Financial Aggregation Blueprints for Urban Climate Infrastructure - Annex 2: Municipal Green Bonds Blueprints

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CITIES CLIMATE FINANCE LEADERSHIP ALLIANCE

CLIMATE POLICY INITIATIVE

MEXICO CITY'S GREEN BOND

1. CONTEXT

Mexico City is one of the world's largest megacities, with a population that will exceed 23 million people in 2030. The city faces extensive challenges related to urban sprawl, including traffic congestion, limited access to public transportation, air pollution, water stress, and inadequate housing. Mexico City's Climate Action Plan (MCCAP) for 2014–2020 outlined key strategies and actions that the city will undertake to improve the quality of life for citizens, reduce carbon emissions and promote sustainable development. These include delivering an energy transition, containing urban sprawl, providing clean urban mobility, modernizing the water distribution system, and reducing disaster risk. Mexico City needed to raise funds to finance its plan.

2. CONCEPT

As part of its strategy to finance its Climate Action Plan, Mexico City issued an MXN 1 billion (USD 50 million) municipal green bond in 2016, becoming the first city in Latin America to issue a green bond. The green bond was designed to finance infrastructure in three major strategic priorities – sustainable transport, water and wastewater management, and energy efficiency.

For transport, investments included bus rapid transit to substitute high-emission microbuses for low-emission buses, light rail, and betterment of the Mexico City Metro. Investment in the water sector focused on the modernization of the City's water distribution network (an aging network of 12,000 km of pipes plagued by leakages leading to 41% of the City's water being lost), including the construction, replacement, and maintenance of water collection and drainage facilities, construction of water treatment plants, stormwater pumps, and reservoirs, and replacement and repair of water distribution lines (Sustainalytics, 2016). Investment in energy efficiency focused on installing and maintaining LED streetlights and lights in municipal buildings.

As the first city in Latin America to issue a green bond, Mexico City has established itself as a leader in green financing. The success of the green bond led to the issuance of a joint green and sustainability bond 7 for MXN 2.1 billion in 2017 (USD 100 million).

3. INSTRUMENT MECHANICS

The issuance of the Mexico City green bond followed four stages:

Stage 1: Scoping

- **Scoping with bond experts**: Mexico City's Environment Department (ED) held a series of meetings with the Climate Bonds Initiative[1], which suggested the development of a green bond and explained the critical steps o the issuance.

1 Climate Bonds Initiative is an international organisation working to mobilise global capital for climate action. CBI has developed the Climate

- **Capacity-building**: The ED presented the concept to the Administration and Finance Department (AFD) and launched a capacity-building program for local officials on green finance for mitigation and adaptation to understand the projects eligible for green bond financing.

Stage 2: Development of the green bond framework:

- **Green bond framework design**: Following the Green Bond Principles[2] and priorities stated in the climate action plan, the ED developed the framework outlining (a) the use of proceeds, (b) the process for project evaluation and selection, (c) the financial management of proceeds, and (d) the reporting on the use of proceeds. Additionally, AFD analyzed each to ensure their financial viability.
- **Presentation to the Federal Government**: AFD presented the framework to the federal government's Department of Inland Revenue to seek a financial guarantee – a step needed as Mexican cities are not legally allowed to go into debt and therefore require a federal government guarantee[3] to borrow from capital markets. The Federal government agreed to guarantee the green bond.
- **Second opinion**: Mexico City hired the sustainability ratings agency Sustainalytics to provide a 'second opinion' for the green bond, which stated that the green bond was 'robust, credible and transparent.'

Stage 3: Launch of the green bond

- **Financial broker hire**: Mexico City hired HSBC to take the bond to market. HSBC was responsible for promoting the bond with the private sector and negotiating its sale. HSBC set the bond terms (annual interest rate of 6.02% and tenor of 5 years) based on its understanding of the City's needs and prevailing market conditions.
- **Bond sale**: The sale was made through the Mexican Stock Exchange, and HSBC deposits were made directly with the Mexico City AFD.

