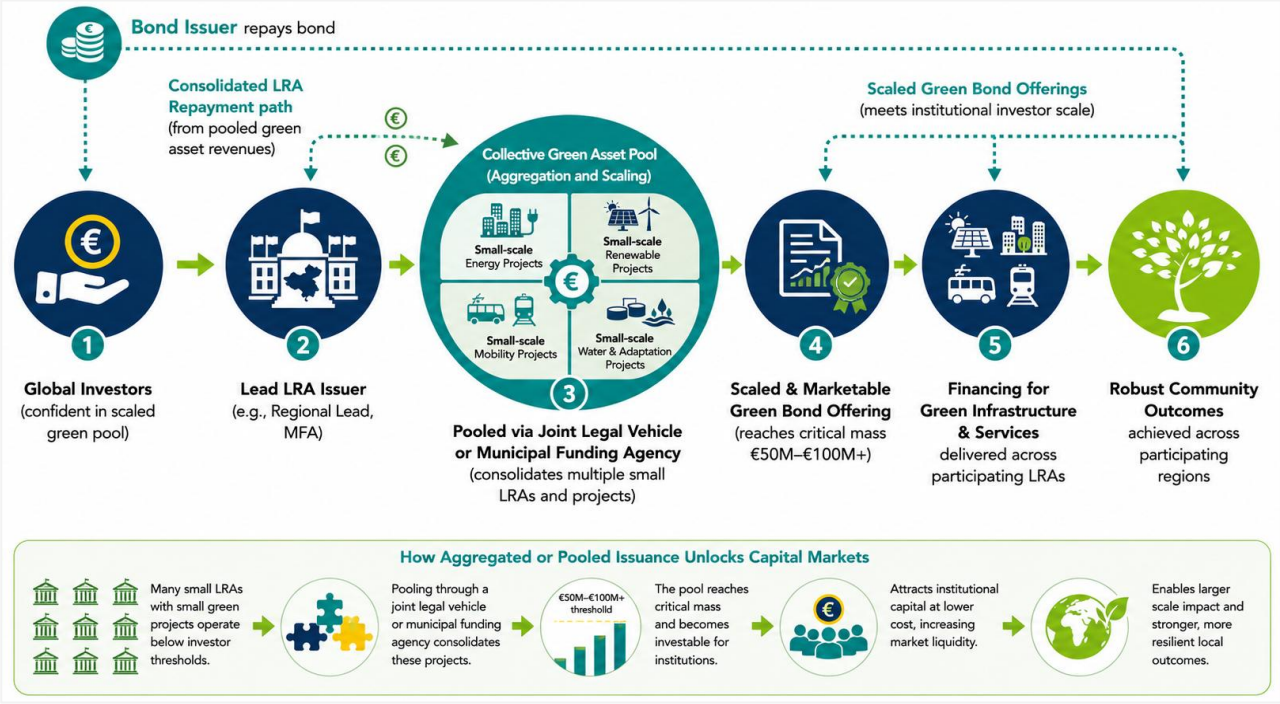

Figure 6. Illustrative representation of an aggregated or pooled Green Bond scheme

Since international institutional investors rarely participate in bond offerings below a certain threshold (often €50M–€100M), individual small LRAs are structurally locked out of the market. By pooling their green

assets through a joint legal vehicle or a centralised municipal funding agency, multiple smaller authorities can jointly achieve the critical mass necessary to attract capital market liquidity (ADB, 2021; ICMA, 2025).

Conditions

- A network of multiple localised green projects with standardised financial characteristics.
- A centralised intermediary entity, joint committee, or municipal agency to manage the pool.
- Harmonised, legally cross-backed reporting and data-collection protocols across all participants.
- Clear legal agreements governing shared debt liabilities and default recourse among the LRAs.

Advantages

- Spreads high fixed issuance and verification costs across multiple participating entities.
- Unlocks elite capital market access for small towns and rural regional authorities.
- Creates a highly diversified, lower-risk asset portfolio for sustainability investors.
- Fosters valuable cross-municipal knowledge sharing and standardised green procurement.

Limitations

- Requires immense political and administrative alignment across distinct local governments.
- Demands complex legal structuring to define default liabilities and payment waterfalls.
- Vulnerable to delays if individual participants suffer from uneven project maturities.
- Increases monitoring complexity of post-issuance impact reporting across scattered locations.

Focus Box 5: Key considerations on aggregated or pooled Green Bonds

Aggregated or pooled arrangements can improve access to Green Bond financing for smaller municipalities by overcoming minimum scale and market access barriers.

To operationalise this configuration effectively, LRAs should look to replicate successful institutional models like municipal funding agencies or regional joint-action agencies. These structures act as permanent aggregators, continuously bundling smaller renewable energy sources (RES) installations, large-scale energy efficiency (EE) building retrofits, sustainable transport initiatives, and local climate adaptation or water management schemes into market-grade, institutional-class bond offerings.

2.2.1.5. Corporate or utility-led arrangements

In this configuration, the issuance of green debt is shifted off the public balance sheet entirely and executed by corporate entities, public-private utilities, or municipally owned enterprises (MOEs).

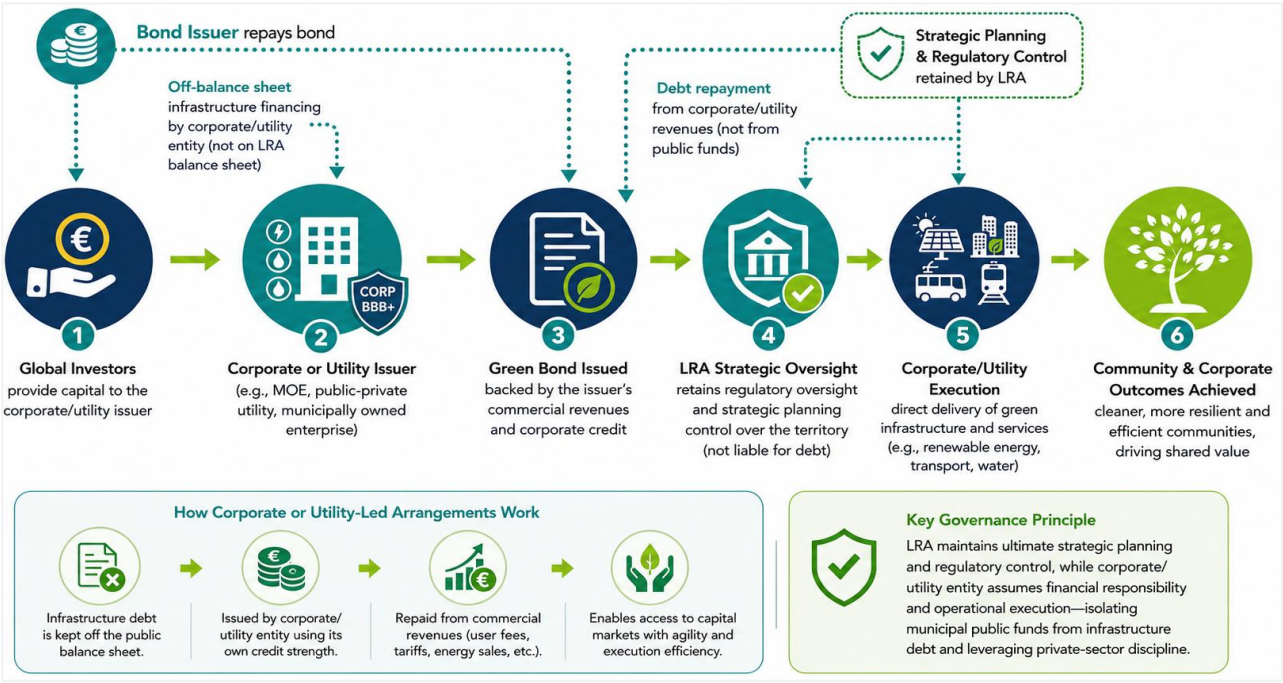

Figure 7. Illustrative representation of a corporate or utility-led Green Bond scheme

While the LRA retains ultimate regulatory oversight and strategic planning control over the territory, the utility company issues the bond based on its own commercial revenues and corporate credit rating. This model isolates municipal public funds from infrastructure debt while tapping into highly agile corporate execution capacities (ADB, 2021; Iberdrola Group, 2025; ICMA, 2025).

Conditions

- A corporate entity or utility with stable, legally predictable tariff- or fee-based revenue streams.
- A commercial balance sheet strong enough to secure an investment-grade corporate rating.
- A clear corporate separation between public policy mandates and commercial financial management.
- Modern corporate governance frameworks capable of managing automated ESG reporting.

Advantages

- Shields the local government's public balance sheet and debt limits from infrastructure liabilities.
- Leverages highly efficient, private-sector corporate procurement and project delivery speeds.
- Accesses specialised corporate debt markets that may be closed to purely political entities.
- Directly links bond repayment to utility tariff revenues generated by the new infrastructure.

Limitations

- Exposes the underlying infrastructure to corporate market fluctuations and refinancing risks.
- Requires strict, highly transparent corporate auditing to prevent greenwashing controversies.
- Limits direct public oversight over daily project execution choices.
- May lead to misaligned priorities if corporate profit motives clash with local social-equity goals.

Focus Box 6: Key considerations on corporate or utility-led Green Bonds

Corporate and utility-led Green Bonds have played a central role in scaling sustainable infrastructure investment across sectors requiring long-term capital-intensive financing. For LRAs, utilising municipally owned utilities or structured concessions allows for the rapid deployment of massive, revenue-generating systems, such as district heating networks, smart grids, and waste-to-energy plants, without triggering public debt ceilings or requiring direct taxpayer mobilisation.

2.2.1.6. SPV-based arrangements

SPV configurations represent the peak of structured project finance. Under this arrangement, PRAs or project promoters establish an entirely independent, bankruptcy-remote legal entity solely to execute a specific infrastructure project.

