



# Improving Local Enabling Conditions for Private Sector Climate Investments in Cities

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# EXECUTIVE SUMMARY

**This report explores the barriers, best practices, and recommendations to improve local enabling conditions to attract private sector capital to support climate investments in cities of emerging economies.** The analysis was informed by a literature review, five case studies with inputs from stakeholders involved in the projects' development, eight key informant interviews, and feedback received from eleven technical experts.

**Barriers to private urban climate investments can be found at the macro, city, and project levels.** Recognizing interlinkages and interdependencies between different levels, two defining themes at the **macro level** concern (i) the macroeconomic context, and (ii) the institutional and policy context – both of which city governments have very limited means to influence. Barriers at the **city level** can be more directly influenced and overcome by city governments – with challenges found under the themes of (i) policymaking, planning, and capacity, and (ii) financial and asset management. At the **project level**, key barrier themes are (i) project design and structuring, and (ii) sector maturity and technology readiness – with city governments having some ability to overcome related challenges.

**There is an increasing number of good practice cases** where city governments have successfully accessed private sector finance for climate investments. Five case studies from emerging economies, covering different financing mechanisms and sectors, have been explored. In summary, **key success factors** include at (i) the macro level: clear and supportive policy and regulatory frameworks, (ii) the city level: transparent working practices accompanied by activities to reduce risks and enhance return on investments, and (iii) the project level: strong coordination and engagement of stakeholders, innovative implementation mechanisms to reduce high transaction costs, and pilot projects to prepare scaling up.

**The report offers a set of recommendations to improve local enabling conditions** targeting components including (i) systems (legal, regulatory, and policy environment), (ii) capacities (skills, experience, and personnel availability), (iii) resources (financial means, assets, and data), (iv) processes (steps, practices, and collaboration to plan, develop, and implement climate actions), and (v) mechanisms (implementation features and instruments to enable bankable climate investments). Our recommendations for specific actors are:

- **City governments:** Strengthen and streamline city planning, finance processes, and capabilities towards improved project preparation. Prioritize climate investments where the private sector can propose solutions and city governments procure services (not 'hardware') to achieve climate impact.
- **Public sector partners:**
  - **National and state/provincial governments:** Provide policy direction and financial resources for subnational climate action, supported by standardized

green finance and procurement instruments, as well as market-making incentives – maximizing the function of national development banks with an established corporate climate governance.

- **International finance institutions and climate funds:** Tailor instruments and support urban climate investments through programmatic interventions, focused on additionality and risk mitigation.
- **Private and third sector partners:**
  - **Financial entities** (e.g. banks): Shift investment portfolios towards climate action, with more aggregation, co-investment in funds, and risk mitigation.
  - **Non-financial entities** (e.g. infrastructure companies): Propose climate project solutions for city governments through multi-stakeholder approaches.
  - **Third sector entities** (e.g. NGOs): Prioritize bespoke capacity development and provide innovation funding and test-beds, while supporting match-making.

# CONTENTS

<b>EXECUTIVE SUMMARY</b>	<b>1</b>
<b>1. Context</b>	<b>4</b>
<b>2. Barriers</b>	<b>6</b>
2.1 Macro Level	7
2.2 City Level	10
2.3 Project Level	11
<b>3. Learning from Good Practices</b>	<b>14</b>
3.1 Case Studies of Delivering Urban Climate Action	14
Case Study 1: Reducing Transaction Costs through Bulk Green Procurement of Electric Buses	15
Case Study 2: Promoting Eco-Tourism via Equity Investment	16
Case Study 3: Overcoming Financing Barriers for Public Street Lighting through PPPs	17
Case Study 4: Municipal Green Bond for Climate Resilience in the Water Sector	18
Case Study 5: Creating Opportunities for Private Sector Involvement in Solid Waste Management	19
3.2 Success Themes	21
<b>4. Recommendations</b>	<b>25</b>
4.1 Recommendations for City Governments	25
4.2 Recommendations for Public Sector Partners	30
4.3 Recommendations for Private and Third Sector Partners	36
<b>5. Conclusion</b>	<b>42</b>
<b>APPENDIX A: Case Studies</b>	<b>43</b>
Case Study 1: Reducing Transaction Costs Through Bulk Green Procurement of Electric Buses in Santiago, Chile	43
Case Study 2: Promoting Eco-Tourism via Equity Investment in San Cristobal Island, Ecuador	48
Case Study 3: Overcoming Financing Barriers for Public Street Lighting through PPPs in Odisha State, India	51
Case Study 4: Municipal Green Bond for Climate Resilience in Cape Town, South Africa	54
Case Study 5: Paving a Path for Innovation in the Solid Waste Sector in Gaziantep, Turkiye	57

# 1. CONTEXT

**Uncertainties and crises are defining features of our current time.** As a post-COVID world emerges, cities seek a green recovery. At the same time, the public and private sectors, as well as citizens, face the interlinked challenges of the energy crisis, cost of living crisis, unfolding currency inflation, and recession. These macroeconomic pressures add to a growing list of challenges linked to the climate crisis. There is a clear need to achieve net zero while climate-proofing existing livelihoods, assets, and future investment and development. Emerging economies, and in particular their cities, face this daunting setting against a backdrop of lower capacity, governance shortfalls, increasing debt burdens, and lack of investment and maintenance of their infrastructure – the public sector alone cannot sufficiently tackle these challenges.

**However, city governments have long focused on public, often concessional, finance for climate projects.** This approach falls short of bringing the transformational change to enable sustainable and green urban development. The International Finance Corporation estimates a **USD 29.4 trillion climate investment opportunity to be realized by 2030 in emerging economy cities** in six primary sectors: (i) waste, (ii) climate-smart water, (iii) renewable energy, (iv) electric vehicles, (v) public transport, and (vi) green buildings.<sup>1</sup> Reaping this opportunity will require all actors from large-scale investors to small and medium enterprises (SMEs) at the city scale. But given the finance need, varying size, and differing requirements of urban climate action across sectors, cities in emerging economies have to improve the enabling conditions to attract private sector investment and deliver faster innovation.

**This report explores the barriers (Chapter 2), lessons from good practices (Chapter 3), and recommendations (Chapter 4) to improve local enabling conditions to attract private sector capital to support climate investments in cities of emerging economies.** The analysis was informed by a literature review, five case studies with inputs from experts involved in the projects' development, other good practices as referenced throughout the report, eight key informant interviews, and feedback received from eleven technical reviewers.

The report uses the following definitions:

- **“Local enabling conditions”:** The institutional, technical, and financial aspects that characterize the framework under which urban climate action can happen.
- **“Urban climate action / projects”:** Investments in climate mitigation and adaptation solutions for cities, as well as accompanying activities (their planning, design, procurement, construction, commissioning, operation and maintenance) undertaken – depending on the governance context – by district, municipal, county, metropolitan, or regional governments together with their public, private, and third sector partners.

<sup>1</sup> IFC. 2018. Climate Investment Opportunities in Cities – An IFC Analysis. Washington, D.C. [https://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/climate+business/resources/cioc-ifc-analysis](https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/climate+business/resources/cioc-ifc-analysis)

- **“Private sector climate investments in cities”**: The participation of private sector entities in the technical and financial development, delivery, and management of urban climate projects, with a focus on scenarios where city governments are involved either directly (co-owners of projects/investments) or indirectly (approvers/regulators/planners, etc.). As such, several types of private sector entities are considered, including banks, private equity funds and asset managers, insurance companies and pension funds, as well as infrastructure and private utility companies.

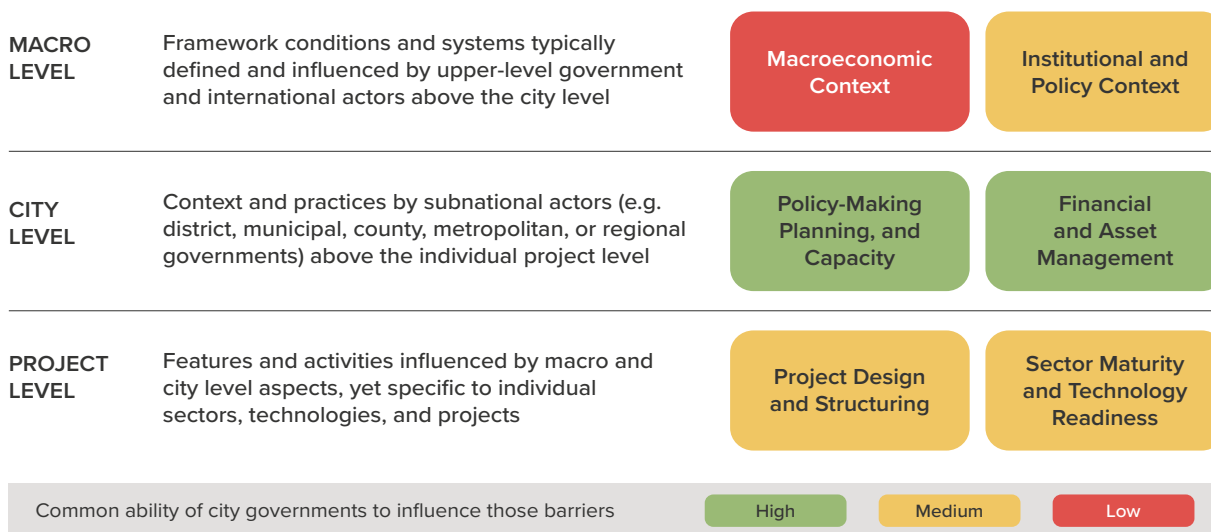


## 2. BARRIERS

**Barriers to private sector urban climate investments can be found at the macro, city, and project levels** (Figure 1). There are interlinkages and interdependencies between different levels, which should be recognized and built into efforts to overcome specific barriers. One example of barrier interdependency is when choosing a different procurement approach for an urban climate project in specific sectors (project level) may be dependent on national procurement regulations (macro level).

Barriers to climate investments have been analyzed extensively<sup>2</sup>. They can be classified by regulatory features, capacity, (financial) resources, and technical (infrastructural) aspects. For easier referencing in the case studies (Chapter 3) and recommendations (Chapter 4), the barriers in this chapter have been organized under two primary themes at each level: Macro Level – (i) macroeconomic context, and (ii) institutional and policy context; City Level – (i) policymaking, planning, and capacity; and Project Level – (i) project design and structuring, and (ii) sector maturity and technology readiness.

Figure 1. Barriers to Private Sector Urban Climate Investments



Source: AECOM, 2022.