Stage 4: Infrastructure financing, reporting, and repayment

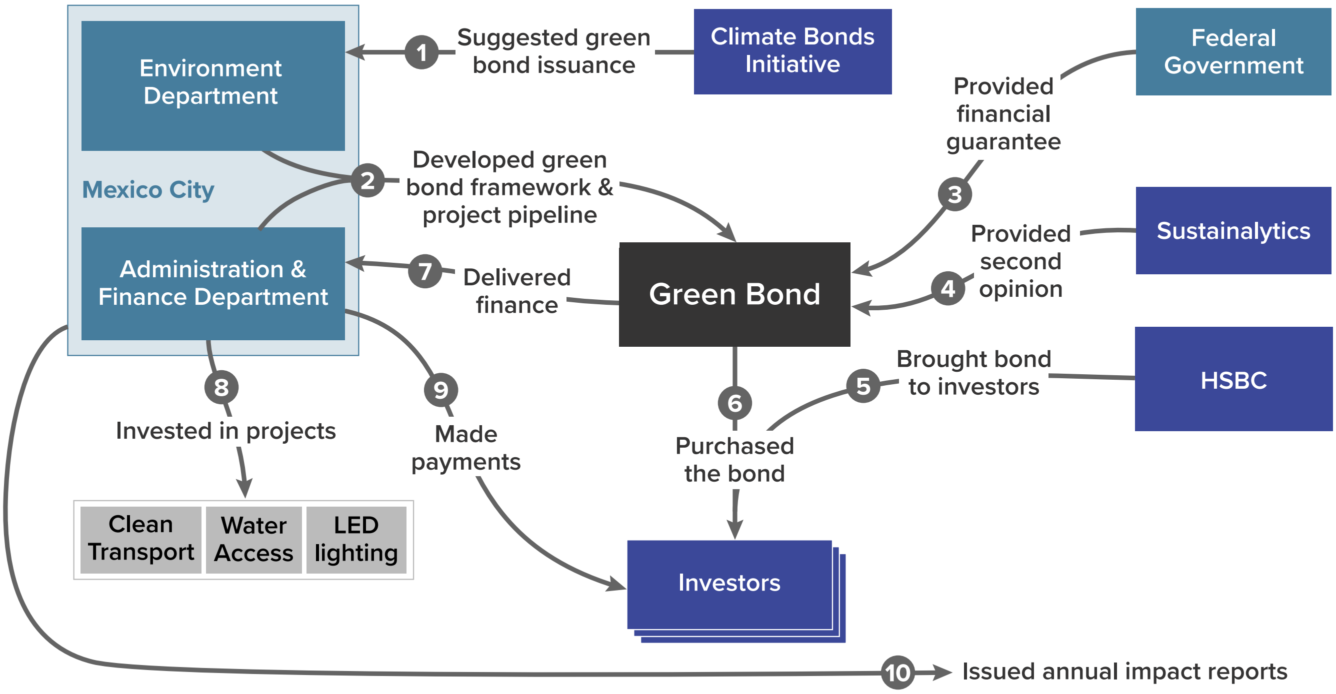
- **Financing**: Mexico City used the finance to make priority investments in clean transport, water distribution, and energy-efficient LED lighting.
- **Reporting**: Mexico City's ED publishes a Green Bond Report annually on its website outlining the green projects that have been financed using proceeds from the green bond and impact measurements for each project.
- **Repayment**: Annual interests are paid by Mexico City's AFD using tax revenues collected by the city, and once the bond reaches maturity, it will repay the principal to investors.

Bonds Standard, used by governments, companies and investors around the world. See more at https://www.climatebonds.net

2 Voluntary best practice guidelines established in 2014 by a consortium of investment banks monitored and developed by an independent secretariat hosted by the International Capital Market Association (ICMA).

3 The financial guarantee provided assurance to investors that if Mexico City defaulted on its debt obligations, the federal government would step in and cover payments to investors.

Figure 1: Mexico City green bond financial mechanism



4. IMPACT

The Mexico City green bond raised MXN 1 billion (USD 50 million), becoming oversubscribed by 2.5 times, highlighting the strong demand for Mexico City's green bond from investors. In 2018, the city hired Carbon Trust to undertake an impact assessment of the projects financed with the bond:

- **GHG emissions**: Annual reduction of 45,364 tCO2e through mobility projects and avoidance of 3,823 tCO2e with investments in LED lights - 7,352 MWh of annual energy savings.
- **Water access:** 656,730 people benefited from upgrading the City's municipal water distribution network.