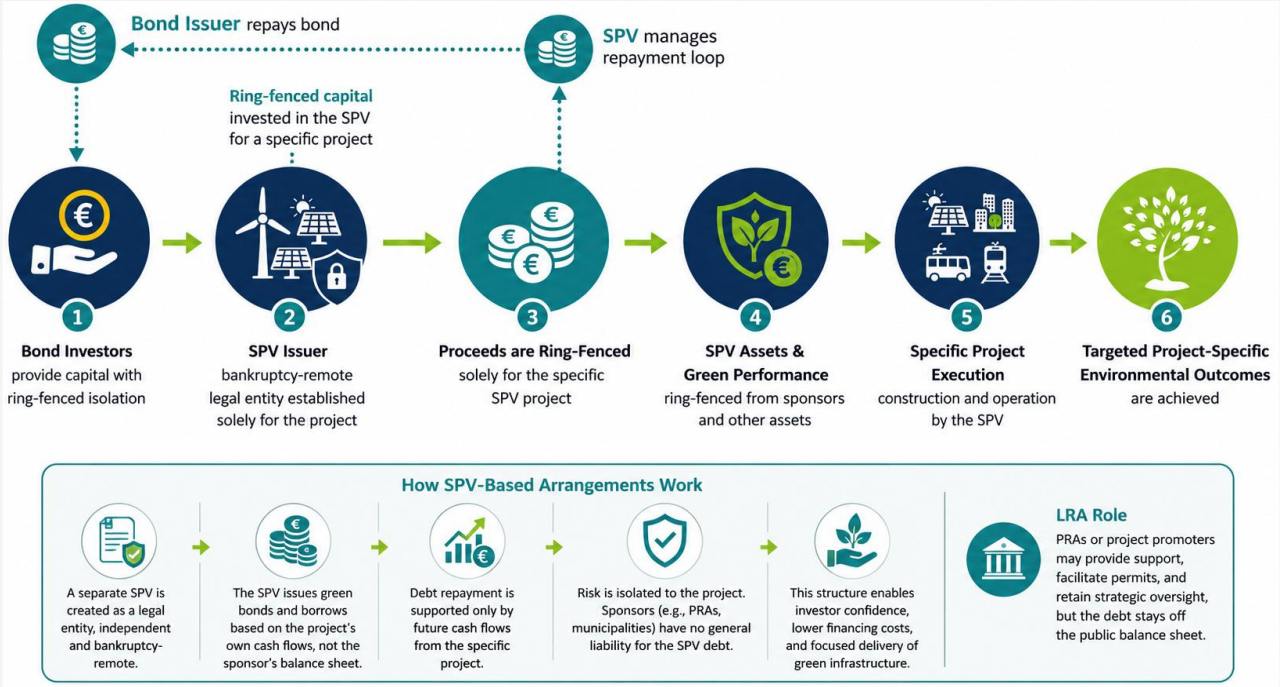

Figure 8. Illustrative representation of an SPV-based Green Bond scheme

The SPV issues the Green Bonds itself, and the debt is backed strictly by the future cash flows of that single project (such as a specific toll road, wind farm, or water treatment facility) rather than the general credit or assets of the sponsoring municipality (EnviroAccounting., 2026; European Commission, 2020; ICMA, 2025).

Conditions

- A large-scale, capital-intensive green infrastructure project with predictable, ring-fenced cash flows.
- A complex web of legally binding, long-term commercial and public contracts.
- Comprehensive risk-allocation frameworks dividing liabilities among builders, operators, and financiers.
- Access to advanced legal and financial engineering expertise to establish the standalone SPV.

Advantages

- Provides total risk segregation, ensuring a project failure cannot bankrupt the sponsoring LRA.
- Offers extreme structural flexibility to blend public grants, private equity, and institutional debt.
- Guarantees absolute financial transparency, as the SPV has no other operational distractions.
- Enables precise, project-specific sustainability monitoring and direct impact measurement.

Limitations

- Incurs exceptionally high upfront legal, administrative, and corporate setup costs.
- Requires a lengthy, highly complex contractual design phase before market launch.
- Demands continuous, specialised financial monitoring to manage isolated liquidity balances.
- Unsuitable for smaller, non-revenue-generating civic projects (e.g., local public parks).

Focus Box 7: Key considerations on SPV-based Green Bonds

SPV-based Green Bonds are most commonly applied in complex infrastructure and public-private partnership structures where dedicated governance and ring-fenced financial management are required. They are widely used in sectors such as renewable energy, energy networks, sustainable mobility, water management, and environmental services.

2.2.2. Types

Beyond the organisational arrangements that define how Green Bond issuance is structured and governed, the practical financing logic of the instrument depends largely on the specific bond type selected.

While most Green Bond structures follow the traditional use-of-proceeds model - where financing is strictly earmarked for eligible green investments - alternative variations have emerged that rely on dedicated revenue streams, project-specific cash flows, or securitised asset portfolios to accommodate different financing structures and risk profiles. At the same time, as sustainable finance markets continue to evolve, additional transition-oriented and performance-based instruments have emerged to support wider

decarbonisation and sustainability objectives, linking financial characteristics to measurable sustainability targets rather than solely to predefined project categories (Baldi & Ferri, 2022; EnviroAccounting., 2026; García-Escobar et al., 2026).

As a result, Green Bonds can take different forms depending on how proceeds are allocated, how repayment obligations are structured, and how financing is linked to underlying projects, assets, or sustainability objectives. Together, these bond types provide public issuers with flexible options for structuring sustainable finance mechanisms according to their investment profile, financing objectives, institutional capacity, and broader market positioning (Di Tommaso et al., 2025; Roch et al., 2025).

Table 1. Overview of the main Green Bond types and their typical applications

Bond type	Main feature	Typical application
Standard green use-of-proceeds bonds	Bond proceeds are earmarked exclusively for eligible green investments, while repayment obligations are backed by the issuer's overall balance sheet and creditworthiness.	Municipal investment programmes, public infrastructure projects, corporate sustainability financing
Green revenue bonds	Repayment is linked primarily to specific revenue streams generated by financed assets or services rather than to the issuer's general balance sheet.	Transport infrastructure, water utilities, energy networks, user-fee-based infrastructure
Green project bonds	Financing is directly associated with a specific green project, with repayment linked largely to project-level cash flows and operational performance.	RES projects, infrastructure investments, large-scale sustainable developments
Green securitised bonds	Bonds are backed by pooled portfolios of green assets, loans, or receivables aggregated into a securitised financing structure.	EE loan portfolios, green mortgages, distributed RES programmes
Sovereign green bonds	National governments issue bonds to finance public expenditures and investment programmes aligned with national climate and sustainability objectives.	National climate investment plans, public infrastructure programmes, energy transition strategies
Climate transition bonds	Financing supports decarbonisation pathways and transition activities for sectors or organisations moving towards lower-carbon operations.	Industrial decarbonisation, hard-to-abate sectors, long-term transition strategies
Sustainability-linked bonds (SLBs)	Bond characteristics are linked to predefined sustainability performance targets rather than to earmarked green investments or specific project categories.	Corporate sustainability strategies, ESG performance programmes, transition-oriented financing frameworks

For LRAs, selecting the optimal Green Bond instrument is not simply a financing decision; it represents a strategic alignment of investment ambition, institutional readiness, and market accessibility. Because each bond type carries different financing logics, repayment structures, and governance implications, the ideal vehicle depends entirely on the authority's priorities, project portfolio, and implementation capacity.

To guide public administrators through this selection process, Figure 9 outlines an indicative decision-support framework.

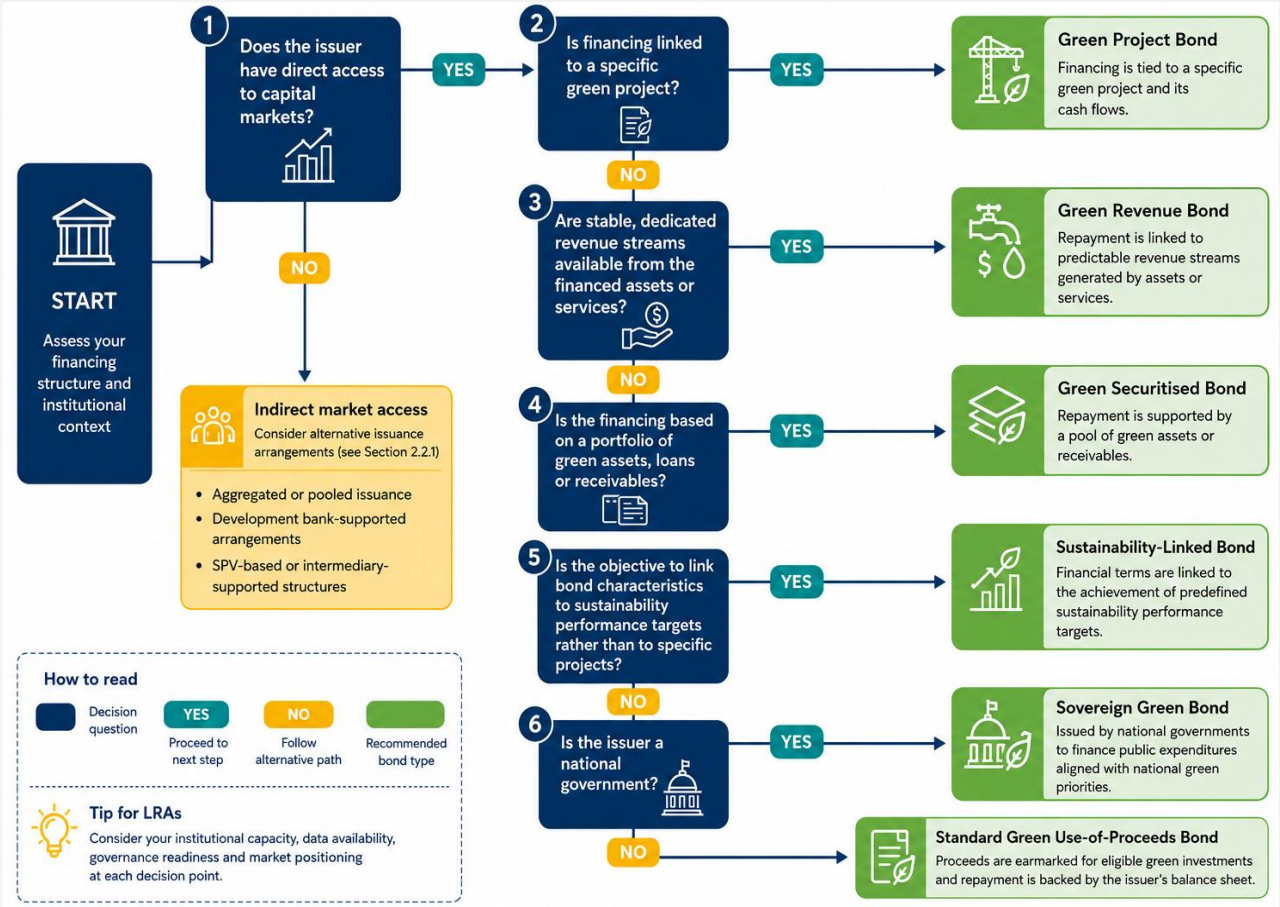

Figure 9. Indicative Green Bond selection pathway based on the issuer profile and investment needs.

2.2.3. Key characteristics

Beyond their specific financing structure, Green Bonds are distinguished by a set of core characteristics, governance principles, and operational prerequisites designed to ensure transparency, credibility, and accountability throughout the bond lifecycle. These elements shape how eligible investments are selected, how proceeds are managed, and how environmental impacts are monitored and reported (European Commission, 2020; ICMA, 2025; IFC, 2020).