<sup>2</sup> Interested readers may refer to the following publications for a more in-depth discussion on barriers beyond the summarized presentation in this report:

White, Roland, and Sameh Wahba. 2019. Addressing constraints to private financing of urban (climate) infrastructure in developing countries. *Urban Sustainable Development* 11(3). P. 245-256. [https://www.ifc.org/wps/wcm/connect/topics\\_ext\\_content/ifc\\_external\\_corporate\\_site/climate+business/resources/cioc-ifc-analysis](https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/climate+business/resources/cioc-ifc-analysis)

Floater, Graham, et al. 2017. Global Review of Finance for Sustainable Urban Infrastructure. Background Paper. Washington and London (Coalition for Urban Transitions). <https://www.lse.ac.uk/cities/Assets/Documents/Working-Papers/Global-Review-of-Finance-for-Sustainable-Urban-Infrastructure-Graham-Floater.pdf>

UNDP. 2020. Catalyzing Private Sector Investment in Climate Smart Cities. New York. <https://www.undp.org/publications/catalyzing-private-sector-investment-climate-smart-cities>

CCFLA. 2021. The State of Cities Climate Finance. Part 1 – The Landscape of Urban Climate Finance. London. [https://www.climatepolicyinitiative.org/wp-content/uploads/2021/06/SCCF\\_PART1-FINAL-1.pdf](https://www.climatepolicyinitiative.org/wp-content/uploads/2021/06/SCCF_PART1-FINAL-1.pdf)

## 2.1 MACRO LEVEL

Barriers at the macro level concern aspects that are typically defined above a city government's level of authority and area of influence and are summarized below under the themes of (i) macroeconomic context, and (ii) institutional and policy context. Depending on the governance system, these barriers may be found at the state/provincial level (e.g. in federal countries), or primarily at the national level (e.g. in centralized countries). However, these barriers also concern regional and even global aspects that create or hinder a conducive framework under which private sector urban climate investments can be facilitated. City governments have limited ability to change macro-level barriers, as further outlined in the following sections.

### MACROECONOMIC CONTEXT

**Macroeconomic factors shape the context within which urban climate investments take place.** For instance, where the economic and financial markets of a country are nascent or limited in size, access to different capital for climate investments (let alone at the city level and with private sector participation) can be challenging – this concerns both domestic finance and foreign investment. It can have further repercussions on the local markets for certain climate technologies, which may struggle to attract sufficient financial resources to move from early-stage innovations to tested and scalable solutions.

**Creditworthiness is widely recognized as a key challenge** city governments face in accessing available financial instruments and sources. Factors such as a country's currency risks (linked to challenges around inflation or foreign debt) and high domestic interest rates can create a 'credit ceiling'<sup>3</sup> to cities and significantly constraint subnational government entities from achieving investment-grade status and bond issuance. This problem can even influence the credit rating of private sector entities. What is already challenging for 'plain vanilla'-type investments may be even harder for innovative climate projects that struggle to attract investors willing to accept the double risk of credit and technology readiness.

### INSTITUTIONAL AND POLICY CONTEXT

**The performance of national and subnational governance has a significant impact on the investment climate.** In country settings where the rule of law is limited or where legacy colonial bureaucracies and procedures prevail, processes can be overly time-consuming and costly or planning, financing, and procurement processes may be untransparent. This, in turn, can be exacerbated by a chronic lack of public resources and capabilities for already constrained city administrations in emerging economies. With the 'ease of doing business' being inhibited<sup>4</sup>, the private sector is likely to lack the confidence that its investments and partnerships with the public sector can be sufficiently commercially successful and legally safeguarded.

<sup>3</sup> Floater, Graham, et al. 2017. Financing the Urban Transition: Policymakers' Summary. London and Washington, DC (Coalition for Urban Transitions). <http://newclimateeconomy.report/workingpapers/workingpaper/financing-the-urban-transition-policymakers-summary/>

<sup>4</sup> The World Bank is replacing the previous 'ease of doing business' report and ranking with a new Business Enabling Environment, see here: <https://www.worldbank.org/en/programs/business-enabling-environment>

**National-level laws and regulations shape public revenues**, and how those revenues are collected and distributed across different levels of government. Many centralized countries have less financial autonomy permitted at the city level, which can hinder city governments' ability to manage their own budgets and generate their own revenues – this, in turn, can hinder achieving creditworthiness and attracting private sector investment and a diversified source of finance for climate projects. In cases where the devolution of powers from the national to the subnational level is not accompanied by fiscal decentralization, city governments struggle to own, manage, and allocate their financial resources effectively.

**National regulations are also relevant in terms of (dis)allowing private sector investment** in certain municipal infrastructure sectors, such as water, housing, or waste. Policies may also restrict foreign direct investment or similar contributions of international partners in urban climate investments. Procurement laws and policies are other examples where the national level may define a specific legal regime that city governments must abide by, which could, for instance, prevent the weaving of climate-positive selection criteria into local procurement processes.

**Subnational governments seeking to leverage private and public climate finance will often need to demonstrate their alignment with national commitments** (e.g., Nationally Determined Contributions, National Adaptation Plans, Green Growth Strategies, national infrastructure planning agendas, etc.). A dearth of climate commitments at the national level can make it difficult for city governments to develop their own plans and investment opportunities that can utilize national-level support for private urban climate investments, particularly where nationally set priorities do not align well with a city's specific climate mitigation and adaptation challenges and priorities (e.g. an emerging economy national government may prioritize a majority of climate investments towards coastal protection and water-efficient agriculture, while a city government in a mountainous area may be more concerned with earthquake-proofing its housing sector while scaling up rooftop solar and energy-efficient retrofitting of buildings). Such misalignment of investment priorities may be further hindered by differences in political alliances at the national and subnational level, which may prevent approvals and resource flow towards certain cities or investments.

While the national-level institutional and policy context may not necessarily create barriers to private sector urban climate investments, the degree of autonomy and resources available at the subnational level will influence the number of options that city governments have at their disposal to overcome some of the barriers discussed in the subsequent sections.

## 2.2 CITY LEVEL

Most barriers at the city level fall under two main themes: (i) policymaking, planning, and capacity, and (ii) financial and asset management. **Barriers at this level often have a 'subnational' designation**; however, they typically go beyond individual investments (see next section) and concern institutional challenges.

## POLICYMAKING, PLANNING, AND CAPACITY

Governance barriers at the city level can involve challenges on policymaking, planning processes, as well as significant capacity and resourcing constraints – all of which can impact a city’s ability to deliver climate action and attract investment, particularly from the private sector.

In terms of **capacity**, governments in cities of different sizes and development contexts experience different shortfalls – from basic service delivery to more specific climate action planning and implementation. Capacity requirements vary between cities, governance systems, and geographies, accordingly impacting on local climate action.

In some city governments, organizational barriers – such as the lack of coordination between investment/finance departments and sector/technical departments - can impede the identification, preparation, and implementation of bankable urban climate projects that can attract private sector participation. Instead of siloed approaches, city governments can benefit from streamlined and collaborative investment planning and project preparation processes as further illustrated in Chapter 4.

Some city governments require better financial literacy among their staff.<sup>5</sup> This represents a profound climate investment barrier as without an understanding in financing, city government staff will struggle to consistently and sustainably generate revenue and understand sector-specific regulations and financial options available for different climate projects. Demonstrating sustainable revenue generation can improve creditworthiness, and in turn attract private sector investors.

In other contexts, the lack of the right systems (e.g. in digital data management), tools (e.g. using GIS mapping), and technologies (e.g. for air quality monitoring) may limit city governments’ capacity to assess the specific climate risks that their city may be exposed to and to monitor environmental performance of climate investments to track impact towards risk mitigation and co-benefits. Both points are critical as they will influence how well city governments can scope and define the most impactful climate projects and in how far they can apply outcome-based monitoring as a key component of certain financing instruments, for instance in PPPs or green bonds.

Barriers at the city level may also be experienced where no **overarching local climate strategy** exists or where **senior leadership and political buy-in** is missing to translate such strategy into an action plan of prioritized investments backed with funding. Similar to the national level, city-level policymaking can be critically important to help steer private sector investment toward climate action.

Additionally, the level of **understanding of how the legal and regulatory frameworks function** can enhance or inhibit private sector participation in urban climate investments. This includes the application of various financial instruments and business models, options to devise or adjust municipal sector regulations and standards/codes, or differing approaches for municipal revenue generation.

5 Farvacque-Vitkovic, Catherine, and Mihaly Kopanyi. 2019. Getting the Finances in Order: The Municipal Finances Self-Assessment. In: World Bank. 2019. Better Cities, Better World: A Handbook on Local Governments Self-Assessments. Washington, D.C. [https://elibrary.worldbank.org/doi/10.1596/978-1-4648-1336-8\\_ch3](https://elibrary.worldbank.org/doi/10.1596/978-1-4648-1336-8_ch3)

Looking at the **relationship between city governments and the private sector** in emerging economies, private sector actors may be more powerful or capable due to their resources and knowledge. Where city governments lack sufficient capacity to recognize the existing framework conditions to enable urban climate investments, responsibility may fall to the private sector to perform ground-up research on potential participation in planning, financing, delivering, and operating urban climate projects. The private sector may then refrain from such projects in more difficult contexts in emerging economies, particularly in smaller cities with potentially smaller market opportunities.

## FINANCIAL AND ASSET MANAGEMENT

The creditworthiness and related financial attractiveness of a city government depend on a **foundation of financial fundamentals** which enable sustainable municipal finances. While capacity shortfalls, including in financial literacy, have been discussed in the previous section, this part focuses on the ‘how’ of financial and asset management at the city level. Barriers emerge from sub-standard accounting practices, underperforming revenue generation, ineffective spending, and/or unsustainable borrowing.

**Financial accounting practices** of city governments not aligning with international accounting standards (e.g. IPSAS<sup>6</sup>) is a key impediment to investors, particularly from abroad. Where national guidelines prevent such alignment, city governments may opt for voluntary disclosures alongside country-specific requirements. In reference to cities in emerging economies, the barrier is exemplified by unconsolidated statistics across numerous municipal entities and municipally owned companies. These can create hidden liabilities while also underestimating the leveraging power of city governments. A lack of transparency accordingly inhibits investor relationships and confidence, while also making certain financial instruments, e.g. borrowing, potentially more expensive due to a higher, risk-aligned interest.

Accompanying financial accounting practices is **local revenue generation**. Even within the often-limited confines of own-source revenue generation, city governments in emerging economies have untapped opportunities in collecting taxes, tariffs, and fees from businesses and citizens. While affordability in local government revenue streams is important, the barrier is often rather rooted in outdated, non-digitized, or overly convoluted collection mechanisms that can lead to underpayments, payment evasion, or corruption. These problems have direct implications for any private urban climate investment that would rely on revenue generation and collection as a means of funding and refinancing and can compromise transparency and the trust of the private sector.

Interlinked with the previously mentioned financial literacy is also the understanding and effort to expand the use of **different financial instruments**. Where city governments rely on only a few common approaches, such as borrowing from national development banks at discounted rates, other options to enable urban climate investments are ignored, including considerations for what the private sector can contribute to certain projects. This lack of ‘options scoping’ prevents city government staff from developing and structuring bankable projects.

<sup>6</sup> IPSASB. 2022. Standards and Pronouncements. <https://www.ipsasb.org/standards-pronouncements>

Besides financial instruments scoping, city governments in emerging economies also need to expand their knowledge of **the assets they own and manage**. Often, options for leveraging municipally-owned assets for revenue generation are underutilized (e.g., land value capture, property leasing, collateral in municipal infrastructure securitization<sup>7</sup>). Even where assets are known, they may suffer under insufficient resource allocation and maintenance (including challenges around fee/fare collection effectiveness to sustain operating budgets). This impacts the performance of municipal assets and makes them commercially more wasteful, resulting in a reduced return on investment – all of which turns private sector away from investing into urban infrastructure that is linked to climate solutions.

## 2.3 PROJECT LEVEL

Moving from the city level to the project level, barriers to private sector urban climate investments can be summarized under two themes: (i) project design and structuring and (ii) sector maturity and technology readiness. While many issues at the city level are firmly under the control of city governments, **project-level barriers often require a concerted effort of the public** (multilateral, national, and subnational) **and private sector actors**. This is linked to urban climate investment projects being comparatively more demanding in their development and execution than traditional ‘grey’ infrastructure projects in cities, such as ring roads or water pipes.