Based on the success of the first green bond issuance, Mexico City launched a joint green and sustainability bond for MXN 2.1 billion (USD 100 million) in 2017.

5. KEY TAKEAWAYS

This section summarises key takeaways based on the blueprint analysis and is divided into "Challenges" and "Success factors."

5.1 CHALLENGES:

- **Lack of municipal borrowing authority.** Despite its high credit rating, Mexico City cannot legally borrow and requested national government financial guarantees to issue its green bond.

- **Technical expertise is needed to develop the green bond framework.** Developing the green bond framework required Mexico City to build its local capacity and knowledge of green finance and strengthen its collaboration between different municipal departments and the national government.
- **Market acceptance.** Issuing the first green bond in the region involved overcoming risks associated with the market's interest in buying the bond. Following the Green Bond Principles, the federal government guarantee and the partnership with the HSBC Mexico branch helped mitigate this risk.

5.2 SUCCESS FACTORS:

- **Favorable enabling environment conditions, such as high credit score, bond issuance track record, and climate action plan in place.** Mexico City already held a AAA credit score based on its experience issuing USD 200 million worth of municipal debt each year. Additionally, the existence of its climate action plan made it easier to develop a consistent green bond framework aligned with the city's climate ambition.
- **Local capacity development.** Dialogues with CBI were crucial for the ED to understand the benefits of using green bonds to finance its climate action plan. Additionally, the training provided to the AFD on green finance for mitigation and adaptation to climate change helped them understand the projects that could fit under the bond.
- **Partnerships with financial service agencies embedded in the local market.** Cities require a financial ratings agency to issue a second opinion and a financial broker to take the bond to market. Mexico City found that partnering with local financial institutions (i.e., HSBC Mexico branch) who understand the policy, institutional and financial environment provided assurances that the design of the green bond was contextually relevant, reducing the upfront cost of the bond issuance. In 2017 when the city issued the sustainability bond, a local rating agency was also selected.
- **City leadership, partnership across municipal departments and with the national government.** City commitment and ambition to fighting climate change using a financial instrument never applied before in the region was fundamental and would not have been possible without good collaboration between different secretaries involved (i.e., ED and AFD). Partnership with the national government was also a deal breaker as it had to provide financial guarantees to the bond, as municipal borrowing is not allowed in Mexico.
- **Development of the green bond framework following international best practices.** For instance, Green Bond Principles were integrated, and a third party was hired to issue a "second opinion" on the framework.

FURTHER READING:

1. Carbon Trust (2018). Seguimiento y evaluación de la emission del bono verde 2016 de la CDMX – Segundo Año. Available at http://procesos.finanzas.cdmx.gob.mx/bono_verde/docs/reportes/Seguimiento_y_Evaluacion_de_la_Emision_del_Bono_Verde_2016_de_la_CDMX_Segundo_Año.pdf

2. Ciudad de México (2014). Mexico City's Climate Action Plan 2014-2020. Available at https://www.gob.mx/cms/uploads/attachment/file/164914/PACCM-2014-2020completo.pdf
3. Environmental Finance (2017). Bond of the year: Municipal – Mexico City. Available at https://www.environmental-finance.com/content/awards/green-bond-awards-2017/winners/bond-of-the-year-municipal-mexico-city.html
4. Rojas, D. (2018). Mexico City places bets on green bonds. Reuters. Available at https://www.reutersevents.com/sustainability/mexico-city-places-bets-green-bonds
5. Sustainalytics (2016). Ciudad de México Green Bond Framework: Second Opinion. Available at https://mstar-sustops-cdn-mainwebsite-s3.s3.amazonaws.com/docs/default-source/spos/green_bond_opinion_cdmx_11112016_final.pdf?sfvrsn=b157bf20_3
6. Swope, C. (2017). Lessons learned from Mexico City's first green bond. Greenbiz. Available at https://www.greenbiz.com/article/lessons-learned-mexico-citys-first-green-bond

REYKJAVÍK'S GREEN BOND

1. CONTEXT

The City of Reykjavík in Iceland has a population of approximately 135,000 (or 36% of Iceland's population), making the city's climate action a fundamental pillar for the country to deliver its NDCs. Reykjavík has developed an ambitious climate action plan to achieve carbon neutrality before 2040 by targeting infrastructure interventions in various sectors, including transportation, energy, green buildings, and waste management. The city needed to fundraise to deploy its climate action plan.