Compliance with these requirements is considered vital for strengthening investor confidence, reducing greenwashing risks, and supporting alignment with recognised sustainable finance frameworks.

Table 2. Core characteristics, principles, and implementation prerequisites of Green Bonds

Characteristic/ principle	Main purpose	Practical implications for LRAs
Use of proceeds	Ensures that bond proceeds are allocated exclusively to eligible green investments	Requires clear identification and tracking of eligible projects
Project evaluation and selection	Defines how eligible projects are assessed and approved	Requires transparent governance and project selection criteria
Management of proceeds	Ensures dedicated monitoring and allocation of funds	Requires internal financial management and tracking mechanisms
Reporting and transparency	Supports accountability regarding fund allocation and environmental impacts	Requires regular allocation and impact reporting throughout the bond lifecycle
External review / second-party opinion	Strengthens market credibility and investor confidence	Requires independent verification of framework alignment
Environmental impact measurement	Demonstrates sustainability outcomes achieved through financed investments	Requires monitoring indicators and measurable performance metrics
Governance and institutional capacity	Supports effective coordination and compliance management	Requires internal administrative, legal, and financial expertise
Pipeline maturity	Ensures sufficient scale and continuity of eligible investments	Requires long-term investment planning and project preparation
Market credibility and ESG alignment	Enhances investor trust and market acceptance	Requires alignment with recognised sustainable finance standards and frameworks

The core principles and compliance requirements associated with Green Bonds strengthen market credibility, but also introduce administrative demands that may exceed the immediate capacity of smaller LRAs. As a result, Green Bonds are often assessed alongside conventional commercial and/or concessional financing instruments, balancing transparency and long-term financing potential against transaction complexity and institutional implementation capacity (Cortina et al., 2025; Dogan, 2023; Pinto & Ribeiro, 2026). Ultimately,

selecting the most suitable mechanism requires careful consideration of the operational and financial trade-offs associated with different local investment contexts (Table 3).

Table 3. Comparative overview of Green Bonds, bank loans, and soft loans

Dimension	Green Bonds	Conventional bank loans	Soft loans
Financing source	Capital markets and institutional investors	Commercial banks and lenders	Public institutions and concessional programmes
Main purpose	Financing eligible green investments	General project financing	Supporting investments through preferential terms
Repayment structure	Repayment through predefined bond maturity and coupons	Repayment through lending agreement	Repayment under concessional conditions
Use-of-proceeds requirements	Strict allocation to eligible green projects	Generally unrestricted	Linked to targeted policy objectives
Reporting obligations	High transparency and reporting requirements	Moderate reporting requirements	Programme-dependent reporting requirements
External verification	Commonly requires external reviews	Usually not required	Sometimes required
Investor involvement	Multiple institutional and private investors	Single lender or lending consortium	Public or development-oriented financiers
Market access requirements	Capital market access and issuer credibility	Creditworthiness and lender approval	Eligibility under concessional schemes
Typical project scale	Medium- to large-scale programmes	Small- to medium-scale projects	Small- to medium-scale targeted programmes
Financing conditions	Market-based conditions	Market-based conditions	Preferential or subsidised conditions
Governance complexity	High	Moderate	Moderate
Financing use flexibility	Restricted to eligible green investments	High	Moderate, depending on programme rules
Typical relevance for LRAs	Large investment portfolios and long-term strategies	General infrastructure financing	EE and targeted support programmes

2.3. Green Bonds within the broader sustainable finance ecosystem

In practice, Green Bonds do not represent a stand-alone financing instrument. Especially for LRAs, they are often most effective when embedded within a broader financing and investment strategy. In such cases, while the bond itself enables access to capital markets and facilitates the mobilisation of private and institutional capital, complementary instruments can help authorities strengthen investment readiness, improve project bankability, and overcome technical, financial, and organisational barriers.

Several European and international initiatives can play an important supporting role in this context:

- ELENA (European Local Energy Assistance) provides project development assistance for sustainable energy and climate investments. Support may include feasibility studies, technical assessments, procurement preparation, business planning, financial structuring, and investment pipeline development, helping LRAs prepare projects that are sufficiently mature for large-scale financing (EIB, 2026b).
- InvestEU offers guarantees and risk-sharing mechanisms that improve the bankability of sustainable investments and help attract additional private capital. In some cases, InvestEU-supported projects may form part of broader investment programmes financed through Green Bonds or other capital market instruments (European Union, 2026).
- The European Investment Bank (EIB) plays a key role as financier, advisor, and market enabler for sustainable infrastructure investments across Europe. Beyond providing financing, the EIB supports project preparation, capacity building, and the development of local sustainable finance ecosystems, particularly for public authorities seeking to scale up climate-related investments (EIB, 2026a).
- The Climate Bonds Initiative (CBI) provides a globally recognised certification framework that can complement Second-Party Opinions (SPOs). Certification offers an additional level of assurance regarding the environmental integrity of financed activities and may strengthen investor confidence by demonstrating alignment with science-based climate criteria (CBI, 2026).

Beyond these supporting initiatives, Green Bonds can also be combined with a range of financing instruments and implementation approaches that address specific investment barriers and improve project viability (OECD, 2025; Todeschi et al., 2025). Common examples include:

- Grants and public co-financing mechanisms, which can reduce upfront investment costs and improve the financial viability of projects that may not generate sufficient revenues on their own.
- Guarantees, which help reduce perceived investment risks and can improve access to capital by enhancing the credit profile of projects or issuers.

- Revolving funds, which allow financial resources to be reinvested into successive rounds of sustainable energy and climate projects, increasing the long-term impact of public financing.
- Concessional financing instruments, including preferential loans or public financing facilities offering below-market conditions to support strategic investments and crowd in additional private capital.
- Performance-based financing arrangements, such as Energy Performance Contracting (EPC), where repayments are linked to verified energy savings or environmental performance outcomes, helping improve investment confidence and reduce implementation risks.

Such combinations can help reduce project risks, improve financial viability, and mobilise larger volumes of investment than would be possible through a single financing source alone.

Focus Box 8: Green Bonds as part of a blended financing strategy

While Green Bonds can mobilise significant volumes of capital for sustainable investments, they are rarely used in isolation; Often they form part of a broader financing package.

In practice, they are frequently combined with complementary instruments and support mechanisms that help improve project preparation, reduce investment risks, and enhance financial viability, such as:

- Grants or public co-financing mechanisms, which may help cover upfront costs,
- Guarantees, which can improve creditworthiness,
- Concessional financing, which can reduce financing costs, while
- Revolving funds and Performance-based financing arrangements can strengthen project implementation and long-term sustainability.

In this way, rather than replacing other financing instruments, Green Bonds can serve as a central financing component within a broader investment framework that combines multiple sources of funding and support to maximise impact.

For LRAs, adopting such a blended approach can help mobilise additional capital, improve investment readiness, and facilitate the delivery of larger and more complex sustainable energy and climate projects.

2.4. Why Green Bonds matter? Benefits and added value for LRAs

For many LRAs, Green Bonds represent more than an alternative financing instrument; they provide a strategic mechanism for mobilising large-scale investment while strengthening the credibility, visibility, and long-term structuring of local sustainability strategies (Todeschi et al., 2025).

In practice, by connecting climate and environmental objectives with capital market financing, Green Bonds enable public authorities to diversify funding sources, attract institutional investors, and support the implementation of ambitious infrastructure and transition programmes that may exceed the capacity of conventional municipal financing approaches. At the same time, the governance and reporting requirements associated with Green Bonds can generate broader institutional benefits, encouraging stronger transparency practices, improved project monitoring, and more integrated long-term investment planning across municipal structures (ADB, 2021; Demski et al., 2025; OECD, 2025).

In this context, the added value of Green Bonds for LRAs can be understood across three main dimensions:

(i) Capital mobilisation and financial positioning
(ii) Strategic credibility and policy alignment
(iii) Institutional maturity and ecosystem strengthening

I. Capital mobilisation and financial positioning (financial dimension). Green Bonds can strengthen the financing capacity of LRAs by expanding access to capital markets and improving the visibility of sustainable investment programmes (OECD, 2017; World Bank, 2018). Key benefits include:

- Diversification of financing sources. Green Bonds enable LRAs to complement traditional public borrowing and grant funding with access to institutional and sustainability-oriented investors, reducing dependence on conventional financing channels.
- Access to long-term capital. Through capital market issuance, LRAs may mobilise larger financing volumes suitable for long-term infrastructure and climate investment programmes.
- Potential market advantages and investor demand: Strong demand for sustainable finance products may contribute to oversubscription effects, broader investor participation, and enhanced market visibility for green issuances.
- Financing scalability. Green Bonds can facilitate the aggregation of multiple eligible investments under a single financing structure, supporting larger and more coordinated territorial investment programmes.

II. Strategic credibility and policy alignment (socio-political dimension). Beyond their financing role, Green Bonds can strengthen the strategic positioning of LRAs by reinforcing the credibility and visibility of local sustainability commitments (Baldi & Ferri, 2022; García-Escobar et al., 2026). Key benefits include:

- Strengthening sustainability credibility. Green Bond frameworks and reporting obligations help demonstrate that climate and environmental objectives are integrated into municipal investment planning and financing strategies.
- Improved alignment with climate and energy objectives. Green Bonds can support the implementation of SECAP priorities and broader sustainability strategies by linking financing directly to eligible environmental investments.
- Enhanced stakeholder and investor engagement. Green Bond issuance may improve dialogue with investors, citizens, and external stakeholders by increasing transparency regarding investment priorities and environmental impacts.
- Reputational and communication benefits. Green Bonds can strengthen the external visibility of LRAs and position municipalities as proactive actors within sustainable finance and climate transition markets.

III. Institutional maturity and ecosystem strengthening (operational dimension). The preparation and implementation of Green Bond schemes can also support broader institutional and organisational improvements within LRAs(Dogan, 2023; G20 Sustainable Finance Working Group, 2024; UNFCCC, 2025). Key benefits include:

- Improved governance and transparency practices. Green Bond implementation requires structured allocation, monitoring, and reporting procedures, encouraging stronger financial governance and accountability mechanisms.
- Cross-departmental coordination. The development of Green Bond frameworks often strengthens collaboration between financial, technical, environmental, and planning departments within local administrations.
- Pipeline development and investment planning. Green Bonds encourage LRAs to identify, structure, and prioritise long-term portfolios of eligible projects, supporting more strategic territorial investment planning.
- Local ecosystem strengthening. By engaging financial institutions, technical experts, external reviewers, and project developers, Green Bonds can contribute to the development of more mature local sustainable finance ecosystems capable of supporting future investment pipelines.

2.5. Sector-wide application: When and where Green Bonds can be used?

Green Bonds are most commonly associated with large-scale climate and infrastructure financing. Yet, their operational flexibility allows LRAs to support a broad range of sectoral investments aligned with environmental and sustainability objectives (European Commission, 2020; ICMA, 2025; OECD, 2025).