### PROJECT DESIGN AND STRUCTURING

Designing bankable climate projects in emerging economies – often at the national and the subnational level – face multiple barriers to private sector investment, including:

- **Small project size** versus expected transaction costs, with a discrepancy, for instance, between a locally-suitable climate solution requiring an investment of just USD1 million and the ‘ticket size’ sought by external investors, such as international finance institutions (IFIs), climate funds, and private sector investors (particularly institutional investors like pension funds), which may range from USD20 million up to several hundred million.
- **Insufficient financial information and low or uncertain returns**, e.g., in establishing a clear cost-benefit analysis and rate of return on investment, presented in a way that speaks to private sector investors, as well as situations where, e.g., a required tariff increase in a particular sector may be dependent on city council approval, which may face political opposition.
- **Regulatory uncertainty or disincentives**, which can concern sector or technology-specific regulations, procurement, due diligence, and approval-related government processes, or commercial implications from the long-term stability in a given

<sup>7</sup> See for example: G20 Sustainable Finance Study Group. 2018. Towards a Sustainable Infrastructure Securitization Market. Stockholm. [https://q20sfwg.org/wp-content/uploads/2021/07/Towards\\_a\\_sustainable\\_infrastructure\\_securitisation\\_market.pdf](https://q20sfwg.org/wp-content/uploads/2021/07/Towards_a_sustainable_infrastructure_securitisation_market.pdf)  
OECD. 2015. Infrastructure Financing Instruments and Incentives. Paris. <https://www.oecd.org/finance/private-pensions/Infrastructure-Financing-Instruments-and-Incentives.pdf>

subnational or national framework (e.g., for maximum emission standards and carbon credit markets).

- **Risk allocation** between involved parties, e.g. in a public-private partnership (PPP) where public sector and private sector entities cannot reach an agreement on what a fair risk-sharing arrangement would be.

In addition to those technical aspects around bankable project preparation, city governments can also face barriers in the enabling elements of the project cycle. For instance, limited experience in the design and structuring of projects can impede progress in project preparation and deal closure. Involving external service providers in those steps may add additional costs for which city governments may not have the resources for. Urban climate projects involving several parties, including from the private sector, also require a lot of coordination and corresponding spearheading by a dedicated unit in the city government that has the personnel and time to appropriate resource the project preparation and implementation activities.

## SECTOR MATURITY AND TECHNOLOGY READINESS

**Sector maturity and the perceived readiness of certain climate technologies** (e.g., the use of anaerobic digestion in the waste sector) present additional barriers at a project level that are distinct to climate projects. It must be acknowledged that barriers around market size and development are influenced by macro-level aspects, as previously discussed. However, there are also lower-level aspects that can hinder private sector participation in certain sectors and technologies, e.g.:

- **Municipal guidelines and policies** preventing the rollout of a particular technical solution (e.g. housing regulations which permit the use of photovoltaic on rooftops).
- **Limited local contractor capabilities** that limit the availability and capacity for certain climate solutions in a city, particularly beyond large-scale urban areas (e.g. e-mobility related production and repair providers to respond to electrification of public transport and individual mobility).
- **Insufficient consumer demand** that makes it unattractive for external companies to provide services and products to a city (e.g. providing energy-efficient construction services in a context of fairly low cost local construction materials and low electricity costs).
- **Small market size** where the potential to expand and replicate a given climate solution is limited (e.g. provision of nature-based solution designs for flood reduction around urban wetlands in geographies where only few such locations remain).
- **Risk aversion** linked to newer technologies which have not run through their projected lifespan so that their performance can be ascertained (e.g., vertical farming), this lack of performance data and experience often introduces a level of risk and uncertainty beyond the private sector's appetite.

A defining feature linked to these aspects is the challenge around a missing track record. Similar to non-climate projects, private sector investors want to have a reference case for how a climate solution in a particular sector and location has worked before

and what expected impacts from such project may be. Where no comparable cases can be found and where a development would happen on a 'greenfield', city governments will struggle to attract private sector participation. Chapter 4 offers recommendations on how to address this.

While it is often already difficult for city governments to overcome barriers of private sector participation in traditional projects in the urban space, the **complex nature of climate investments** can make it even harder. **Higher transaction and due diligence costs** are a significant barrier. Climate projects often require compliance with non-financial terms of green finance, which can impose greater implementation challenges and reporting duties. The wide range of climate investment types and sectors creates varying capital costs (due to local conditions, and differences in design, procurement, engineering, management, and maintenance), potentially impacting on reduced returns and increased project finance and funding needs.



## 3. LEARNING FROM GOOD PRACTICES

While several barriers can hinder investment in climate projects, there is an increasing number of examples where city governments have successfully accessed private sector finance to deliver urban climate investments. In this chapter, five case studies are summarized to reflect on key lessons learned and the factors that enabled these projects to succeed. Key aspects for each case study will be presented, with the aim of supporting replication in other geographic and governance contexts.

Interested readers can find a more detailed overview in Appendix A, including a breakdown on the stakeholders involved in the implementation and financing process, delivery timeframe, enabling conditions, the barriers encountered during the implementation, prerequisite tasks, key lessons learned from the project, and a detailed description of the intervention itself.

### 3.1 CASE STUDIES OF DELIVERING URBAN CLIMATE ACTION

In the following section, five case studies on urban climate action from different regions of the world are summarized – with references to the barriers discussed in Chapter 2 (Figure 2) and with linkages to the recommendation components presented in Chapter 4 (Figure 4). Box 1 explains how the case study selection was undertaken.

#### Box 1. Case Study Selection Process

To identify good practice from existing projects, the aim was to draw lessons from a range of cities, covering a variety of sectors and geographies. A long list of case studies was identified following a review of publicly available information, categorized under the following **sectors**: Urban Sustainable Energy Solutions, Waste Management, Water Management, Adaptation / Resilience (including Nature-based Solutions), Transport and the Built Environment. Only recent projects, or those under implementation at the time of writing this report, were considered. A short list of case studies was then prepared, aiming to cover **emerging economies in different geographical regions** – namely, Latin America, Southeastern Europe/Middle East, Africa, and Asia-Pacific. Additionally, a **range of financial mechanisms** was meant to be represented by the final selection of cases. The shortlist of case studies was shared with members and the secretariat of the Enabling Frameworks Action Group of the CCFLA, before five examples, based on the innovativeness of the approach, potential for replication, sectoral and geographical focus, were chosen for detailed analysis as presented in this chapter and the appendix.

## CASE STUDY 1: REDUCING TRANSACTION COSTS THROUGH BULK GREEN PROCUREMENT OF ELECTRIC BUSES

**Location:** Santiago, Chile

**Mechanism:** Public-private partnership (PPP) with bulk procurement

**Barriers encountered for implementing the project:**

- **Macro level:**
  - Insufficient regulatory/financial incentive for bus operators to shift to e-buses
- **City level:**
  - Lack of charging infrastructure for electric vehicles
  - High rate of fare evasion meant (perceived) high risk for investors in obtaining returns on investment
- **Project level:**
  - Lack of previous large-scale deployment of electric buses in the country meant there was a (perceived) high risk for investors
  - High upfront costs (2x higher than diesel buses at that time)

**Overview:** The Municipality of Santiago embarked on a mission to transform the public transit system. One of its first steps has been to build investor confidence by tackling a high rate of fare evasion, e.g. through better station access control systems.<sup>8</sup> Subsequently, a pilot scheme was launched with an energy company, Enel X to assess the investment viability of electric buses: several e-buses were purchased and then leased to Metbus, one of the city's largest privately owned public transit operators. Following the success of the pilot, Metbus and Enel X signed a 10-year lease valued at USD 40 million that included a lease for 100 electric buses and charging infrastructure, as well as necessary grid updates in the two electro terminals. At the end of the contract, the assets would be transferred to the lessee (in this case, Metbus). By 2020, a total of 455 electric buses had been procured (this includes e-buses procured by other private bus operators), with the total investment estimated at USD 136.5 million. In March 2021, this figure increased to 776 e-buses, with ambitions to have a fully electric public transportation system in Santiago by 2035.

**Lessons learned:**

- **Systems:**
  - It is important for local authorities to proactively create (even at a small scale) opportunities that would encourage uptake of technologies that could otherwise be perceived as risky – in this case by reducing fare evasion rates.

<sup>8</sup> Several sources consulted in preparation of this case study cite the reduction of fare evasion rate – by, for example, introducing additional access barriers in selected stations – as an important step for attracting private sector investment. However, other sources indicate that this reduction has been very minor, or that it has not been reduced at all.

- In addition to incentives, strong regulation is important to manage competing interests and counter negative by-incentives (e.g. the previous lack of incentives to renew the vehicle fleet).
- **Processes:**
  - Green bulk procurement spread across several phases can significantly reduce transaction costs, especially for investments where the upfront cost is high.
- **Mechanisms:**
  - Contractual modalities that separate ownership, operation, and maintenance of public services can work well in some circumstances (e.g. private sector owns and leases assets to operators, who need to comply with performance indicators set by local government).

## CASE STUDY 2: PROMOTING ECO-TOURISM VIA EQUITY INVESTMENT

**Location:** Galapagos Islands, Ecuador

**Mechanism:** Bridge loan converted into equity investment

**Barriers encountered for implementing the project:**

- **Macro level:**
  - Lack of permissions for investment in the construction of new hotels coupled with a lack of debt financing (local banks do not have sufficient exposure to ecotourism, or the liquidity to support such projects post-COVID) has prevented commercial investors from investing in the Galapagos Islands.
  - Political pushback on developments (including eco-design/build) in the area, for example, there is a moratorium on new hotel permits, due to concerns of the impact of tourism on native ecosystems.
- **Project level:**
  - Lengthy stakeholder engagement process – the project developer undertook seven years of engagement with the local municipality and community groups to secure confidence and buy-in for the project.

**Overview:** The Eco Tourism project is setting out to build a LEED-certified – eco-resort complex, deploying low-impact construction techniques and materials, renewable energy, energy efficiency measures, passive design, and water conservation measures. The project will reduce the number of materials needed by 50% compared to traditional design and implementation. In addition, it has outlined clear environmental, social, and development positive impacts, such as enhancing local employment with gender equity, eradication of invasive species and introduction of native species on the project site, water provision and management to local communities, sustainable sourcing of products by collaborating with local farmers, and a reduction of emissions by up to 50%. To date,

the project has received USD 8.7 million from the Subnational Climate Fund in the form of a bridge loan. This has supported the pre-development phase activities. The total project loan is expected to be approximately USD 55 million, which will be converted into equity during the construction phase.

**Lessons learned:**

- **Capacities:**
  - Working with partners that are familiar with the regulatory framework and cultural context was critical to understanding local challenges and opportunities
- **Processes:**
  - Local partnerships and detailed consultations with the local community proved integral to the success of this initiative to understand the operating environment and opportunities to create inclusive impact
  - Engagement with local partners who have the license to operate in the project's local environment is key
- **Mechanisms:**
  - Identifying a project that has a strong commercial return profile combined with strong environmental and social benefits supported access to finance through the Subnational Climate Fund

## CASE STUDY 3: OVERCOMING FINANCING BARRIERS FOR PUBLIC STREET LIGHTING THROUGH PPPS

**Location:** Bhubaneswar, Berhampur, Cuttack, Rourkela, and Sambalpur in Odisha State, India

**Mechanism:** Project finance, Public Private Partnership (PPP)

**Barriers encountered for implementing the project:**

- **City level:**
  - Limited access to external financing for street lighting upgrades at the municipal level
  - Lack of technical knowledge on structuring, negotiating, and implementing effective PPPs
- **Project level:**
  - High upfront costs for new streetlight technology

**Overview:** The project was financed through a PPP model under an eight-year agreement, where selected private service providers committed to create a special purpose vehicle (SPV) that would be entitled to a 90% capital subsidy of the project cost (this subsidy ultimately came from the Odisha Infrastructure Development Fund).