2. CONCEPT

The City of Reykjavík issued a municipal green bond in December 2018 for ISK 4.1 billion (USD 33 million), positioning itself as a leader in European municipal green debt issuance. The green bond was both the first municipal green bond in the country and the first green bond issued in ISK and listed on the Nasdaq Reykjavík stock exchange.[4] Hence, Reykjavík helped pave the way for Iceland's green bond market.

The city used proceeds from the bond to make green infrastructure investments in line with its climate action plan. More specifically, finance has been used to date to make investments in clean transportation, waste-to-energy through a municipal biogas plant, green buildings, and energy efficiency projects.

3. INSTRUMENT MECHANICS

The issuance of the Reykjavík green bond followed four stages:

Stage 1: Development of the green bond framework

- **Consultant hiring**: Reykjavík hired an independent consultant who had worked on green bonds in Europe to lead the development of its green bond framework.
- **Consultations with Reykjavík administrations**: The consultant organized a series of meetings with the city to understand their financial systems, capital investment needs, climate change strategy, and the green projects it planned to deliver.
- **Creation of a working group with the city's departments**: Following the consultations, a working group was established to align information across departments and feed the consultant with information relevant to the development of the framework – members included representatives from the Treasury and the Environment and Planning Department.

4 Prior to 2018, not a single green bond had been issued by a bank, company, municipality, or the national government in Iceland. A green bond was issued by Landsvirkjun (Iceland's National Power Company) 9 months prior to the launch of the Reykjavík green bond. However, this green bond was issued in the United States and open only to US investors.

- **Benchmarking of international best practices**: The consultant examined frameworks from other countries (e.g., Nordic) and the Green Bond Principles and submitted the analysis to the working group and city council for comments.
- **Second opinion**: Reykjavík contracted the external service provider CICERO Shades of Green for a "second opinion" for the framework, which gave it the highest score ("dark green" rating and an "Excellent' governance score").
- **Approval by the city council**: The Chief Financial Officer of Reykjavík sent the final framework for approval before the city council.