By earmarking proceeds for eligible green activities, Green Bonds can finance both standalone projects and integrated territorial investments across energy, transport, buildings, environmental services, and urban infrastructure sectors.

In particular, Green Bonds are relevant for investment areas characterised by high upfront capital needs, long asset lifecycles, and strategic public infrastructure requirements. Depending on the institutional structure and financial scale of the programme, they may support either individual flagship projects or aggregated portfolios of smaller interventions implemented under broader municipal sustainability strategies (ADB, 2021; IFC, 2020).

Table 4 provides an indicative overview of the main sectors and investment streams where Green Bonds are commonly applied by public authorities and infrastructure providers.

Table 4. Indicative overview of Green Bond applications across sectors and investment areas

Sector	Indicative applications and typical soft loan structures
Public buildings	Supporting: EE renovations, deep retrofits, rooftop photovoltaic (PV) systems, smart energy management, and low-carbon public buildings
	• Typical structures: Municipal Green Bonds, Sovereign Green Bonds, or Aggregated (pooled) issuance arrangements • Implications for LRAs: Facilitates large-scale renovation of municipal assets and long-term operational savings
Residential sector	Supporting: Large-scale housing renovation programmes, energy-efficient social housing, rooftop solar, and district-level retrofit initiatives
	• Typical structures: Municipal or Securitised Green Bonds, Aggregated financing structures • Implications for LRAs: Supports citizen-oriented transition programmes and scalable residential investment portfolios
Sustainable mobility	Supporting: Public transport electrification, electric vehicle (EV) charging infrastructure, cycling infrastructure, low-emission fleets, and smart mobility systems
	• Typical structures: Municipal Green Bonds, Green revenue bonds, Sovereign Green Bonds • Implications for LRAs: Supports urban mobility transition and long-term transport decarbonisation strategies

Energy infrastructure	Supporting: RES installations, district heating and cooling systems, smart grids, energy storage, and energy communities
	• Typical structures: Project bonds, Utility-led Green Bonds, Development bank-supported arrangements • Implications for LRAs: Enables implementation of capital-intensive energy infrastructure projects
Water and environmental infrastructure	Supporting: Water supply systems, wastewater treatment, flood protection infrastructure, circular economy projects, and environmental restoration
	• Typical structures: Revenue bonds, Sovereign Green Bonds, SPV-based arrangements • Implications for LRAs: Strengthens environmental resilience and long-term infrastructure sustainability
Urban regeneration and public infrastructure	Supporting: Sustainable urban regeneration, green public spaces, climate-resilient infrastructure, and integrated territorial development projects
	• Typical structures: Municipal Green Bonds, Aggregated (pooled) issuance arrangements or blended financing structures • Implications for LRAs: Enhances integrated urban sustainability and long-term territorial planning
Cross-sectoral investment programmes	Supporting: Aggregated investment portfolios combining multiple sectors and beneficiary groups under integrated sustainability strategies
	• Typical structures: Sovereign Green Bonds, Aggregated (pooled) issuance arrangements or blended financing structures • Implications for LRAs: Enables coordinated territorial investment planning and scalable programme implementation

Focus Box 9: When and where Green Bonds add value?

Green Bonds are particularly valuable in situations where LRAs need to mobilise substantial long-term financing for strategic sustainability investments that exceed the scale or flexibility of conventional municipal funding mechanisms.

Their added value becomes strongest when public authorities already possess:

- a mature pipeline of eligible green projects,
- clear sustainability and investment strategies,
- sufficient governance and reporting capacity,
- the ability to aggregate investments into coherent financing programmes.

In practice, Green Bonds are most effective for:

- large-scale infrastructure and urban transition programmes,
- multi-sector investment portfolios,
- long-term climate and energy strategies,
- projects requiring high upfront capital with long operational lifecycles.

On the other hand, they are generally less suitable for isolated small-scale projects, short-term financing needs or authorities lacking sufficient administrative, financial, or reporting capacity to support capital market issuance and ongoing compliance obligations.

2.6. Main stakeholders involved

Unlike conventional lending structures primarily based on bilateral borrower-lender relationships, Green Bond issuance requires the interaction of multiple specialised stakeholders contributing across financial structuring and underwriting, governance and compliance, project preparation and aggregation, external verification and reporting, and investment mobilisation (ICMA, 2025; Treglia, 2026).

Within this ecosystem, participating actors involve financial, institutional, technical, and market stakeholders, who can broadly be grouped into two interconnected categories:

- Issuance and governance actors, responsible for structuring, issuing, managing, verifying, and administering the Green Bond framework and financing process.
- Investment and implementation actors, responsible for financing, executing, monitoring, or benefiting from the underlying green investments supported through bond proceeds.

The interaction between these stakeholders is essential for ensuring market credibility, investor confidence, regulatory compliance, and the effective allocation of proceeds towards eligible green projects (Lukács, 2025; Perez & Verbruggen, 2026).

Table 5. Functional roles of issuance and governance stakeholders

Actor	Primary role	Contribution to scheme design
Issuers (Governments, LRAs, utilities, corporations, DFIs)	• Bond issuance • Strategic coordination	• Define the eligible investment portfolio and Green Bond objectives • Structure the Green Bond and reporting framework • Raise financing and allocate proceeds to eligible projects
Underwriters and financial institutions	• Financial structuring • Market placement	• Support bond structuring, pricing, and investor placement • Advise issuers on issuance strategy and market conditions • Facilitate access to capital markets
External reviewers/ second-party opinion providers	• Independent verification • Credibility assurance	• Assess alignment with Green Bond Principles and sustainability frameworks • Review environmental credibility and reporting methodologies • Strengthen investor confidence
Legal advisors	• Regulatory compliance • Contractual structuring	• Support legal documentation and issuance procedures • Ensure compliance with financial regulations and disclosure obligations
Stock exchanges and market platforms	• Market intermediation • Transparency support	• Facilitate bond listing and market visibility • Support disclosure and sustainable finance reporting requirements

Technical experts and environmental advisors	• Project assessment • Environmental evaluation	• Assess environmental eligibility and impact indicators • Support project selection and environmental impact methodologies
Public authorities and regulators	• Regulatory oversight • Policy alignment	• Establish sustainable finance frameworks and reporting standards • Support market integrity and transparency

On the implementation side, Green Bond proceeds are channelled towards public and private actors responsible for developing, operating, or benefiting from eligible investments. Depending on the financing structure adopted, these stakeholders may participate either directly as project owners and operators or indirectly through aggregated investment programmes and intermediary financing mechanisms (Gorelick et al., 2024; Merler, 2025).

Table 6. Functional roles of investment and implementation stakeholders

Actor	Core investment role	Operational utilisation of Green Bond financing
LRAs and municipalities	• Public infrastructure development • Territorial investment coordination	• Finance sustainable public infrastructure and municipal transition programmes • Aggregate projects under long-term investment strategies
Public utilities and infrastructure operators	• Infrastructure implementation • Service provision	• Develop energy, transport, water, and environmental infrastructure projects • Operate long-term sustainable assets financed through Green Bonds
Private companies and project developers	• Project development • Capital deployment	Implement eligible green projects in sectors such as RES, mobility, or environmental services
Financial institutions and investment funds	• Capital mobilisation • Portfolio investment	• Invest in Green Bond issuances and sustainable asset portfolios • Support secondary market liquidity
Households and citizens	• Final beneficiaries • Local participation	Benefit indirectly from improved infrastructure, energy services, and environmental investments supported through Green Bond financing
Energy communities and collective entities	• Collective investment participation • Local energy development	Participate in community-scale sustainable energy and infrastructure projects financed through aggregated investment structures
Technical operators and service providers	• Project execution • Operational support	Deliver technical implementation, monitoring, maintenance, and performance verification services for financed projects

3. Setting up a Green Bond scheme: A quick step-by-step guide

Establishing a Green Bond scheme involves considerably more than issuing a conventional debt instrument labelled as "green". In practice, it requires the development of a structured governance and financing framework capable of ensuring transparency, credibility, regulatory compliance, and long-term reporting consistency throughout the lifecycle of the bond (European Commission, 2026; OECD, 2025).

The exact implementation pathway may vary depending on the institutional structure, market maturity, and financing objectives of the issuer, but in general it follows three interconnected phases:

- Pre-Issuance, focused on strategic preparation, framework development, and verification;
- Issuance, covering bond structuring, investor engagement, and market placement;
- Post-Issuance, focused on proceeds allocation, performance monitoring, impact assessment, and disclosure requirements.

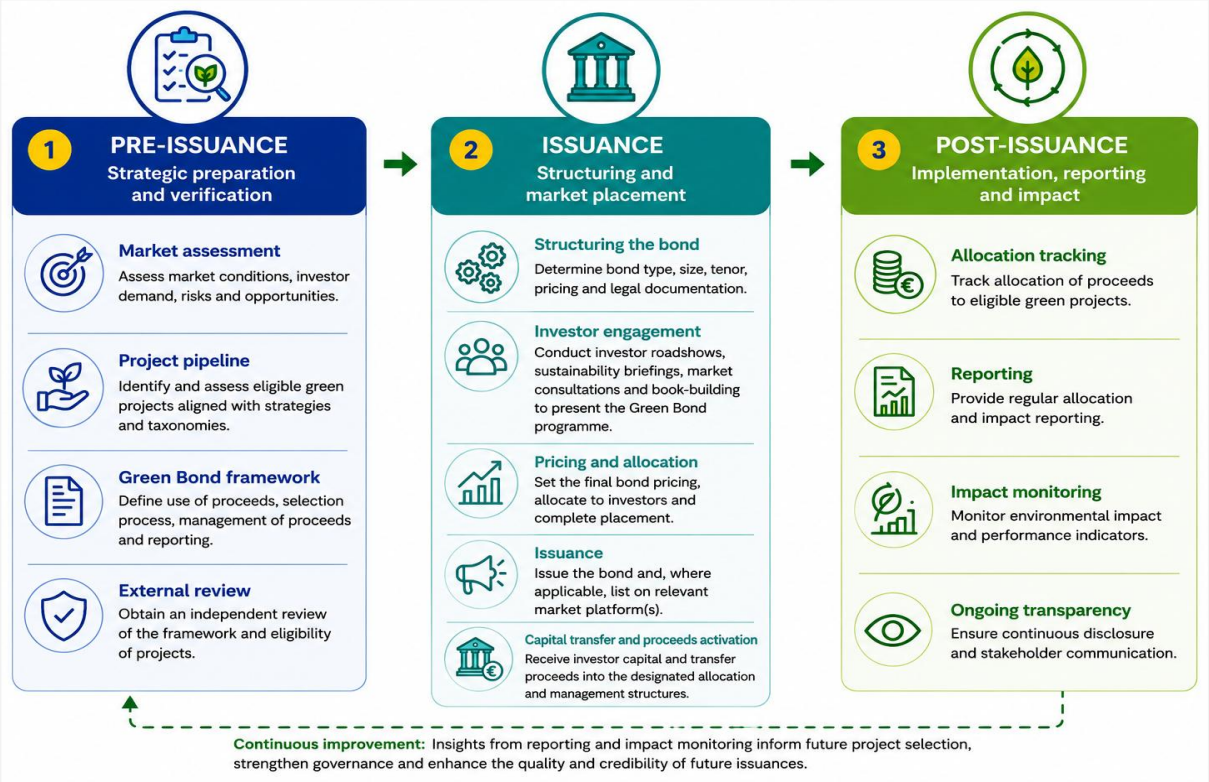

Figure 10. The Green Bond implementation lifecycle

For LRAs, the process typically combines strategic investment planning, project pipeline preparation, financial structuring, external verification, and ongoing monitoring obligations. In parallel, most issuance procedures are aligned with recognised frameworks such as the International Capital Market Association (ICMA) Green Bond Principles and, where applicable, the EU Green Bond Standard (EU GBS), which provide guidance on project eligibility, management of proceeds and reporting practices (OECD, 2025).