The remaining 10% would be covered, in the form of equity, by service providers, equivalent to USD 5 million. The project saw the installation of around 40,000 energy-efficient streetlights across the five urban areas and improved service provision through a new control center based on remote operation, real-time monitoring, and predictive repair. In addition to installing new streetlights, the pilot project aimed to improve the existing infrastructure. The program has subsequently been rolled out to other urban municipalities across India.

**Lessons learned:**

- **Systems:**
  - Appropriate regulatory and legislative environment to inspire private sector confidence is key.
- **Processes / Mechanisms:**
  - High transaction costs of PPPs can be offset through investment pooling (in this case, by several municipalities coming together to increase the overall value of what would otherwise be a fairly small investment).
- **Mechanisms:**
  - The importance of isolating risks related to PPP project implementation through a dedicated SPV and setting performance-based indicators and benchmarks against monthly or annual payments.

## CASE STUDY 4: MUNICIPAL GREEN BOND FOR CLIMATE RESILIENCE IN THE WATER SECTOR

**Location:** Cape Town, South Africa

**Mechanism:** Green Bond

**Barriers encountered for implementing the project:**

- **Macro level:**
  - Underdeveloped policy and regulatory environment for green bonds at the national level
- **City level:**
  - Low penetration of financing from the private sector for resilience projects in Cape Town
  - Limited experience/lack of capacity with regulatory agencies and technical details associated with the design of verification and eligibility criteria for green bonds issuance

**Overview:** In 2017, the City of Cape Town wanted to highlight its green credentials and issued a green bond to leverage private capital to support its pipeline of water projects. The green bond was certified by the Climate Bonds Initiative (CBI) and achieved an 'Excellent' rating from Moody's for its governing process and how proceeds are being

used, managed, and reported (this includes having comprehensive criteria for an investment project that are selected and measurable impact of results). The verification of the CBI standard was undertaken by an external assurance provider both pre- and post-issuance of the bond. In total, the bond raised 1 billion Rand (approximately USD 67 million) mainly from financial institutions. Transaction costs borne by the city involved consultancy fees for the assurance process, certification fee for CBI, and originator fees (as per the normal bond process).

**Lessons learned:**

- **Capacities:**
  - This is a replicable project in other geographic and political contexts, but only available for creditworthy cities.
- **Processes:**
  - Clearly defined project pipeline and a well-defined process help to enable transparent selection of priority projects.
  - Strong coordination with relevant stakeholders and clear communication channels are important – in the case of Cape Town, internal communication and coordination were managed through a climate change work group, while external communication was managed by the bond arranger and the mayor’s office. Overall coordination between all actors was led by the Strategic Policy Unit (part of the mayor’s office).
- **Mechanisms:**
  - Green bonds may offer an important solution to local governments’ budget deficit for adaptation and mitigation projects but need to be matched to scale, project types, and spending profile.
  - External certification and verification of green bonds is key, especially in the context of limited previous experience with issuing bonds / inadequate policy and regulatory environment.

## CASE STUDY 5: CREATING OPPORTUNITIES FOR PRIVATE SECTOR INVOLVEMENT IN SOLID WASTE MANAGEMENT

**Location:** Gaziantep, Türkiye

**Mechanism:** Grant (with the potential to leverage future private investment)

**Barriers encountered for implementing the project:**

- **Macro level:**
  - High inflation and currency devaluation (between 2017 and 2022, the Turkish Lira lost 3 times its value over the Euro) meaning that borrowing from

international sources in non-local currency would bear significant exchange rate risk for subnational governments.

- **City level:**
  - Lack of municipal credit rating that would enable additional financing options (e.g. green bonds issuance).
- **Project level:**
  - Limited public financing options for the construction of a Mechanical Biological Treatment Facility.

**Overview:** The city of Gaziantep has experienced a significant increase in population (internal migration and a significant influx of refugees from Syria fleeing the civil war), which meant the existing infrastructure and public services were under strain. No additional funds were made available to the city by the national government and one of the sectors particularly impacted were solid waste services and infrastructure. With a strong technical team and innovative proposal, city officials converted one of its most pressing challenges into an opportunity through the targeted engagement of international development partners by cultivating an image of a welcoming, inclusive city for refugees – at a time when the responses to the ongoing crisis were markedly different across European countries. Funding was received from the European Union, which supported the construction of a Mechanical Biological Treatment Facility alongside other innovative projects. Attracting private sector investment into solid waste sector is significantly more difficult than in other urban infrastructure sectors such as transport and buildings. One of the reasons is that the waste sector is typically not considered as competitive or attractive to investors. Cases of solid waste PPPs are often not particularly innovative or replicable outside their very specific local context and regulatory framework. This case study represents an inspirational take on this challenge, where the local government in Gaziantep was able to make the most out of one of the most pressing urban challenges – rapid population growth – to create a pathway for a more innovative solid waste sector that is potentially better placed to attract more private sector participation in the future. The initial grant funding has been used to introduce technological innovation in solid waste processing and energy production, involving the private sector in the planning and delivery of the infrastructure, contributing to local skills development, showcasing possible financial returns from operating the assets, and illustrating future investment opportunities in a context of growing population and solid waste service needs.

**Lessons learned:**

- **Capacities:**
  - The city’s proactive, targeted approach – in addition to strong technical capacity that helped convince development partners that it would be able to make the most of the investment – was key to the success.
- **Resources:**
  - By cultivating an image of a welcoming, inclusive city for refugees – especially at a time when the responses to the ongoing crisis were markedly

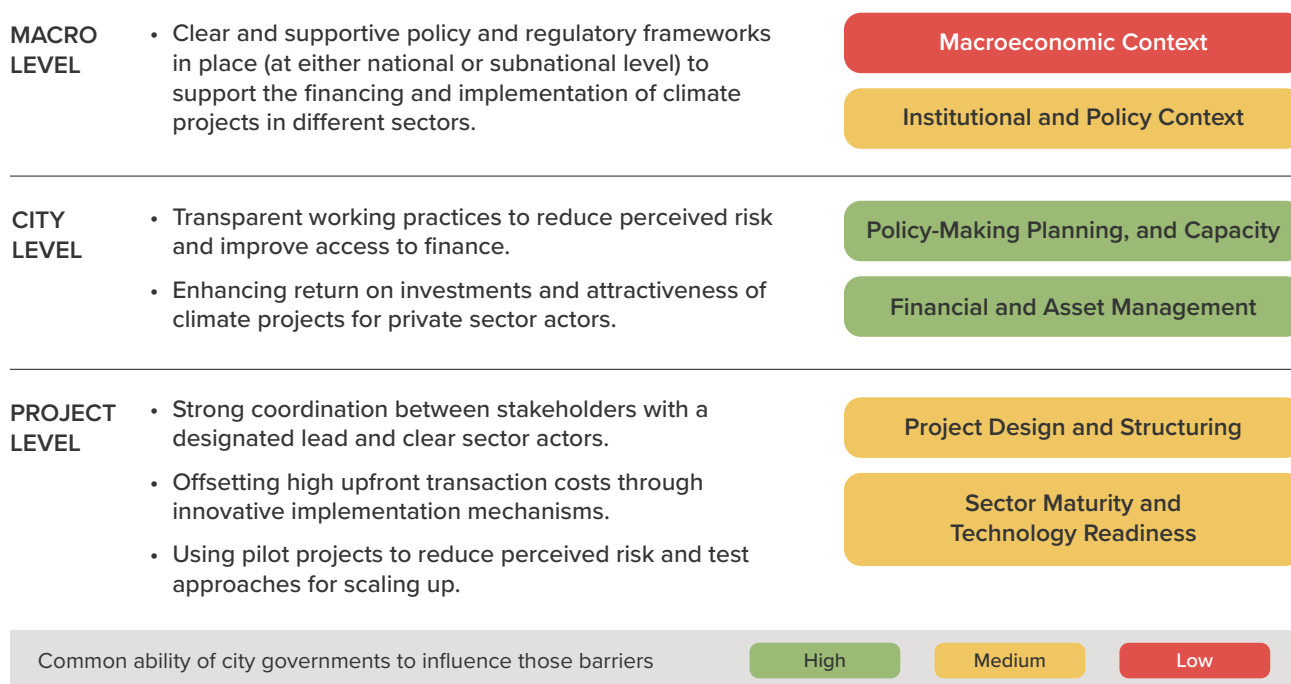
different across European countries – the city was able to attract much-needed funds to address what would have been a long-standing challenge even without the refugee crisis.

- **Processes:**
  - The re-packaging of a key social challenge for the city to access alternative sources of finance to implement an innovative solid waste project.
  - The city successfully created a pathway for a more innovative solid waste sector that may be better placed to attract more private sector participation in the future. As such, this example may serve as an inspiration to other cities looking to make their solid waste sector more innovative, and in the process attract financing from private sources.

### 3.2 SUCCESS THEMES

There are common success themes and lessons learned across the reviewed case studies, which can be used to support the **replication of similar urban projects in emerging economies in other geographical and governance contexts**. The broad themes can be mapped against the barriers discussed in Chapter 2 (Figure 2).

Figure 2. Common Success Themes and Lessons from the Reviewed Case Studies



Source: AECOM, 2022.

### FINDINGS FOR THE MACRO LEVEL

**Need for clear and supportive policy and regulatory frameworks (at either national or subnational level) to engage the private sector in financing and implementing climate projects.**



When city governments have well-defined policy and strategy frameworks in place, this can help drive the implementation of climate projects forward giving confidence in the sector and for the return on investment for private sector actors. This is illustrated in the case of Cape Town, where the subnational climate policies focused on climate change mitigation and resilience (coupled with positive financial management governance), creating an enabling environment and prioritizing climate projects. In Santiago, the shift towards electric buses was supported by both national and local policy (with corresponding targets) aimed at electrifying the public vehicle fleet. In Odisha, the state-level regulatory and legislative environment supported energy efficiency, which was another important enabling mechanism for the public street lighting project in the participating cities.

## FINDINGS FOR THE CITY LEVEL

### **Transparent working practices to reduce the perceived risk and improve access to finance.**

Further to having a clear policy and regulatory framework, a city government that has clear financial reporting mechanisms can unlock access to private sector finance. Demonstrating transparent public financial management and governance, e.g. through the use of tools and frameworks (such as IMF's Public Fiscal Risk Assessment Model tool, OECD best practices for budget transparency, diagnostic frameworks, etc.), along with a strong balance sheet, can ease private sector concerns about possible losses on investments resulting from the misuse of funds.