Stage 2: Launch of the green bond

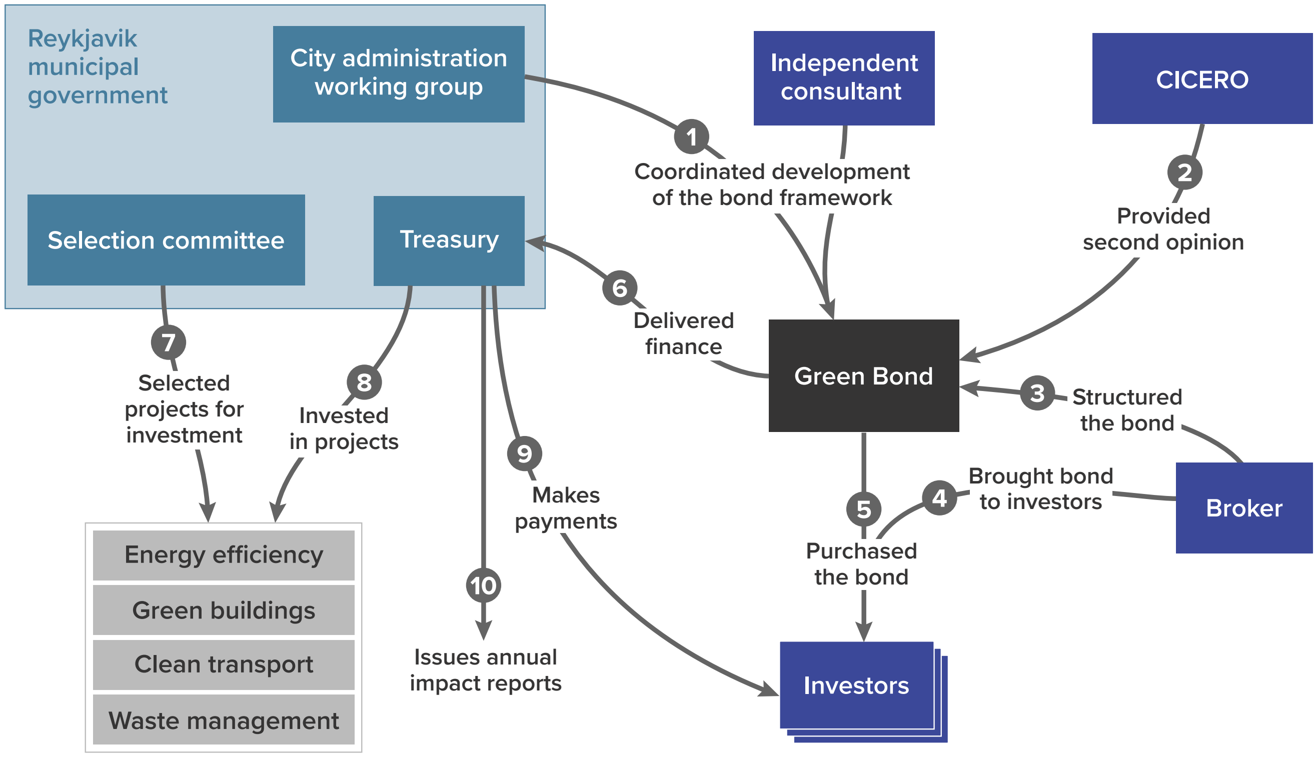
- **Financial broker hire**: Reykjavík hired a financial broker to take the green bond to investors. The financial service provider structured the price and terms of the bond in consultation with the Treasury (annual interest rate of 2.4% paid on a semi-annual basis and tenor of 30 years).
- **Meetings with potential local investors**: The broker pitched the bond to Icelandic pension funds and other investment funds, presenting (a) the green bond concept to sensitize investors not familiar with the market, (b) the green bond framework explaining the use of proceeds, and (c) Reykjavík's financial situation to assure investors that the city would be able to pay back the bond.
- **Deadline for offer submissions**: Reykjavík set a deadline for investors to submit their financial offer – i.e., how much they wanted to invest in the bond. Investors were presented with a 'take it or leave it deal' – meaning that terms of the bond were set.
- **Bond sale**: Investors paid for the bond into a separate bank account managed by Reykjavík's Treasury and received an electronic copy of their shares. The bond was then "admitted for trading" and listed on the Nasdaq Reykjavík stock exchange.

Stage 3: Infrastructure financing, reporting, and repayment

- **Selection Committee formation**: The Committee – composed of officials from Reykjavík's Office of Finance, Office of Environment and Planning, and the Office of Property - was created to decide the projects eligible for financing using the bond proceeds.
- **Projects shortlisting**: The Committee shortlisted projects by screening them against investment criteria set out in the framework and expected environmental benefits in terms of climate mitigation and resilience analyses carried out by experts.
- **City council approval**: The Committee presented the final list of projects to Reykjavík's City Council for final approval.
- **Financing**: The Treasury transferred funds to separate project accounts tagged in the system as a green bond project to facilitate future auditing.
- **Reporting**: Reykjavík releases an annual green bond impact report outlining the investments made using proceeds from the green bond.

- **Repayment**: Annual interests are paid by the treasury revenues from tax and real estate transactions, and once the bond reaches maturity, it will repay the principal to investors.

Figure 2: Reykjavík green bond financial mechanism



4. IMPACT

Reykjavík's experience provides valuable insight for other cities looking to issue green bonds, specifically in contexts where green finance markets have not yet been developed. The green bond success led to the issuance of subsequent bonds in 2021, totaling ISK 18.7 billion (USD 130 M) in green infrastructure financed with green bonds. Together, all green bonds issued by Reykjavík before 2022 led to the following:

- **GHG emissions:** total avoidance of 45,034 tCO2e – breakdown in Table 1.