3.1. Main phases of Green Bond issuance and implementation

This section provides an indicative overview of the main phases and operational steps commonly involved in Green Bond issuance and implementation. While the overall process generally follows a common structure, its practical application may vary depending on the issuer's institutional capacity, financing strategy, project maturity, and market conditions. As such, the proposed roadmap should be understood as a flexible framework adaptable to different local contexts and investment priorities.

3.1.1. Phase 1: Pre-Issuance preparation

Phase 1 establishes the strategic, financial, and governance foundations of a successful Green Bond issuance. It focuses on early investment planning, institutional readiness, project eligibility assessment, and the development of the governance structures required to support a credible and market-aligned Green Bond framework. At this stage, issuers typically:

- define the strategic objectives and scope of the Green Bond programme,
- identify and assess eligible green projects and investment pipelines,
- establish governance, reporting, and proceeds management procedures,
- prepare the technical, financial, and verification conditions required for market issuance.

Step 1.1 – Strategic preparation and investment identification

This step establishes the strategic rationale, financing objectives, and preliminary investment scope of the Green Bond programme, while confirming the issuer's institutional readiness and capacity to access sustainable finance markets.

At this stage, the issuer defines the core sustainability and financing goals of the issuance, ensuring alignment with broader climate, energy, or territorial development strategies. In parallel, cross-departmental teams conduct a comprehensive preliminary evaluation of the asset portfolio, focusing on:

- financing priorities and investment scale, by mapping eligible green sectors and estimating overall financing needs and baseline investment parameters,
- pipeline maturity, by assessing individual project readiness, technical deployment schedules, and implementation timelines,
- environmental impact potential, by estimating the expected climate and sustainability benefits to ensure compatibility with SECAPs, climate-neutrality targets, or broader ESG mandates,
- institutional capacity by auditing internal financial, administrative, operational, and legal resources required to support subsequent issuance steps and long-term monitoring obligations.

Step 1.2 – Green Bond framework development and governance setup

This step transforms the initial investment concept into a structured Green Bond framework capable of supporting credible market issuance and long-term compliance obligations.

At this stage, the issuer develops the operational and governance architecture that will guide how proceeds are allocated, monitored, and reported throughout the bond lifecycle. The focus shifts from strategic planning to the establishment of practical implementation procedures, including:

- eligibility criteria, by formally defining the boundaries and technical conditions for eligible investment categories,
- proceeds management procedures, through the establishment of tracking, ring-fencing, and internal auditing protocols and procedures,
- reporting and disclosure methodologies by selecting concrete environmental indicators, impact metrics and standardising data collection and monitoring approaches,
- governance arrangements, by clarifying internal responsibilities, decision-making procedures, and coordination mechanisms across departments and external advisors.

Alongside this operational setup, particular attention is generally given to integrating recognised sustainable finance standards - most commonly the ICMA Green Bond Principles and, where relevant, the EU GBS - to establish a robust and transparent foundation for the overall issuance process, thereby strengthening market credibility and investor confidence.

Step 1.3 – External review and issuance preparation

Once the Green Bond framework is established, the issuer prepares for market engagement by validating the credibility, transparency, and compliance of the proposed issuance structure.

This step finalises the pre-issuance phase through external assessment and operational preparation for capital market placement. Activities typically focus on:

- independent verification to ensure compliance against international and European sustainability criteria, including an SPO, a certified taxonomy-alignment assessment other external procedures,
- documentation and disclosure preparation, covering regulatory documentation, investor communication materials, and sustainability-related disclosures required for issuance,
- market activation and coordination, involving engagement with underwriters, legal advisors, financial institutions, stock exchanges, and other market intermediaries supporting the issuance process.

3.1.2. Phase 2: Bond issuance and market placement

Phase 2 focuses on the formal structuring, placement, and launch of the Green Bond into capital markets. Building upon the governance and preparation activities completed during the pre-issuance phase, this stage transforms the established Green Bond framework into an operational financing instrument capable of mobilising capital from institutional and private investors.

At this stage, issuers:

- finalise the financial, legal, and market parameters of the bond,
- coordinate with underwriters and market intermediaries, and
- initiate investor engagement activities leading to the formal issuance and allocation of proceeds.

Step 2.1 – Bond structuring and documentation

This step focuses on the financial and legal structuring of the Green Bond prior to bond issuance, transforming the previously established governance and sustainability framework into a market-ready financing instrument tailored to meet regulatory and investor requirements.

At this stage, the issuer, together with underwriters, legal advisors, and financial institutions, finalises the core characteristics of the bond, including maturity, coupon structure, issuance size, repayment conditions, and listing arrangements. In parallel, the documentation required for regulatory approval, investor communication, and market placement is completed, ensuring consistency between the financial structure of the issuance and the sustainability commitments within the Green Bond framework.

The process generally requires compiling:

- legal and regulatory disclosures, including the official bond prospectus, offering circulars, and mandatory regulatory filings required by market authorities.
- investor relations materials, such as sustainability briefings and ESG-related information packages, market presentations and communication documents tailored to capital market participants,
- operational proceeds management procedures, covering the finalisation of allocation tracking mechanisms, ring-fencing arrangements, and internal control protocols,
- post-issuance reporting commitments, including the establishment of disclosure templates, reporting timelines, and impact monitoring arrangements.

Particular attention is also given to ensuring alignment between the financial characteristics of the bond and the sustainability commitments embedded within the Green Bond framework.

Step 2.2 – Issuance execution and market placement

This step focuses on the operational execution of the Green Bond transaction, including investor mobilisation, bond pricing, formal issuance, and the transfer of proceeds into the designated financing structures.

Once the issuance structure and supporting documentation are finalised, issuers and underwriters initiate the formal market placement process through targeted investor engagement and transaction activities. At this stage, the Green Bond formally enters capital markets, requiring close coordination among issuers, financial institutions, legal advisors, stock exchanges, and investors in order to complete the issuance process and secure the successful mobilisation of capital.

Depending on the scale and complexity of the issuance, the process may involve:

- investor engagement and market mobilisation, including investor roadshows, sustainability briefings, market consultations, and book-building procedures aimed at presenting the environmental rationale, financial profile, and strategic objectives of the Green Bond programme,
- pricing and allocation procedures, through which the final bond pricing, investor allocation, and formal placement of the instrument are completed based on investor demand and prevailing market conditions.
- bond issuance and listing activities, covering the formal issuance of the debt instrument and, where applicable, its admission to stock exchanges or sustainable finance market platforms,
- capital transfer and proceeds activation, involving the reception of investor capital and the transfer of proceeds into the designated allocation and management structures established under the Green Bond framework.

Beyond the successful completion of the transaction itself, this phase plays a critical role in establishing the issuer's credibility within sustainable finance markets, strengthening relationships with institutional investors, and ensuring confidence in the transparency and integrity of the overall Green Bond programme.

3.1.3. Phase 3: Post-Issuance management and reporting

Phase 3 focuses on the long-term management, monitoring, and reporting obligations associated with the Green Bond after issuance. At this stage, the emphasis shifts from capital mobilisation to ensuring that proceeds are allocated according to the established framework and the financed investments deliver the expected environmental outcomes and sustainability impacts.

This phase is particularly important for maintaining investor confidence, ensuring ongoing compliance with recognised sustainable finance standards and disclosure practices, and demonstrating the overall credibility and effectiveness of the Green Bond programme over time.

Step 3.1 – Proceeds allocation and financial management

This step focuses on the operational management and allocation of bond proceeds following issuance, ensuring that invested capital is distributed according to the governance, eligibility, and transparency requirements established within the Green Bond framework.

At this stage, issuers activate the allocation and tracking procedures established during the pre-issuance phase, ensuring that proceeds are channelled exclusively toward eligible green investments and implemented according to the approved financing structure. Beyond simple financial disbursement, this phase establishes the operational backbone required to maintain accountability, transparency, and consistency between financed activities and the environmental commitments communicated to investors.

The process generally includes:

- allocation tracking and ring-fencing, through dedicated sub-accounts, internal monitoring systems, or formal proceeds management registries designed to ensure clear traceability of allocated capital,
- financial oversight and internal controls, verifying consistency between approved project budgets, disbursement schedules, and eligible expenditure categories,
- project implementation monitoring, tracking both the physical progress and financial deployment of funded investments,
- temporary proceeds management, covering the treatment, liquidity management, and transparent reporting of unallocated funds pending full investment deployment.

Particular attention is generally given to maintaining accurate internal audit trails, ensuring continuous alignment between allocated proceeds and eligible investment categories, and preserving the credibility of the overall Green Bond programme throughout the implementation period.

Step 3.2 – Impact reporting, disclosure, and long-term monitoring

This step focuses on demonstrating the environmental performance, transparency, and long-term credibility of the Green Bond through ongoing reporting, impact assessment, and disclosure activities.

At this stage, issuers publish periodic allocation and impact reports describing how proceeds have been used and what environmental outcomes have been achieved. In practice, this step extends beyond standard financial reporting obligations, serving as a key mechanism for maintaining investor confidence, validating the environmental integrity of the issuance, and strengthening the issuer's long-term position within sustainable finance markets.

Depending on the structure and scale of the programme, reporting and monitoring activities may include:

- allocation reporting, documenting the distribution of proceeds across eligible investments, project categories, beneficiary sectors, and territorial implementation areas,
- environmental impact assessment, measuring indicators such as avoided greenhouse gas (GHG) emissions (tCO_2e[1]), energy savings (MWh[2]), RES generation or installed capacity (MW[3]), climate resilience outcomes, or other sustainability-related performance metrics,
- ongoing disclosure practices, ensuring transparent communication with investors, regulators, external reviewers and local stakeholders through dedicated reporting channels or public information platforms,
- external post-issuance assurance, involving independent reviews, audits or verification procedures assessing the accuracy of allocation data, reported impacts, and continued compliance with the established Green Bond framework.