Commitment to building investor confidence through external certification and verification, especially in the context of limited previous experience or inadequate policy and regulatory environment, can further strengthen governance reputation, as was illustrated by the City of Cape Town before the issuance of the green bond. Further, identifying a well-defined project pipeline, the development of comprehensive investment criteria (with clear investment objectives), as well as ensuring a clear reporting framework (with metrics for measuring the impacts of results) can help reduce the risk for investors looking to support projects, particularly in environments with underdeveloped capital markets, inadequate regulatory environments, or with limited previous experience. Cape Town's green bond issuance process is generally used as an example to underline the importance of these steps and how to undertake them successfully.

### **Enhancing return on investments and attractiveness of climate projects for private sector actors.**

It is important for subnational authorities to proactively create (even at a small scale) opportunities encouraging the uptake of technologies or other innovative solutions to support climate projects, which could otherwise be perceived as risky due to reduced returns. In the Santiago e-bus project, the local authority's commitment to building investors' confidence by reducing fare evasion and addressing key deficiencies of the public transit system supported increased interest from the private sector.

In addition, city governments should be aware of the financing and funding opportunities that are available to them, such as access to dedicated national/state-level infrastructure development funds that can provide grants and loans, as well as capital subsidies for projects. This was observed in the Odisha street lighting project, where the participating cities were able to access additional funds or the technical expertise to support the design of a financial mechanism to best suit their case. It was identified as one of the key success factors for getting the project off the ground and overcoming the additional cost of green finance projects.

## FINDINGS FOR THE PROJECT LEVEL

### **Strong coordination between stakeholders with a designated lead and clear communication channels.**

Each case study involved several project stakeholders, from the design through to implementation phases. When one stakeholder took the leading role in coordination, the process was more efficient. In most cases, the city government took the lead. For example, in the Cape Town green bond project, the local government had a strong role in coordinating the stakeholders involved in the bond issuance and verification. Internal communication and coordination were led by the city's internal climate change working group and external communication was handled by the bond arranger and the mayor's office. Overall coordination between all actors was led by the Strategic Policy Unit (then part of the Mayor's office).

In Gaziantep, the municipal government took ownership of the deficiencies of the solid waste management in the city given that the existing waste collection services and processing infrastructure were not meeting the increasing demands. The government used its in-house technical expertise to define the key parameters of the project and then engage the funding body, the financial institutions, and development organizations involved in the implementation phase.

The private sector can also take the leading role, as noted in the eco-tourism project in the Galapagos Islands. The developer engaged with the local municipality, communities, and financing institutions to design the resort and take it forward into construction. All these examples emphasize the importance of clear communication channels and strong coordination with relevant stakeholders.

### **Offsetting high upfront transaction costs through innovative implementation mechanisms.**

High upfront transaction costs are one of the biggest barriers to the implementation of climate projects with new and innovative technologies. Identifying opportunities for these to be offset can enhance these projects' competitiveness compared to existing and potentially more carbon-intensive project alternatives.

Investment pooling is one option, where several municipalities/regions can come together to increase the overall value of what would otherwise be a fairly small investment, thus making it more commercially attractive and viable to investors. The Odisha street lighting project exemplifies this, enabling the high transaction costs of the PPP to be significantly reduced.

A related example is that of bulk procurement, which can be used to decrease the unit costs of technology/assets being purchased. In Santiago, the bulk procurement of electric buses spread across several phases, significantly reducing project costs. Whole-life costs were also included in the assessment to consider both investment finance and operational costs.

Both cases also exemplify how projects considering public–private partnership (PPP) as a means of financing and operating a project, separating the risk of ownership, operation, and maintenance can improve the attractiveness to certain private sector investors. In Santiago, the PPP modality separated the ownership, operation, and maintenance of the public vehicle fleet, which attracted a range of stakeholders to support the project; in Odisha, a dedicated special purpose vehicle and setting performance-based indicators and benchmarks against monthly or annual payments supported its success.

Finally, the use of special funds that provide bridge loans (later converted into equity) can be a viable option for supporting projects with high upfront costs. For example, the eco-tourism project in the Galapagos Islands was supported by the Subnational Climate Fund ('SCF'), a blended finance impact fund, that focuses on investing in mid-size climate resilient and low-carbon infrastructure in emerging economies. These investment impacts are assured via Gold Standard impact fund certification.

#### **Using pilot projects to reduce perceived risk and test approaches for scaling up.**

New technologies and innovative solutions are often seen as risky by investors, given the lack of information, potential implementation challenges, and impacts on return on investments. Accordingly, financing projects in cities with a limited track record of attracting private sector finance makes it difficult to progress towards decarbonization and resilience-proofing. City governments that can undertake activities to reduce (perceived) risk are better placed to unlock private sector finance; but for the reasons mentioned above, this is often a challenge and thus requires proactive engagement from the private sector as well.

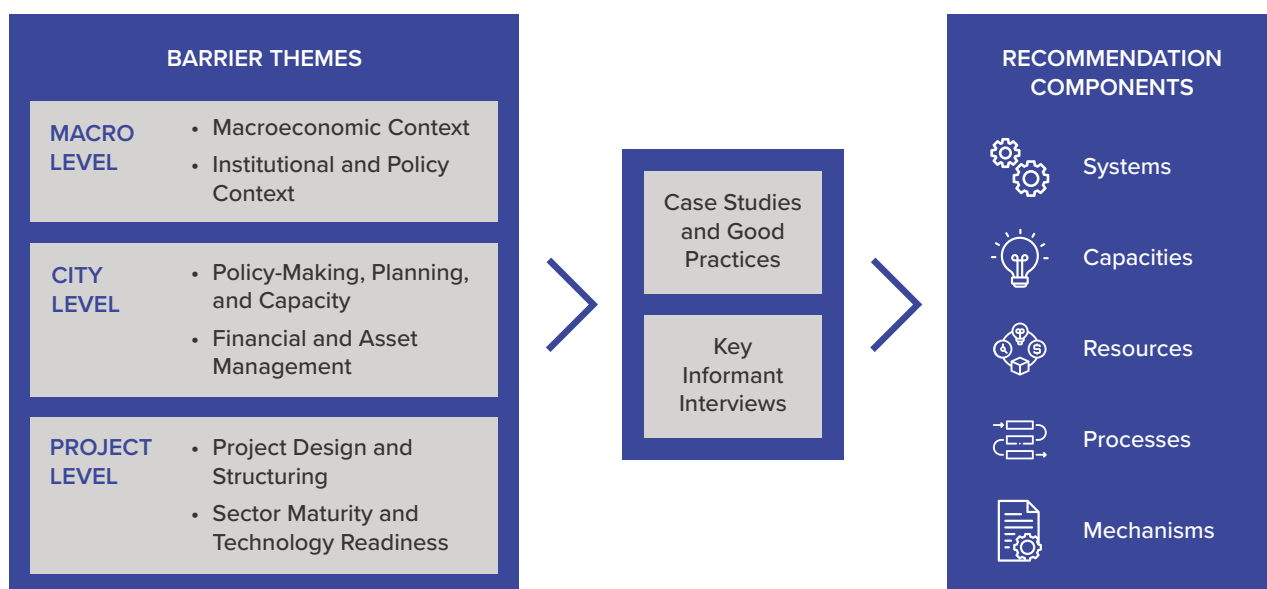
Implementing pilot schemes/projects can provide evidence to investors and financial institutions that certain initiatives are technically and commercially viable, improving investor's confidence in the sector and solution. The successful implementation of a pilot can be used to attract finance for a wider roll-out, as highlighted in the Santiago electric bus transition and Odisha street lighting projects.

Further, enhancing the technical capacity of the local government through the testing of new project implementation approaches and innovative technologies can help build confidence in future projects, as noted in the success of the Gaziantep Mechanical Biological Treatment Facility which attracted international donor support. This project also highlights the importance of engaging grant funding in a first instance to support and overcome the initial barriers and perceived risk for a project in sectors where private sector participation is less obvious given specific local circumstances and wider economic frameworks.

## 4. RECOMMENDATIONS

Responding to barriers to attract more private sector capital to climate investments in cities of emerging economies and learning from case studies and other existing good practices, this chapter presents a set of recommendations to improve local enabling conditions. First, recommendations are presented for city governments, followed by actions that partners in the public, private, and third sector can take. Based on discussions with experts in the field, the recommendations aim to strengthen different components (Figure 3), including (i) systems (the legal, regulatory, and policy environment), (ii) capacities (the skills, experience, and personnel availability), (iii) resources (the financial means, assets, and data), (iv) processes (the steps, practices, and collaboration to plan, develop, and implement climate actions), and (v) mechanisms (the implementation features and instruments to enable bankable climate investments).

Figure 3. Deriving Recommendations for City Governments and Partners



Source: AECOM, 2022.

### 4.1 RECOMMENDATIONS FOR CITY GOVERNMENTS

For city governments in emerging economies, critical barriers to attracting private sector finance are often interlinked with context-specific macroeconomic, political, and economic challenges. These barriers cannot typically be overcome without government intervention at the national and subnational (e.g. state/provincial) levels. As such, the recommendations in this chapter focus on actions that city governments can often take themselves, while chapter 4.2 reflects on the role of city governments' respective public sector partners.

## STRENGTHEN CAPACITIES AND PRACTICES OF FINANCIAL MANAGEMENT

**Achieve cost-effective own-source revenue generation:** Within the existing legal and regulatory framework, city governments should exhaust the instruments at hand to collect revenue, with more emphasis on recurring sources (e.g. taxes, tariffs, leases, and charges) rather than one-off income (e.g. land sales or asset recycling). In this context, land value capture instruments should be reviewed, as they combine the valuable asset land with the option for recurring (or sometimes one-off) local revenue generation.<sup>9</sup> The maximization of own-source revenue instruments can illustrate underutilized or new revenue streams for city governments, allow for better asset valuation, open avenues for collaboration with the private sector (e.g. in PPPs), and provide larger financial buffer to enable additional borrowing and investments.

Barrier Themes:	Recommendation Components:
Financial and Asset Management	Resources

**Streamline financial accounting and assess steps towards obtaining a credit rating:** Notwithstanding national government reporting requirements, city governments can improve their financial accounting practices in alignment with international standards<sup>10</sup> and by compiling relevant statistics of all municipally owned entities (including corporations). This would allow a comprehensive picture on the state of municipal finances, ensure clarity and increased transparency in the sustainable management of liabilities, and provide a necessary foundation towards obtaining a credit rating.<sup>11</sup> Where a city government is likely to be able to obtain a credit rating, it can scope avenues of credit rating municipally-linked enterprises (e.g. infrastructure utilities or public housing corporation) through which private sector collaboration may be enabled in the future. Where obtaining a credit rating is less immediately feasible for city governments or their enterprises, they may obtain a ‘shadow’ credit rating to at least identify their current level of creditworthiness and key areas for improvement.<sup>12</sup> In the Cape Town case study in Chapter 3, strong financial management and transparent reporting illustrated how the city was able to obtain a credit rating as a key to its green bond issuance.