Table 1: GHG emissions avoided by Reykjavík's green bond investments per year (tCO2e)

Category	Project	2016	2017	2018	2019	2020	2021	Total
Green buildings	Reykjavík swimming pool	-	-	3.1	2.8	3	4.4	13
	School building	2.6	2.1	1.9	2.3	2.6	2.7	14
	Working station	-	-	-	-	3.1	3	6
Energy efficiency	LED street lighting	-	2	2	15.6	15.1	21.6	56

Category	Project	2016	2017	2018	2019	2020	2021	Total
Clean transport	Walking and cycling paths	83.3	202.2	351.7	418	516.2	350.5	1,922
	Garbage trucks	41.2	25.6	51.7	74.3	68.7	520.6	782
	Electric vehicles	-	1.2	4.4	5.6	12.1	18.8	42
	Charging stations	-	-	3.3	18.4	34.4	50.7	107
Sustainable land use	Wetland reclamation	-	-	-	141.3	341.4	342.4	825
Waste management	Gas and composting plant	-	-	-	-	2436.4	38,830	41,267
Totals		127	233	418	678	3,433	40,145	**45,034**

Source: Adapted from City of Reykjavík, 2022

5. KEY TAKEAWAYS

This section summarises key takeaways based on the blueprint analysis and is divided into "Challenges" and "Success factors."

5.1 CHALLENGES:

- **Limited experience of city officials and investors in issuing municipal green bonds.** By 2018, no green bonds issued in Iceland had been opened to Icelandic investors. This meant that all actors had to rely on external support and learn by doing.
- **Lack of systems and processes to screen eligible projects.** Reykjavík had to develop eligibility criteria to filter projects eligible for green bond financing, train staff to undertake analysis, develop systems to tag projects as "green," and develop accounting processes to allocate finance to specific accounts which could be audited. Developing systems for projects with mixed 'green' and 'brown' (i.e., involving fossil fuel) components was particularly tricky. However, once these systems were established, officials from different departments (e.g., Treasury and Planning) could collaborate more on investment planning than they had previously.

5.2 SUCCESS FACTORS

- **Bond issuance experience.** Reykjavík routinely issues public debt to access finance for its infrastructure investments, and this knowledge was leveraged in the issuance of its green bond.
- **Support from advisors with a green bond issuance track record.** To build internal capacity on green municipal debt issuance, Reykjavík hired an external advisor to bring their expertise working on green bond issuance elsewhere to advise on its green bond framework elaboration. This support helped ensure the framework followed international best practices, such as integrating the Green Bond Principles and hiring an external party to provide their "second opinion" on the framework.

- **Private sector capacity-building.** The financial broker hired by Reykjavík helped explain to potential bond investors unfamiliar with sustainable finance the concept of green bonds, highlighting the advantages of investing in this financial instrument.
- **City leadership and partnership between administrative departments.** Reykjavík benefited from key political "champions" in the city administration to collaborate and drive its green finance agenda. For instance, the former Chief Financial Officer of Reykjavík recognized the potential for green bonds to bring in new sources of finance for the city's climate action plan and advocated that the city take the lead on issuing the first green bond in Iceland.

FURTHER READING:

1. CICERO (2018). Second Opinion on the City of Reykjavík's Green Bond Framework. CICERO Shades of Green. Available at https://Reykjavík.is/sites/default/files/second_opinion_on_the_city_of_Reykjavíks_green_bond_framework.pdf
2. City of Reykjavík (2018). The City of Reykjavík Green Bond Framework. Available at Environmental Finance. Available at https://Reykjavík.is/sites/default/files/graenn_rammi_Reykjavíkurborgar.pdf
3. City of Reykjavík (2021). City of Reykjavík Climate Action Plan for 2021-2025. Available at https://Reykjavík.is/sites/default/files/Reykjavíkclimateactionplan2021-2025.pdf
4. City of Reykjavík (2022). 2021 Annual Green Bond Impact Report. Available at https://Reykjavík.is/sites/default/files/2022-06/FAS%2022040002%20Áritun%20Green%20Bond%202021%20sameinað.pdf

MANILA WATER'S SUSTAINABILITY BOND

1. CONTEXT

Manila Water (MW) is a publicly listed company with a concession agreement with the Metropolitan Waterworks and Sewerage System to provide water and wastewater management services to more than seven million citizens in Metropolitan Manila, the Philippines. The company, which typically financed its investments through local bank debt, had to pursue new approaches to access finance in 2020 due to the looming external uncertainties in the domestic market following the COVID-19 pandemic.

2. CONCEPT

In July 2020, MW issued a USD 500 million sustainability bond to international investors with environment, social, and governance (ESG) lending portfolios to raise finance investments in water and wastewater management in Metropolitan Manila. Infrastructure financed included new household connections to the water grid, improved water conveyance by upgrading aqueducts, and water and wastewater treatment facilities.