Beyond these obligations, this step also contributes to:

- institutional learning,
- improves future issuance readiness, and
- helps LRAs strengthen long-term sustainable finance capacity for subsequent Green Bond programmes and broader climate investment strategies.

[1] Tonnes of carbon dioxide equivalent: Standard unit used to measure GHG emissions by converting different greenhouse gases into the equivalent amount of CO_2 based on their global warming potential.
[2] Megawatt-hour: Unit of energy representing one megawatt of power used or generated over one hour.
[3] Megawatt: unit of power equal to one million watts, commonly used to express electricity generation or installed energy capacity

At the same time, however, it can become one of the most resource-intensive aspects of Green Bond implementation, particularly for smaller LRAs where limited staff capacity and experience may constrain long-term reporting efforts. Common challenges may include:

- Fragmented data collection across multiple departments and project owners.
- Limited staff capacity to manage allocation and impact reporting alongside other responsibilities.
- Inconsistent monitoring methodologies and reporting procedures.
- Difficulties in maintaining reporting obligations throughout the bond lifecycle.
- The resource and administrative demands associated with external verification and assurance activities.

Focus Box 10: Managing post-issuance reporting fatigue

Addressing the operational burden associated with ongoing reporting is essential for maintaining long-term participation in the Green Bond market. While reporting requirements are critical for transparency and credibility, they can become challenging to sustain if the necessary institutional capacity, monitoring systems, and internal coordination mechanisms are not established before issuance.

Indicative market observations:

- For smaller LRAs, annual allocation and impact reporting may require approximately 0.15–0.30 full-time equivalent (FTE), depending on programme size, reporting complexity, and the maturity of internal monitoring systems.
- This corresponds to approximately 6–12 weeks of workload distributed throughout the year, assuming that basic monitoring and data collection systems are already in place.
- In many cases, reporting challenges stem less from the availability of data and more from the absence of clearly defined data flows and responsibilities between technical, financial, and sustainability departments.

Recommendations for LRAs

- Integrate Green Bond reporting into existing sustainability and climate monitoring processes (e.g. SECAP monitoring) to avoid duplicate data collection and reporting efforts.
- Use recognised reporting frameworks and templates (e.g. ICMA Harmonised Frameworks) to streamline impact assessment and disclosure practices.
- Strengthen internal monitoring systems and clearly define reporting responsibilities across departments and project owners from the outset.

Note: Capacity estimates presented above are indicative market observations intended for planning purposes only. They are based on internal benchmarking and broadly aligned with trends identified by ICMA and CBI regarding repeat-issuance patterns among municipal issuers. Actual resource requirements may vary across issuers and programmes.

3.2. What are the prerequisites for setting up a Green Bond scheme?

Although indicative in nature, the phases and operational steps presented throughout the roadmap provide a useful foundation for LRAs to better understand, organise, and structure the overall implementation pathway for a Green Bond strategy. At the same time, the feasibility and configuration of a Green Bond issuance are strongly influenced by a number of factors linked to the issuer's legal authority, financial profile, market positioning, and access to financing intermediaries or affiliated entities (Padraig, 2016).

While some LRAs already operate within mature governance environments well-suited for direct capital market access, others face different operational realities and levels of market readiness, requiring alternative issuance structures, partnership models, or credit enhancement approaches. To help navigate existing variations, Figure 11 provides a decision-support framework guiding LRAs through the most viable Green Bond development pathways according to their specific financial and administrative context.

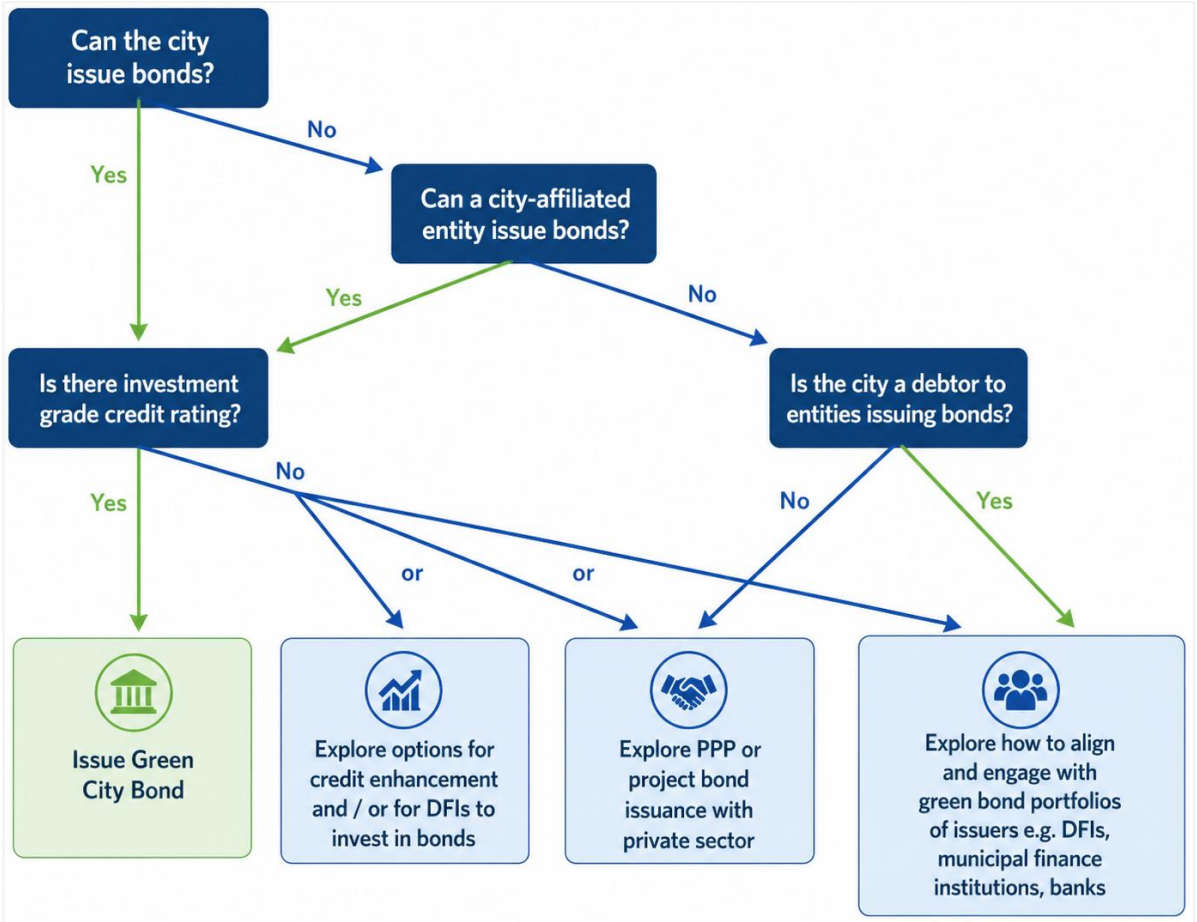

Figure 11. Indicative decision-support framework for Green Bond development pathways

To complement this strategic assessment, the following checklist provides a concise set of guiding questions for LRAs throughout the Green Bond setup and issuance process, helping convert planning considerations into practical implementation actions

Phase 1: Pre-Issuance / Step 1.1 – Strategic preparation and investment identification

☐ Are the financing objectives and strategic priorities of the issuance clearly defined?

☐ Is there a mature pipeline of eligible green projects aligned with local climate and sustainability strategies?

☐ Have financing needs, expected impacts, and institutional readiness been preliminarily assessed?

Phase 1: Pre-Issuance / Step 1.2 – Green Bond framework development and governance setup

☐ Have eligibility criteria, proceeds management procedures, and reporting methodologies been established?

☐ Are governance responsibilities, allocation tracking mechanisms, and internal controls clearly defined?

☐ Is the framework aligned with recognised international or EU standards?

Phase 1: Pre-Issuance / Step 1.3 – External review and issuance preparation

☐ Has an external review or SPO been planned or obtained?

☐ Are the required legal, regulatory, and investor disclosure documents prepared?

☐ Have key external actors, including underwriters, advisors, and financial institutions, been engaged?

Phase 2: Issuance / Step 2.1 – Bond structuring and documentation

☐ Has the final bond structure (size, maturity, coupon, repayment terms) been defined??

☐ Are the issuance documents and investor communication materials finalised?

☐ Are proceeds management and post-issuance reporting arrangements operationally ready?

Phase 2: Issuance / Step 2.2 – Issuance execution and market placement

☐ Have investor engagement and market placement activities been properly coordinated?

☐ Are pricing, allocation, and listing procedures clearly established?

☐ Are proceeds transfer and activation mechanisms ready for implementation following issuance?

Phase 3: Post- Issuance / Step 3.1 – Proceeds allocation and financial management

☐ Are procedures in place to track and manage the allocation of proceeds?

☐ Is project implementation and financial deployment being systematically monitored?

☐ Are internal controls and audit trails sufficient to ensure transparency and accountability?

Phase 3: Post- Issuance / Step 3.2 – Impact reporting, disclosure, and long-term monitoring

☐ Have allocation and impact reporting timelines and indicators been clearly defined?

☐ Are ongoing disclosure and stakeholder communication mechanisms operational?

☐ Can the municipality maintain long-term monitoring, reporting, and future issuance readiness?

3.3. Indicative timelines and planning considerations

Green Bond issuance is rarely a short-term financing solution, with timelines varying depending on the size of the investment programme, institutional capacity, regulatory requirements, and market conditions. This requires LRAs to generally allow for a substantial preparation period before accessing capital markets.

For first-time issuers, the process typically requires between 12 and 18 months from the initial political decision to bond issuance. A significant share of this period is often dedicated to establishing the Green Bond Framework, identifying and screening eligible projects, procuring external reviews such as a SPO, and preparing the necessary legal and financial documentation.

By contrast, repeat issuers can often build on existing governance structures, reporting systems, and investor relationships, reducing preparation times considerably.

For both cases, Table 7 provides an indicative overview of typical preparation timelines.

Table 7. Indicative timelines for first-time and repeat Green Bond issuers

Activity	First-time issuer	Repeat issuer
Project identification and pipeline development	2–4 months	1–2 months
Green Bond Framework development	2–3 months	1 month
External review / SPO procurement	2–3 months	1–2 months
Legal and financial structuring	2–4 months	1–2 months
Investor engagement and issuance	1–2 months	1 month
Indicative total duration	**12–18 months**	**4-8 months**

For LRAs, these timelines should be carefully aligned with budget cycles, investment planning processes, and political mandates. This is particularly important given that a Green Bond programme may begin under a favourable political window, while the actual issuance and implementation take place under a different one. Early planning, institutional commitment, and cross-departmental coordination are therefore essential to ensure continuity throughout the preparation and implementation process, even where political or budgetary priorities evolve over time.