Barrier Themes:	Recommendation Components:
Financial and Asset Management	Systems Capacities

**Expand project finance literacy across departments:** As an accompanying activity for the previous two recommendations, city governments can offer a capacity development

9 OECD and Lincoln Institute of Land Policy. 2022. Global Compendium of Land Value Capture Policies. [https://www.oecd-ilibrary.org/urban-rural-and-regional-development/global-compendium-of-land-value-capture-policies\\_4f9559ee-en](https://www.oecd-ilibrary.org/urban-rural-and-regional-development/global-compendium-of-land-value-capture-policies_4f9559ee-en)

10 IPSASB. 2022. Standards and Pronouncements. <https://www.ipsasb.org/standards-pronouncements>

11 For further reading, Urban-Sustainability-Framework (Global Platform for Sustainable Cities, 2018) section “Enabling dimension 2” provides five steps on how to assess your fiscal sustainability

12 World Bank. 2018. Urban Sustainability Framework. Washington, D.C. <https://documents1.worldbank.org/curated/en/339851517836894370/pdf/123149-Urban-Sustainability-Framework.pdf>

program for their staff to increase understanding of the basic principles of municipal project financing (investments) and funding (operations). These skills are required beyond just the finance department, as conceiving bankable projects best originates from their corresponding technical departments where staff consider how projects could be financed and how they, once commissioned, can be sustainably operated in the long run. A distinct element of such training offer should be the topic of private sector finance and participation in municipal infrastructure and service provision to sensitize staff towards existing or new ways of working with the private sector. Several platforms exist online that provide useful training material to support related activities.<sup>13</sup>

Barrier Themes:	Recommendation Components:
Financial and Asset Management	Capacities

## DEVELOP A STRATEGIC AND COLLABORATIVE APPROACH TO CLIMATE ACTION PLANNING

**Scope impactful climate action sectors with socio-economic co-benefits:** Climate action planning by city governments is best informed by a clear assessment of the primary climate adaptation and mitigation challenges that their citizens, businesses, and environment are exposed to and what opportunities may exist for public or private climate action. Following from such analysis, city governments need to prioritize the challenges and opportunities to avoid spreading limited resources too thinly.<sup>14</sup> This prioritization should be informed by the city government’s wider development strategy and objectives, as climate action receives wider buy-in where it can achieve other co-benefits, for instance towards social inclusion, job creation, or improved infrastructure provision. A key concern for private sector investments in climate actions are track record and scale. City governments should prioritize actions in a few sectors where climate projects are more easily implemented (‘low-hanging fruit’ e.g., more mature sector or lower cost) and replicable (e.g. model interventions<sup>15</sup>). Instead of reinventing the wheel, city governments should use case studies and the experiences of others – choosing attractive financial instruments that have had success elsewhere can give the private sector confidence in investing.

Barrier Themes:	Recommendation Components:
Policymaking, Planning, and Capacity Sector Maturity and Technology Readiness	Processes

<sup>13</sup> See for instance the CCFLA Financial Instruments Toolkit (<https://citiesclimatefinance.org/financial-instruments/>) or the C40 Cities Finance Facility (CFF) knowledge library (<https://www.c40cff.org/knowledge>) or the World Bank’s Municipal Finance training (<https://olc.worldbank.org/facilitated/link/00002900>).

<sup>14</sup> C40. 2022. Climate Action Planning Resource Centre. <https://resourcecentre.c40.org/>

<sup>15</sup> For example, the payback from energy efficiency projects is an attractive investment opportunity. The Malaysian government used PPP with little external support for their innovative ESCO street lighting projects, as piloted in Melaka: Ablaza, Alexander. 2017. Mobilizing Private Capital for Energy Efficiency through PPP Structures. Presentation at the Asia Clean Energy Forum: 8 June. <https://asiacleanenergyforum.adb.org/wp-content/uploads/2017/06/03-Alexander-Ablaza- Mobilizing-Private-Capital-for-EE-through-PPP-Structures-Copy.pdf> .

**Devise city climate action plan interlinked with local spending and national policy priorities:** Following the previous recommendation on assessing and prioritizing challenges and opportunities, a city government can devise a climate action plan. The development of the plan should see the genuine involvement of private sector and other stakeholders to enrich the plan with their ideas, scope early interest in different action areas, and build broad buy-in that may allow the plan to expand beyond the current electoral cycle. The action plan should feature a well-selected list of climate actions and associated sectors. In addition to technical information, the plan should come with financing, ideally interlinking actions with the municipal budgeting process (e.g. through “climate budgeting”<sup>16</sup>) and requiring future spending to clearly align with the plan’s objectives. Where useful and possible, a city government may set up a dedicated fund through which climate actions shall be financed. Additionally, given the importance of national and subnational (state/provincial) governments in many emerging economies, it is essential for city government plans correspond with upper-level government priorities (including Nationally Determined Contributions and other climate targets) and, thereby, make the planned actions eligible for financing support through national or state funds, national development banks (NDBs), line ministry allocations, etc. An example linked to this recommendation can be found in Gaziantep, one of the cities from the case studies presented in the previous chapter. The metropolitan municipality is currently preparing its Green City Action Plan that will aim to attract private sector investment into some of the key projects aimed at addressing the city’s environmental challenges.<sup>17</sup>

Barrier Themes:	Recommendation Components:
Institutional and Policy Context Policymaking, Planning, and Capacity	Systems Resources Processes

**Publish city climate action plan to engage with and invite propositions from private sector and citizens:** City governments should make their climate action plans with investment pipelines publicly available. This can send a clear signal to the private sector, citizens, as well as other partners on how the city government intends to prioritize certain climate action areas and collaborate with actors to realize various investments. An easily accessible plan also allows private sector and citizens to inform themselves on key climate challenges and opportunities in their city. This can increase awareness, improve their decision-making (e.g. for investing in resilience-strengthening measures), and encourage self-action, as is being exemplified by the City of Makati’s climate action planning approach.<sup>18</sup> As part of plan implementation, city governments can seek different engagement formats (e.g. business platforms, townhalls, ‘hackathons’) to follow up with different actors and understand where collaboration opportunities with private sector investment are most likely. Such exchange also allows the private sector to share

16 UNDP. 2021. Budgeting for Climate change. A Guidance Note for Governments to Integrate Climate Change into Budgeting. Bangkok. <https://www.undp.org/publications/budgeting-climate-change-guidance-note-governments-integrate-climate-change-budgeting>

17 EBRD. 2022. Gaziantep Commits to Climate Action as part of EBRD Green Cities. <https://www.ebrdgreencities.com/news-events-and-publications/gaziantep-commits-to-climate-action-as-part-of-brd-green-cities/>

18 The City of Makati is promoting this approach under the motto of ‘self-help, mutual help, public help’, putting citizens and business front and center of local climate action, recognizing that the city government’s resources and capacities are limited in achieving swift progress.

their ideas on how to put climate targets of the city government into practice through specific projects (also see recommendations in the next section).

Barrier Themes:	Recommendation Components:
Polycymaking, Planning, and Capacity	Processes Mechanisms

## PROFESSIONALIZE PROJECT PREPARATION FOR BANKABLE CLIMATE ACTIONS

**Empower capital investment unit for effective project preparation:** A common pitfall happens when detailed technical solutions for climate actions are being devised before a feasible business and financial model are identified. Not dissimilar to traditional project preparation, investments into climate action require upfront attention to their delivery model and related financing and funding mechanisms.<sup>19</sup> City governments can benefit from establishing or empowering an existing unit (e.g. in the finance or planning department) to become the internal and external focal point for collating, scoping, and pipelining climate actions towards project preparation and financial closure. It would help the city government to ‘curate’ a portfolio of climate investments (particularly ‘replicable models’) where private sector and other partners (e.g. international finance institutions) could participate in. Externally, the unit would act as a guiding star for prospective partners and facilitate early engagement between the city government and partners. In doing so, it could better gage the appetite for investment, understand potential hurdles and concerns, and develop a long term dialogue to build trusted partnerships. The unit would also help streamlining a consistent project preparation form (project sheet template) that combines essential information of the government’s established project cycle, as well as key elements commonly inquired by external funders. The importance of the curation of a climate project pipeline has been exemplified by the case study of Cape Town’s green bond issuance presented in Chapter 3.

Barrier Themes:	Recommendation Components:
Project Design and Structuring	Capacities Processes

**Change city government project orientation from ‘hardware’ to ‘services’:** A key rationale for PPP and other forms of private sector participation in government projects, including urban climate actions, is to attract private sector expertise and experience to improve the quality and impact of intended investments. Contrary to this, many governments still follow a very restrictive market approach where large resources are spent during project definition, leading to highly detailed scope of works that are then

<sup>19</sup> See for instance the CCFLA Financial Instruments Toolkit: <https://citiesclimatefinance.org/financial-instruments/>



to be procured from the private sector. However, this approach may result in limited private sector interest (e.g. if they do not agree with the identified proposed ‘solution’ for a project) and leaves little room for the private sector to devise the most suitable approaches or propose possible efficiencies in achieving a project’s outcome. City governments should move away from such ‘hardware’-oriented procurement approaches towards defining instead the ‘services’ that a project is meant to provide to specific stakeholder groups and invite private sector to put forward different ideas.<sup>20</sup> This approach aligns well with performance and impact-based contracting, which is relevant to the often delayed (co-) benefits from climate actions.<sup>21</sup>

Barrier Themes:	Recommendation Components:
Project Design and Structuring Sector Maturity and Technology Readiness	Processes Mechanisms

**Institutionalize climate project capacity and tools throughout city government departments:** The previous two recommendations would establish a more professional approach to climate project preparation with service-oriented market engagement. An additional step would focus on the replicability and expansion of project preparation quality across the city government. This could entail the development of standard procurement documents, model agreements, and related technical, commercial, and legal templates to be applied to similar projects in the future. Once tested and improved upon, the re-use of such forms provide familiarity to both public and private sector actors. The above-mentioned capital investment unit could also prepare short training courses and guidance notes for improved project preparation and finance knowledge to other municipal staff. The secondment of different departmental staff into the unit – or vice versa – could allow for new technical and financial experiences, scale up knowledge sharing, and support other tasks across the project cycle, e.g. if a capital investment unit staff transfers into a project implementation unit (PIU) for a project that they originally helped prepare and structure.

Barrier Themes:	Recommendation Components:
Policymaking, Planning, and Capacity Project Design and Structuring	Capacities Processes

## 4.2 RECOMMENDATIONS FOR PUBLIC SECTOR PARTNERS

Solving the global climate change crisis is a multi-actor and multi-level effort. Therefore, other public sector partners can play a critical role in supporting city governments to

20 World Bank. 2022. Designing PPP Contracts. <https://ppp.worldbank.org/public-private-partnership/designing-ppp-contracts>

21 World Bank. 2017. Resilient Infrastructure Public-Private Partnerships (PPPs): Contracts and Procurement – The Case of Japan. Washington, D.C. <https://ppp.worldbank.org/public-private-partnership/library/resilient-infrastructure-public-private-partnerships-ppps-contracts-and-procurement-case-japan>

create local enabling conditions for private sector climate investments. The partners mentioned in this section have an opportunity to increase and speed up the scale at which climate action can be delivered in cities.