The company's strategy to pursue finance from international lenders, specifically investors with ESG portfolios, opened up a lucrative new source of finance for Manila Water and allowed it to diversify its debt portfolio. As an early market leader in sustainable debt issuance within the Philippines, Manila Water is now well-positioned to access further ESG finance from international capital markets.

3. INSTRUMENT MECHANICS

The issuance of the MW sustainability bond followed three stages:

Stage 1: Development of sustainable financing framework

- **Sustainable financing framework:** MW developed its framework in line with the Green Bond Principles 2018, the Social Bond Principles 2018, and the ASEAN Sustainability Bond Standards 2018, outlining its policies and processes for (a) using proceeds, (b) evaluating and selecting projects, (c) managing funds, and (d) reporting impact.
- **Second opinion**: MW hired DNV GL Business Assurance Australia Pvt Ltd to deliver a second opinion for the framework, who confirmed the bond was aligned with the international standards.

Stage 2: Launch of the sustainability bond

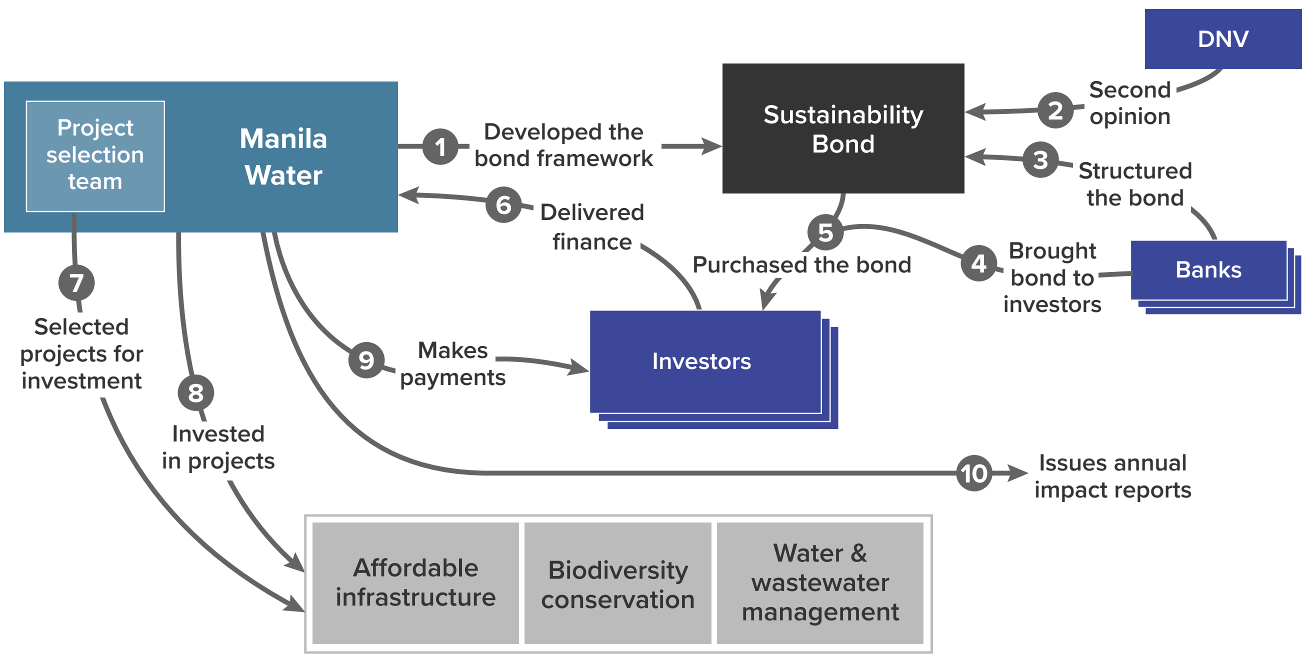
- **Financial broker hire**: MW hired a group of banks to that the bond to market - BPI Capital Corporation, Citi, Credit Suisse, HSBC, Mizuho Securities, and UBS acted as joint bookmakers for the bond, helping determine its terms (annual interest rate of 4.375% paid on a semi-annual basis and tenor of 10 years) advertising it to international investors and managing financial transactions.