4. Case studies

This section presents two illustrative case studies showcasing different stages of Green Bond market development. Together, they highlight how Green Bond programmes evolve over time, from pioneering first-time issuers that establish governance structures and reporting frameworks from scratch to mature issuers that build on established market experience, institutional capacity, and investor confidence.

4.1. The pioneer - City of Gothenburg (Sweden)

GENERAL CONTEXT. The City of Gothenburg is widely recognised as the world's first municipal Green Bond issuer, launching its inaugural Green Bond in 2013. The initiative was developed to support the city's environmental and climate objectives while creating a transparent mechanism for financing sustainable investments. Since then, Gothenburg has become one of Europe's most established municipal Green Bond issuers, regularly updating its framework and reporting practices.

HOW GREEN BONDS WERE APPLIED. Gothenburg developed a dedicated Green Bond Framework defining eligible project categories, project selection procedures, governance arrangements, and reporting requirements. Bond proceeds were allocated to a range of environmental projects, including sustainable transport, renewable energy, energy-efficient buildings, water management, and climate adaptation measures. The city also established comprehensive allocation and impact reporting practices, contributing to the development of international Green Bond market standards.

Figure 12. Evolution of Gothenburg's Green Bond programme from inaugural issuance to long-term market participation

KEY TAKEAWAY. The Gothenburg experience demonstrates the importance of investing early in governance structures, project selection procedures, and reporting systems. While these requirements can increase preparation time for first-time issuers, they create the institutional foundations necessary for repeated issuances and long-term participation in the Green Bond market.

READ MORE ABOUT THIS PRACTICE. Further information on Gothenburg's Green Bond programme can be found through the UNFCCC Momentum for Change initiative and the City of Gothenburg's Green Bond reporting publications.

4.2. The Mature issuer - Île-de-France Mobilités (France)

GENERAL CONTEXT. Île-de-France Mobilités is the public transport authority serving the Paris metropolitan region and one of Europe's most active sustainable finance issuers. In 2026, the organisation became the first public-sector issuer under the EU GBS, raising €1 billion to support the modernisation and decarbonisation of the region's transport network.

HOW GREEN BONDS WERE APPLIED. The Green Bond issuance was structured under the newly introduced European Green Bond (EuGB) framework and financed investments aimed at expanding and modernising sustainable public transport infrastructure. The transaction attracted strong investor interest, with demand exceeding €7.6 billion.

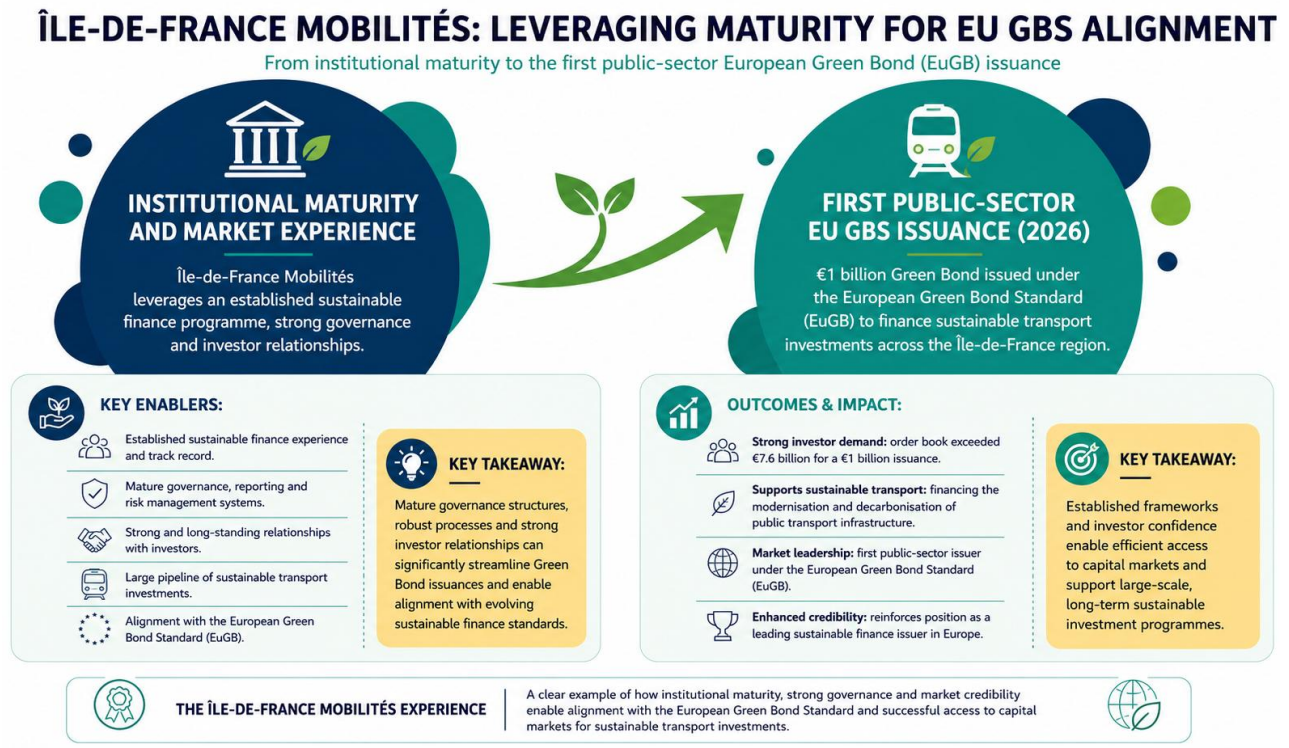

Figure 13. The Île-de-France Mobilités Green Bond experience

Building on its previous sustainable finance experience and established governance structures, Île-de-France Mobilités was able to efficiently access capital markets while demonstrating alignment with the latest European sustainable finance standards.

KEY TAKEAWAY. The Île-de-France Mobilités case illustrates how established issuers can leverage existing governance frameworks, reporting systems, and investor relationships to streamline Green Bond issuance processes and attract significant market demand. It also demonstrates the growing role of EU GBS in shaping future sustainable finance practices.

READ MORE ABOUT THIS PRACTICE. Further information is available through Île-de-France Mobilités' Investor Relations portal, including the official European Green Bond Factsheet and the corresponding press release publication.

The PROSPECT inventory of successful stories offers LRAs a practical and peer-validated reference framework for moving from strategic planning to operational financing deployment.

Focus Box 11: Is your investment pipeline large enough for a Green Bond?

Green Bond issuance involves fixed transaction costs that are largely independent of project size, and may include framework development, legal and financial advisory services, external reviews (SPOs), underwriting fees, reporting systems, and ongoing monitoring and disclosure requirements. For this reason, Green Bonds are generally more suitable for sizeable investment programmes rather than a small number of individual projects.

While there is no universally applicable minimum issuance size, indicative market experience suggests that Green Bond issuances below approximately €20–30 million may face challenges in achieving cost-efficiency, particularly for first-time issuers. By contrast, larger programmes can spread transaction and reporting costs across a broader investment portfolio, improving overall efficiency and market attractiveness.

As a rule of thumb, LRAs should ensure they have a sufficiently large and mature pipeline of eligible projects before considering Green Bond issuance. Where individual projects are too small, pooled or aggregated arrangements may offer a more proportionate solution. For smaller LRAs, Green Bonds are often most effective when financing a portfolio of projects, allowing transaction costs to be spread across a larger investment volume.

Note: The indicative issuance size presented above reflects general market practice and should not be interpreted as a formal threshold. Actual feasibility depends on factors such as market conditions, project characteristics, issuance structure, and the issuer's institutional capacity.

5. Critical conditions influencing Green Bond schemes

The successful development of a Green Bond scheme requires balancing capital mobilization with rigorous environmental governance. Unlike conventional municipal borrowing, Green Bonds operate at the intersection of financial creditworthiness and sustainability-related compliance. To secure long-term market credibility and investor confidence, LRAs must ensure the environmental integrity, traceability, and transparent reporting of funded projects throughout the lifecycle of the issuance (Baldi & Ferri, 2022; García-Escobar et al., 2026; OECD, 2025).

Consequently, the scalability of these schemes depends on a unique combination of structural drivers, market constraints, and operational risks outlined below.

5.1. Drivers and success factors

The long-term viability of an LRA's Green Bond strategy depends on specific enabling conditions that support capital market readiness, investor confidence, and institutional transparency. Key drivers and success factors include:

- Strong alignment with local climate, energy, and sustainability priorities, ensuring long-term political commitment and strategic integration within broader municipal investment planning.
- Availability of mature, investment-ready green project pipelines, capable of generating measurable environmental outcomes and supporting large-scale capital mobilisation.
- Transparent governance arrangements and robust proceeds management structures, enabling effective allocation tracking, reporting, and accountability throughout the issuance lifecycle.
- Alignment with recognised sustainable finance frameworks and market practices, particularly the ICMA Green Bond Principles and, where relevant, the EU GBS.
- Reliable environmental data, monitoring systems, and disclosure methodologies, supporting credible impact assessment and long-term investor transparency.
- Strong cooperation with financial institutions, underwriters, advisors, stock exchanges, and external reviewers, facilitating issuance preparation, market placement, and investor engagement.
- Access to complementary financing instruments and credit enhancement mechanisms, helping improve market attractiveness and reduce financing risks.
- Long-term institutional capacity for ongoing reporting, monitoring, disclosure, and investor communication obligations extending beyond the issuance phase.

5.2. Barriers and limitations

Despite the expansion of sustainable finance, LRAs often encounter structural, regulatory, and capacity-related bottlenecks. Key barriers and limitations include:

- Restrictive borrowing authority, resulting from regulatory frameworks or constitutional limitations constraining local or sub-national entities from issuing debt instruments directly.
- Sub-optimal credit profiles, reflecting insufficient financial capacity or weak standalone creditworthiness that may discourage institutional investor participation[4].
- Fragmentation of investment assets, limiting the ability to aggregate smaller local projects into investment portfolios capable of meeting viable bond market thresholds.
- High transaction and fixed issuance costs, including expenses related to legal structuring, framework development, external reviews, second-party opinions, and ongoing verification procedures.
- Administrative and compliance complexity, associated with demanding reporting obligations, EU Taxonomy screening criteria, disclosure requirements, and long-term impact tracking.
- Limited internal expertise and technical capacity, particularly regarding capital market operations, sustainable finance governance, reporting methodologies, and investor relations.
- Dependence on external intermediaries and advisors, increasing coordination complexity and operational reliance on financial institutions or development actors.
- Long-term reporting fatigue and monitoring challenges, affecting the consistency and standardisation of environmental reporting across extended implementation periods.
- Exposure to greenwashing and reputational concerns, particularly where project delivery delays or weak environmental performance undermine publicised sustainability commitments.