## NATIONAL AND STATE/PROVINCIAL GOVERNMENTS

**Guide lower-level climate action through consistent planning and investment at upper level:** Although it is applaudable to see city governments move ahead and be more ambitious when it comes to climate action, upper-level governments, in particular at the national level, play a major guiding role in setting a clear direction towards achieving climate mitigation and adaptation targets in line with their risk context and international commitments. Related strategies, plans, and policies can signal to investors where the country as a whole intends to move in advancing climate solutions in different, possibly prioritized sectors – this can help to create and expand markets for particularly relevant climate technologies with related private sector potential. The case study of e-buses procurement in Santiago, Chile, where the national government launched an ambitious national electromobility strategy, provides one such example (Chapter 3). Similar to the city government recommendation in the previous section, this planning element needs to be accompanied by committing financial resources to climate actions. This can be done through dedicated state/provincial or national climate funds, which can also be managed through National Development Banks (NDBs) (see recommendations in next section). Those funds can provide different instruments for replicable climate projects available to city governments (of different sizes, not just large urban areas) and private sector entities (e.g. to provide viability gap funding for new technologies).<sup>22</sup> Some governments in emerging economies, such as Senegal, have also established a sovereign private equity company to directly support climate investments within cities.<sup>23</sup>

Barrier Themes:	Recommendation Components:
Institutional and Policy Context Policymaking, Planning, and Capacity Sector Maturity and Technology Readiness	Systems Resources

**Strengthen subnational climate finance and capacity:** Building up on the previous recommendation, it is also important to increase the reliability and transparency around intergovernmental transfers clearly linked to achieving climate objectives as defined in government plans and policies. Through “green budgeting”, governments can interlink policymaking with budgetary allocations and investment decisions towards climate-positive outcome areas.<sup>24</sup> In parallel, increasing fiscal decentralization can encourage city governments to increase their own-source revenue base, as reflected in the recommendation of the previous section. Alongside these financial measures, upper-

22 Schur, Michael. 2016. Public-Private Partnership Funds. Observations from International Experience. ADB East Asia Working Paper Series: 6. <https://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/2022-03/eawp-06.pdf>

23 Floater, Graham, et al. 2017. Global Review of Finance for Sustainable Urban Infrastructure. London and Washington, DC (Coalition for Urban Transitions). <http://newclimateeconomy.report/workingpapers/workingpaper/global-review-of-finance-for-sustainable-urban-infrastructure/>

24 UNDP. 2021. Budgeting for Climate change. A Guidance Note for Governments to Integrate Climate Change into Budgeting. Bangkok.

level governments should extend capacity development to increase city government staff’s understanding of green finance, bankable project preparation, and private sector delivery models.<sup>25</sup> An interesting case is provided by the Philippines’ ongoing evolution of political and fiscal decentralization alongside national and subnational capacity development efforts.<sup>26</sup> India provides a specific example where the national government has developed guidance notes to inform subnational authorities on the steps to take to raise financing from domestic capital markets, with instructions on (i) the preparatory actions to enhance creditworthiness, (ii) the regulatory framework, and (iii) the process of bond issuance.<sup>27</sup>

Barrier Themes:	Recommendation Components:
Institutional and Policy Context Policymaking, Planning, and Capacity Financial and Asset Management	Systems Capacities Resources

**Mainstream standardized green finance instruments and practices:** With the green finance field rapidly evolving, city governments can be supported and private sector confidence can be increased by upper-level government defining standardized financial practices, for instance in public sector financial accounting, for the market entry and design of different financial instruments (e.g. sustainability-linked bonds for both public and private actors<sup>28</sup>), and impact reporting (e.g. annual reports which capture environmental metrics associated with Green Bond issuance).<sup>29</sup>

Barrier Themes:	Recommendation Components:
Institutional and Policy Context Project Design and Structuring	Systems Mechanisms

**Establish green procurement guidelines and bundle up investments:** Green procurement regulations and guidelines can play a key role in creating and expanding the market for climate solutions that attract more private sector participation, both locally and from international investors. While the market size of individual cities may not be very attractive, green procurement at bulk can be a market changer, as illustrated by the publicly owned Convergence Energy Services company in India that procured more

<https://www.undp.org/publications/budgeting-climate-change-guidance-note-governments-integrate-climate-change-budgeting>

25 UNDP. 2020. Empowering Subnational Governments to Improve Budget and Financial Management Performance. Enabling Factors at the National Level. New York. <https://www.unicef.org/media/100251/file/Improving-Budget-Performance.pdf>

26 UNDP. 2022. Decentralization, Digitalization, and Development. Strengthening Local Governance for Crisis Response, Recovery, Resilience, and the Sustainable Development Goals. Mandaluyong. [https://www.undp.org/sites/g/files/zskgke326/files/2022-11/MANDANAS%20Report%202022\\_FINAL%20FINAL%20FILE\\_High%20Quality\\_NOV%2030.pdf](https://www.undp.org/sites/g/files/zskgke326/files/2022-11/MANDANAS%20Report%202022_FINAL%20FINAL%20FILE_High%20Quality_NOV%2030.pdf)

27 Ahmad, E., Dowling, D., Chan, D., Colenbrander, S., Godfrey, N. 2019. Scaling Up Investment for Sustainable Urban Infrastructure: A Guide to National and Subnational Reform. London and Washington, DC (Coalition for Urban Transitions). [https://newclimateeconomy.report/workingpapers/wp-content/uploads/sites/5/2019/04/CUT2019\\_Scaling\\_up\\_investment\\_for\\_sustainable\\_urban\\_infrastructure.pdf](https://newclimateeconomy.report/workingpapers/wp-content/uploads/sites/5/2019/04/CUT2019_Scaling_up_investment_for_sustainable_urban_infrastructure.pdf)

Also see: Ministry of Finance, India. 2017. Guidance on the Use of Municipal Bond Financing for Infrastructure Projects. Delhi. <https://www.pppinindia.gov.in/documents/20181/33749/Guidance+on+use+of+Municipal+Bonds+for+PPP+projects.pdf/037cb143-8305-4c57-8f3c-32e5a329297f>

28 UN ECLAC. 2022. Corporate Governance in Latin America and the Caribbean. Using ESG Debt Instruments to Finance Sustainable Investment Projects. Santiago de Chile. [https://repositorio.cepal.org/bitstream/handle/11362/47778/1/S2200103\\_en.pdf](https://repositorio.cepal.org/bitstream/handle/11362/47778/1/S2200103_en.pdf)

29 IFC. 2022. Emerging Market – Banks, Bonds, and Impact. Green Bond Impact Reporting Practices of Emerging Market Financial Institutions. Washington, D.C. <https://www.environmental-finance.com/assets/files/IFC/emerging-markets-banks-bonds-and-impact-report-2022.pdf>

than 5,000 e-buses for the cities of Bengaluru, Delhi, Hyderabad, Kolkata, and Surat.<sup>30</sup> The public sector at different levels can also be instrumental to create a market for climate solutions by piloting technologies and standards, exemplified by the introduction and roll-out of green building support instruments facilitated by the European Bank for Reconstruction and Development with national and subnational governments and local banks in former Soviet Union countries.<sup>31</sup>

Barrier Themes:	Recommendation Components:
Institutional and Policy Context Project Design and Structuring Sector Maturity and Technology Readiness	Systems Mechanisms

Incentivize low-carbon and de-incentivize high-carbon practices: In governance contexts where tariffs and subsidies are controlled by upper-level government, city governments can be very restricted in their ability to enable more private sector participation in new climate solutions. Therefore, upper-level governments can support starting the market off, e.g. by removing subsidies for particularly high-carbon operations (e.g. Indonesian government’s attempt to phase out of fossil fuel subsidies across cities <sup>32</sup>, or – if that is not politically feasible – by leveling the playing field through reduced tariffs and government grant support to increase user uptake of new climate solutions while enabling cost recovery plus small profit for private sector entities (e.g. grants for energy efficiency projects rolled out across cities in India discussed in the Odisha case study in Chapter 3).

Barrier Themes:	Recommendation Components:
Macroeconomic Context Sector Maturity and Technology Readiness	Systems Mechanisms

**Use upper-level government finance to de-risk urban climate investments:** Private sector is familiar with project delivery profiles where large upfront investments are paid backed with fairly consistent returns over a pre-defined timeframe. As such, public sector taking on large upfront capital investments in climate projects does not make for the most effective approach. Instead, public sector finance, in particular of upper-level governments that can typically carry more risk than city governments, is better used as a safety net in enabling climate investments.<sup>33</sup> Different modalities have been deployed by (national) governments in emerging economies, including, e.g., the provision of sovereign guarantees for subnational PPP projects<sup>34</sup> and aggregation of subnational projects to distribute investment risk (as illustrated by the Odisha case study in Chapter 3).

30 Economic Times. 2022. CESL launches biggest ever tender worth Rs 5,500 cr for 5,580 electric buses. News: 20 January. [https://economictimes.indiatimes.com/industry/renewables/cesl-launches-biggest-ever-tender-worth-rs-5500-cr-for-5580-electric-buses/articleshow/89015132.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](https://economictimes.indiatimes.com/industry/renewables/cesl-launches-biggest-ever-tender-worth-rs-5500-cr-for-5580-electric-buses/articleshow/89015132.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)

31 EBRD. 2018. Green Building Investments. London. [www.ebrd.com/documents/climate-finance/green-building-investments-report.pdf](http://www.ebrd.com/documents/climate-finance/green-building-investments-report.pdf)

32 IISD. 2010. Lessons Learned from Indonesia’s Attempts to Reform Fossil-Fuel Subsidies. Winnipeg. [https://www.iisd.org/system/files/publications/lessons\\_indonesia\\_fossil\\_fuel\\_reform.pdf](https://www.iisd.org/system/files/publications/lessons_indonesia_fossil_fuel_reform.pdf)

33 OECD. 2017. Selected Good Practices for Risk Allocation and Mitigation in Infrastructure in APEC Economies. Paris. <https://www.oecd.org/daf/fin/private-pensions/Selected-Good-Practices-for-Risk-allocation-and-Mitigation-in-Infrastructure-in-APEC-Economies.pdf>

34 EIB. 2010. State Guarantees in PPPs. A Guide to Better Evaluation, Design, Implementation and Management. Luxemburg. <https://www.eib.org/press/2010/01/state-guarantees-in-ppps>

Barrier Themes:	Recommendation Components:
Macroeconomic Context Project Design and Structuring	Resources Mechanisms

## NATIONAL DEVELOPMENT BANKS

### Support city government project preparation units through specialized teams:

Particularly in contexts of limited city government capacity or where city governments are in the process of expanding their project preparation units, National Development Banks (NDBs) can play a useful role in having dedicated teams focused on urban climate solutions. These teams can work directly with city governments, bringing in their own expertise and experience from several different projects and cities to structure projects that are bankable and attract private sector participation – a model that has been tested for instance by Colombia’s Findeter.<sup>35</sup> This role can also entail improved accessibility of city governments to international climate finance through the higher capacity, familiarity, and eligibility of NDBs towards those funds.<sup>36</sup> As part of or accompanying existing NDB structure can be dedicated project preparation facilities targeted at enabling urban climate projects with private sector participation.<sup>37</sup> In the example of the Gaziantep case study in Chapter 3, ILBANK, Turkiye’s NDB, provided technical assistance and acted as a financial intermediary to the municipality to channel the international grant funding.