- **Bond sale**: Investors submitted their orders to purchase the bond to the banks leading the transaction - banks facilitated settlement, after which funds were transferred to MW. The bond was then listed on the Singapore Exchange.

Stage 3: Infrastructure financing, reporting, and repayment

- **Project selection team formation**: The team – composed of Manila Water's Chief Executive Officer, Chief Financial Officer, Chief Operating Officer, Head of Strategic Asset Management, Deputy Group Treasurer, and Chief Sustainability Officer – was created to screen projects eligible for investment.
- **Project screening**: Projects were screened against the three eligibility categories for the use of proceeds (a) sustainable water and wastewater management, (b) terrestrial and aquatic biodiversity conservation, and (c) affordable basic infrastructure.
- **Financing**: Selected projects were financed with construction starting already in 2020.
- **Reporting**: *MW releases on an annual basis the impact of the sustainability bond and status of proceeds allocation using metrics outlined in the bond framework.*
- **Repayment**: Annual interests are paid to investors, and once the bond reaches maturity, it will repay the principal to investors – MW may also opt for refinancing the bond through further capital market issuance, bilateral loans, syndicated loans, or internally generated loans.

Figure 3: Manila Water's sustainability bond financial mechanism.



4. IMPACT

This blueprint shows how private sector companies can use sustainability bonds to deliver green investment for critical city infrastructure investments. MW's success in issuing the bond is reflected in the fact that the bond was oversubscribed nearly four times, attracting USD 1.96 billion in orders from 85 institutional investors - 80% of the orders were allocated to investors in Asia. In contrast, the remaining were allocated to investors in Europe, the Middle East, and Africa.

MW has released annual sustainability reports since 2005. These reports also provide yearly updates on the impact of the 2020 sustainability bond. Since the bond was issued, Manila Water has achieved the following results[5]:

- **Increase in water supply:** 100 million liters per day of additional water supply capacity was added.
- **Water efficiency:** 50-80 million liters per day of water has been saved due to increased water transmission efficiency.
- **Pollution reduction:** 394 tons of biochemical oxygen demand has been diverted from rivers.

5. KEY TAKEAWAYS

This section summarises key takeaways based on the blueprint analysis and is divided into "Challenges" and "Success factors."

5.1 CHALLENGES:

- **Ensuring robust and transparent data to back sustainability finance frameworks and avoid "greenwashing."** Accurate data is critical to showing the public that the company's investments are being used for positive social and environmental outcomes. However, identifying appropriate indicators and delivering robust sustainability data may require extra time and resources. MW, in particular, engaged third-party experts to ensure that its projects and reporting of outcomes are consistent with its framework.

5.2 SUCCESS FACTORS:

- **Growing demand from ESG investors.** Increasing demand from international institutional investors for bankable green and sustainability investments was crucial to negotiate the bond, which was oversubscribed multiple times successfully.
- **Sustainability reporting track record.** MW benefited from its expertise in reporting its sustainability impact annually when developing its sustainable financing framework, particularly the reporting procedures. The company's sustainability reputation also supported attracting ESG investors and mitigating its "greenwashing" risks.

5 The impact data for the green bond is based on audited data as of December 2021.

- **Group of banks taking the bond to market.** Hiring and coordinating a group of banks with complementary investor networks) for taking the bond to market was crucial for its successful sale, particularly due to its large size.
- **Development of the bond sustainable financing framework following international best practices.** For instance, the bond followed the Green Bond Principles 2018, the Social Bond Principles 2018, and the ASEAN Sustainability Bond Standards 2018. A third party was hired to issue a "second opinion" on the framework.

FURTHER READING:

1. Domingo, R. (2020). Manila Water raises $500M from the sale of sustainability bonds. Philippine Daily Inquirer. Available at https://business.inquirer.net/303529/manila-water-raises-500m-from-sale-of-sustainability-bonds
2. DNV GL (2020). Manila Water Company Inc. Sustainability Bond. DNV GL Eligibility Assessment. Available at https://www.manilawater.com/storage/files/1/corporate/ckeditor-files/2020%20Second%20Party%20Opinion.pdf
3. Manila Water (2020). Sustainable Financing Framework. Available at https://www.manilawater.com/storage/files/9/manila-water-investors/Sustainability/Manila%20Water%20Company%20Inc%20-%20Sustainability%20Financing%20Framework%20July%202020.pdf