5.3. Key risk dimensions

Green Bonds introduce specialised governance, operational, financial, and reputational risks that must be continuously monitored throughout the lifecycle of the issuance. Key risk dimensions include:

- Credit and debt servicing risk, arising from long-term fiscal instability or structural budgetary pressures affecting the issuer's ability to meet repayment obligations.
- Refinancing and interest rate risk, resulting from macro-financial fluctuations affecting borrowing costs and future refinancing conditions.

[4] In general investment-grade ratings - commonly classified from BBB-/Baa to AAA by major credit rating agencies - generally indicate stronger financial reliability and lower perceived default risk (Padraig, 2016).

- Market execution and placement risk, emerging when issuance timing, pricing conditions, or transaction structures fail to align with investor expectations and market demand.
- Operational and proceeds management risk, linked to fragmented internal coordination, weak tracking systems, or failures in the allocation and ring-fencing of proceeds.
- Project delivery and capital deployment risk, associated with implementation delays, procurement bottlenecks, or underperforming project pipelines leaving proceeds partially unallocated.
- Disclosure and data accuracy risk, resulting from inconsistent environmental methodologies, inaccurate impact metrics, or insufficiently verified reporting practices.
- Regulatory and taxonomy-alignment risk, linked to evolving sustainable finance regulations, EU GBS requirements, or changing technical screening criteria affecting framework eligibility.
- Greenwashing and reputational risk, emerging when sustainability claims cannot be adequately verified or supported through credible reporting and impact assessment practices.
- Market access and investor confidence risk, potentially limiting the issuer's ability to scale future Green Bond programmes or broader sustainable finance initiatives.

Focus Box 12: Contextual influences on strategy configuration

The structure and feasibility of a Green Bond strategy are shaped not only by the technical design of the instrument itself, but also by the broader contextual conditions influencing issuer's readiness and capital market integration. For LRAs in particular, these may include:

- legal and regulatory capacity, largely determined by the legislative frameworks governing municipal borrowing limits, debt management rules, and direct access to capital markets,
- investment scale and risk profile, reflecting the size, maturity, and risk characteristics of the planned infrastructure portfolio, which collectively dictate investor appetite and the issuance attractiveness,
- financial strength and creditworthiness, shaped by the repayment capacity and overall stability of the LRA's balance sheet, affecting investor confidence, bond pricing, and borrowing conditions,
- access to capital market actors and intermediaries, influenced by the availability of partnerships or affiliated entities that may support or facilitate market participation, including:
    - municipally affiliated entities, utilities, or public agencies,
    - public-private partnerships (PPPs),
    - commercial banks or private sector companies with capital market access,
    - national promotional institutions and development banks,
    - multilateral or bilateral financial institutions and development agencies.

Together, these conditions influence the overall complexity, scalability, and financing structure of Green Bond schemes, often determining whether LRAs pursue direct issuance, pooled structures, intermediary-supported arrangements, or blended financing approaches.

5.4. Synthesis of critical conditions affecting implementation

Table 8 provides a consolidated overview of the main conditions influencing the design and implementation of Green Bond schemes, highlighting key enabling factors, common barriers and risks, and indicative mitigation approaches supporting effective deployment and long-term market credibility.

Table 8. Summary of critical conditions influencing Green Bond schemes

Dimension	Key drivers/enabling factors	Common barriers/risks	Mitigation measures
Regulatory and institutional framework	• Clear municipal borrowing authority/mandate • Alignment with national and EU frameworks	• Restrictive borrowing rules • Regulatory uncertainty • Evolving taxonomy requirements	• Early legal assessment • Alignment with recognised standards • Cooperation with national authorities and advisors
Creditworthiness and financial capacity	• Stable fiscal position and revenue streams • Transparent financial management • Strong and reliable repayment capacity	• Weak standalone creditworthiness • High borrowing costs • Limited investor confidence	• Credit enhancement mechanisms • Pooled issuance structures • DFI support, guarantees
Project pipeline and investment scale	• Mature green project pipeline • Sufficient investment scale • Clear environmental and social impact profiles	• Fragmented assets • Insufficient project scale • Weak pipeline maturity	• Project aggregation • Phased investment planning, • Pipeline development support
Governance and proceeds management	• Transparent allocation procedures • Clear internal governance structures and cross-departmental coordination mechanisms	• Weak internal coordination • Inadequate tracking systems • Insufficient accountability mechanisms	• Ring-fencing protocols • Dedicated management structures • Internal auditing procedures
Environmental monitoring and reporting	• Pre-defined key performance indicators (KPIs) • Reliable monitoring systems • Transparent reporting	• Inconsistent reporting • Weak data quality • Disclosure failures • Greenwashing concerns	• Standardised reporting methodologies • External verification, continuous monitoring frameworks
Market access and investor engagement	• Strong market partnerships • Credible investor communication • Targeted finance outreach	• Limited investor appetite • Weak market visibility • Failed placement or pricing difficulties	• Early investor engagement • SPOs/external reviews • Strategic market communication
Administrative and technical capacity	• Internal expertise/access to internal technical support • Standardised impact assessment tools	• Limited institutional capacity, • Over-reliance on intermediaries • Reporting fatigue	• Capacity building • External technical assistance • Long-term administrative planning
Implementation and long-term credibility	• Efficient project delivery/ Reliable timelines • Long-term political consensus/commitment	• Project execution delays • Underperforming investments • Reputational risks • Declining investor confidence	• Ongoing transparency • Post-issuance verification • Adaptive governance and monitoring systems

6. Summary of key takeaways

WHAT ARE GREEN BONDS ABOUT? Green Bonds are debt instruments designed to raise capital exclusively for projects generating positive environmental and climate impacts. Unlike conventional borrowing or grant-based funding, they connect local territorial priorities directly with institutional capital markets, helping LRAs mobilise long-term financing for sustainable infrastructure while diversifying funding sources and strengthening investor confidence.

In doing so, Green Bonds represent more than a simple financing mechanism. They can support LRAs in structuring investment-ready climate programmes, strengthening sustainability governance and transparency practices, and embedding long-term environmental objectives into public financial planning and infrastructure development strategies.

HOW ARE GREEN BONDS STRUCTURED IN PRACTICE? In practice, Green Bond schemes follow a structured operational sequence moving through three core phases - from framework development and project preparation to financial structuring, market issuance, and post-issuance monitoring and disclosure. Throughout the bond lifecycle, issuers are expected to maintain continuous transparency through regular reporting on both proceed allocation and the environmental impacts generated by the investments.

Beyond the standard standalone process, six main structural arrangements are recognised to accommodate varying local capacities and asset scales:

- Sovereign issuance arrangements, where national governments issue and redistribute Green Bonds.
- Municipal or regional issuance arrangements, where LRAs directly access capital markets.
- Development bank-supported arrangements, involving DFI-backed guarantees, mechanisms, or technical assistance support.
- Aggregated or pooled issuance arrangements, where multiple LRAs combine projects to achieve sufficient market scale.
- Corporate or utility-led arrangements, involving MOEs, utilities or private infrastructure partners.
- SPV-based arrangements, where dedicated entities issue bonds backed by ring-fenced assets or revenues.

Depending on the selected issuance structure, LRAs may act either as direct issuers accessing capital markets themselves or as beneficiaries receiving financing through intermediary-supported arrangements. In all cases, moving from concept to market launch requires them to carefully weigh their legal boundaries, creditworthiness, and project pipeline maturity.

WHAT ARE THE MAIN GREEN BOND TYPES AND HOW ARE THEY APPLIED ACROSS SECTORS? Green Bond types vary based on how repayment obligations are structured and how financing is secured against specific underlying assets or cash flows. Rather than acting as rigid, isolated structures, these diverse bond typologies provide LRAs with the flexible financial mechanisms needed to balance risk allocation, investment scale, and governance complexity across different territorial assets.

Table 9. Summary of the main Green Bond types and their application across contexts

Typology	Green Bond type	Core idea	Typical use for LRAs
Standard use-of-proceeds	Standard green use-of-proceeds bonds	Proceeds earmarked for green projects; backed by issuer's full balance sheet and credit.	• Municipal investment programmes • Public infrastructure projects • Corporate sustainability financing
Revenue-linked	Green revenue bonds	Repayment backed by specific revenues of the financed asset rather than the general balance sheet.	• Transport infrastructure • Water utilities • Energy networks • User-fee-based infrastructure
Project-specific	Green project bonds	Debt tied to a single project and is repaid strictly via project-level cash flows and performance.	• RES projects • Infrastructure investments • Large-scale sustainable developments
Asset-backed/ Securitised	Green securitised bonds	Bonds backed by aggregated (pooled) portfolios of green assets, loans, or receivables.	• EE loan portfolios • Green mortgages • Distributed RES programmes
National expenditures	Sovereign green bonds	Issued by national governments to fund public climate expenditures and national strategies.	• National climate investment plans • Public infrastructure programmes • Energy transition strategies
Transition pathways	Climate transition bonds	Financing dedicated to emission reduction pathways in hard-to-abate operations.	• Industrial decarbonisation • Hard-to-abate sectors • Long-term transition strategies
Performance-targeted	SLBs	Bond characteristics linked to meeting key performance targets, not to earmarked projects.	• Corporate sustainability strategies • ESG performance programmes • Transition-oriented financing frameworks

Rather than functioning as isolated financing instruments, Green Bond typologies can be strategically combined within broader financing architectures, allowing LRAs to tailor capital structures to different project lifecycles, revenue profiles, and territorial investment priorities.

WHO SHOULD USE GREEN BONDS? Green Bonds are particularly relevant for LRAs and public entities seeking to:

- finance large-scale sustainable infrastructure and climate investments,
- diversify funding sources and expand access to institutional capital,
- strengthen transparency and sustainability reporting practices,
- support long-term climate neutrality and resilience objectives,
- develop mature green project pipelines aligned with strategic priorities, and
- improve investment readiness and market visibility.

They are especially suitable in contexts where significant investment needs exist and where LRAs possess, or can progressively develop, the governance, financial, and reporting capacity required to access sustainable finance markets effectively.

WHEN ARE GREEN BONDS MOST EFFECTIVE? Green Bonds are most effective when:

- mature and investment-ready green project pipelines are available,
- governance and reporting structures are sufficiently robust,
- environmental impacts can be clearly measured and monitored,
- financing needs require long-term capital mobilisation,
- institutional capacity supports continuous disclosure and investor engagement,
- market conditions enable access to sustainable finance investors, and
- financing structures are aligned with broader climate and sustainability strategies.

Under these conditions, Green Bonds can function not only as financing instruments, but also as strategic governance and investment planning tools supporting long-term territorial decarbonisation and sustainable development objectives.

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