Barrier Themes:	Recommendation Components:
Project Design and Structuring	Capacities Resources Processes

### Establish corporate climate governance frameworks and procedures to scale climate finance:

Since NDBs are or can be a major actor in subnational climate finance, including with the private sector, it is critical that they upgrade their own internal systems to mainstream climate risk throughout the project cycle towards a corporate climate governance, which can also function as a model to be followed by city governments, municipal corporations, and utility companies.<sup>38</sup> This concerns early project identification, scoping of zero or low carbon solutions, resilience-proofing of investments, application of green procurement approaches (as outlined in the national government recommendation above), and the monitoring of NDB investments in terms of their alignment with NDB-specific or national government climate strategies and targets. Given their size, NDBs are also in a good position to bundle up subnational climate projects to achieve larger ticket sizes and facilitate partnerships of public and private sector, as illustrated by PT Sarana Multi Infrastruktur in Indonesia.<sup>39</sup>

[eib.org/attachments/epec/epec\\_state\\_guarantees\\_in\\_ppps\\_en.pdf](http://eib.org/attachments/epec/epec_state_guarantees_in_ppps_en.pdf)

PPIAF. 2019. Government Guarantees for Mobilizing Private Investment in Infrastructure. Washington, D.C. <https://ppiaf.org/documents/5798/download>

35 CPI. 2021. Leveraging National Development Banks to Enhance Financing for Climate-Smart Urban Infrastructure. London. <https://www.climatepolicyinitiative.org/publication/leveraging-national-development-banks-to-enhance-financing-for-climate-smart-urban-infrastructure/>

36 CCFLA. 2020. Enhancing the Role of National Development Banks in Supporting Climate-Smart Urban Infrastructure. London. <https://citiesclimatefinance.org/publications/enhancing-the-role-of-national-development-banks-in-supporting-climate-smart-urban-infrastructure/>

37 CCFLA. 2022. Project Preparation Resource Directory. <https://citiesclimatefinance.org/project-preparation-resource-directory/>; also see: CCFLA. 2023. Guide for Small and Intermediary Cities on Preparing Bankable Climate Infrastructure Projects. London.

38 For an example approach see: EBRD. 2022. EBRD Corporate Climate Governance Facility. <https://www.ebrd.com/ccg-facility>

39 AFD. 2015. Promoting Renewable Energy and Climate Investments through a Green Credit Line to PT SMI, a Key Public Financial

Barrier Themes:	Recommendation Components:
Policymaking, Planning, and Capacity Project Design and Structuring	Systems Resources Processes Mechanisms

## INTERNATIONAL FINANCE INSTITUTIONS AND CLIMATE FUNDS

### Review and improve financial instruments and support services for city governments:

Although improvements have been achieved, there are still significant barriers for city governments and other subnational actors in accessing international climate finance, either from dedicated funds or from international finance institutions (IFIs).<sup>40</sup> While national governments have to work on legal restrictions around sub-sovereign lending and other financial instruments for city governments, IFIs and funds need to revisit their existing offering to understand if the instruments match the needs for urban climate projects from public and private sector and if the hurdles of eligibility and accessibility are sufficiently low to also enable less capacitated entities to benefit from international climate finance.<sup>41</sup> Where direct financial relationships are not possible, other avenues should be exhausted, such as extended financing support from IFIs to NDBs, who can then use their country-specific expertise and experience to channel climate finance where it is most impactful at the subnational level — be it towards subnational government entities, pooled funds, private sector entities, or for PPPs.

Barrier Themes:	Recommendation Components:
Institutional and Policy Context Project Design and Structuring	Systems Resources Mechanisms

**Focus on additionality and risk mitigation to enable private sector participation in urban climate projects:** It is being debated if IFIs are too conservative in providing finance for key development and crisis response efforts in emerging economies, including climate action.<sup>42</sup> Lower-risk projects are being preferred, often with a nearly exclusive public sector financing approach with concessional rates that leave no space for private sector participation, even though those projects could be particularly possible for private sector finance institutions and investors to play a role in. IFIs need to increase their effectiveness through the “additionality” of their finance, enabling climate projects that otherwise could not be realized, including through risk mitigation instruments instead of traditional public sector lending and grant funding.<sup>43</sup> Key performance

Institution of Indonesia. <https://www.afd.fr/en/carte-des-projets/promoting-renewable-energy-and-climate-investments-through-green-credit-line-pt-smi-key-public-financial-institution-indonesia-0>

40 IIED. 2017. Delivering Real Change: Getting International Climate Finance to the Local Level. London. <https://www.iied.org/sites/default/files/pdfs/migrate/10178IIED.pdf>

41 Alexander, James, Darius Nassiry, Sam Barnard, Michael Lindfield, Renard Teipelke, Martijn Wilder. 2019. Financing the Sustainable Urban Future: Scoping a Green Cities Development Bank. London (ODI). <https://cdn.odi.org/media/documents/12680.pdf>

42 Humphrey, Chris. 2022. ODI Insights: The case for an external review of multilateral development bank capital adequacy. <https://odi.org/en/insights/the-case-for-an-external-review-of-multilateral-development-bank-capital-adequacy/>

43 World Bank. 2022. Guarantee and Risk Insurance Products Provided by International Financial Institutions. Washington, D.C. <https://ppp>.

indicators would accordingly look at the leveraging ratio of international climate finance through blended finance approaches.<sup>44</sup>

Barrier Themes:	Recommendation Components:
Financial and Asset Management Project Design and Structuring	Resources Mechanisms

**Provide climate finance and support to city governments in a programmatic way:** As is apparent from the barriers discussed in Chapter 2, many hurdles that city governments face cannot be easily overcome. Therefore, IFIs through their mandate, capacity, and resourcing have the opportunity to jointly define with city and national governments a programmatic approach to tackle climate risks through longer-term collaboration. This would move IFIs away from a project-by-project approach and recognize the multi- and cross-sectoral nature of the climate challenges and opportunities that many cities in emerging economies face. Such programmatic examples already exist, for instance Asian Development Bank’s Green Cities work with several district and provincial governments in Vietnam.<sup>45</sup> Moving beyond those public sector-focused interventions, public-private delivery models should be scoped and built into collaboration programs from the outset. This then corresponds well with the city government recommendations in Chapter 4.1, where a set of replicable climate project models would be piloted first before additional solutions and sectors are being targeted – in a process of increasing local capacities and market sizes for climate action.

Barrier Themes:	Recommendation Components:
Policymaking, Planning, and Capacity Sector Maturity and Technology Readiness	Capacities Processes

### 4.3 RECOMMENDATIONS FOR PRIVATE AND THIRD SECTOR PARTNERS

The private sector has an important role to play in providing innovative products and services for urban climate action. It is also profitable to do so; companies that are already leading on climate action are realizing above-expected returns across five sources of value.<sup>46</sup> The following recommendations have been organized into financial entities who are critical to providing finance for climate projects (e.g. banks, private equity funds, asset management companies, insurance corporations, and

[worldbank.org/public-private-partnership/financing/risk-mitigation-mechanisms-products/guarantee-and-risk-insurance-ifis/guarantee-and-risk-i](https://www.worldbank.org/public-private-partnership/financing/risk-mitigation-mechanisms-products/guarantee-and-risk-insurance-ifis/guarantee-and-risk-i)

44 Li, Bi, Fabio Natalucci, Prasad Ananthakrishnan. 2022. How Blended Finance Can Support Climate Transition in Emerging and Developing Economies. IMF Blog: 15 November. <https://www.imf.org/en/Blogs/Articles/2022/11/15/how-blended-finance-can-support-climate-transition-in-emerging-and-developing-economies>

45 ADB. 2022. Viet Nam: Secondary Green Cities Development Project. Manila. <https://www.adb.org/projects/47274-003/main>

46 Including financial, social, planetary, employee, and customer value. Source: EY. 2022. Sustainable Value Study. London. [https://info.ey.com/Nordics-Cross-Multiple-GC-2022-11-03-EY-2022-Sustainable-Value-Study\\_01LP.html](https://info.ey.com/Nordics-Cross-Multiple-GC-2022-11-03-EY-2022-Sustainable-Value-Study_01LP.html)

pension funds), non-financial entities who are typically the co-developer, designers, implementers, and operators of climate projects (e.g. infrastructure and private utility companies), and third sector organizations who fulfill a relevant supporting role in advancing and supporting climate action where other actors are not yet sufficiently present or fall short (e.g. non-government organizations and philanthropic funds).

## FINANCIAL ENTITIES

**Shift investment portfolios towards (urban) climate action:** Private sector financial institutions have a long way to go in ‘greening’ their investment portfolios – this is true for traditional banks as it is for private equity investment companies and pension funds. Similar to the corporate climate governance mentioned under the NDBs recommendations, private sector financial institutions should define frameworks, operating principles, and corresponding actions towards climate-positive investments. For banks, this would include tailoring existing debt instruments towards urban climate projects by both public and private sector borrowers. For pension funds, for instance, this could include a two-way action by (i) liaising with governments that influence the regulatory framework within which the pension funds are making their capital allocations, as well as (ii) scoping the market for financial intermediaries that can offer sufficiently large and diversified green (urban) investment portfolios with risk-adjusted returns, into which pension funds can invest in.<sup>47</sup> The increase in climate finance products may also contribute to more competition between private sector financial institutions, allowing for further instrument sophistication and more attractive pricing structures for public and private sector clients alike.

Barrier Themes:	Recommendation Components:
Policymaking, Planning, and Capacity	Resources Mechanisms

**Adjust project risk and return profile expectations:**<sup>48</sup> Although green investments seem to increasingly pay off, the return on investment across different sectors varies significantly and there are some climate action areas – particularly in the field of climate adaptation and resilience projects – where project risk and return profiles will likely remain less attractive than traditional ‘plain vanilla’ high-carbon investments (e.g. gas power plants), unless they become stranded assets due to comprehensive climate policies and sufficient technological efficiency and scale of green infrastructure. If financial institutions are not willing to ‘take a haircut’ on their profits, the availability of climate finance is likely to lag investment needs. Deep green projects, particularly when both public and private sector are involved, often come with more complex project preparation for both technical and commercial features. Private sector financial entities need to be willing and committed to shoulder likely higher upfront project preparation

47 Mutuku, Nzomo. 2018. Time for Pension Funds to Go Green on Projects. Business Daily Africa: 22 October. <https://www.businessdailyafrica.com/bd/opinion-analysis/ideas-debate/time-for-pension-funds-to-go-green-on-projects-2224332>; OECD. 2011. *The Role of Pension Funds in Financing Green Growth Initiatives*. Paris. <https://www.oecd.org/finance/private-pensions/49016671.pdf>

48 IMF. 2021. Investment Funds: Fostering the Transition to a Green Economy. Chapter 3 in: IMF. Global Financial Stability Report. Washington, D.C. <https://www.imf.org/-/media/Files/Publications/GFSR/2021/October/English/ch3.ashx>



and structuring costs, higher management costs e.g. linked to impact monitoring for green bonds, and different profit profiles. The social capital investment sector – although relatively small in size – has illustrated that increased participation of the private sector is possible if the investing entities are specifically tasked to create socially oriented portfolios. A similar strategic direction can be seen in the area of green and climate focused equity funds.<sup>49</sup>

Barrier Themes:	Recommendation Components:
Project Design and Structuring	Mechanisms

**Expand efforts for aggregating climate projects:** Investment funds in the climate space play a key intermediary role in bundling up a number of relatively smaller climate projects to offer larger-scale packages to institutional investors in the market – with a recent example from Southeast Asia being the HSBC and Temasek partnership to catalyze ‘marginally bankable, sustainable infrastructure projects’.<sup>50</sup> Aggregation can happen, e.g., when several climate projects in the same geographic location are bundled together (e.g. Cape Town’s green bond case study in Chapter 3); or when the same/similar project model across various locations are bundled together (e.g. Tamil Nadu’s Pooled Facility for water and sanitation projects).<sup>51</sup> Where such bundling does not catch the interest of private sector financial institutions, it may be with public sector entities (from the national to the city level, e.g. through NDBs) to invest the resources to bundle up the climate projects to seek institutional investors in the capital markets.

Barrier Themes:	Recommendation Components:
Project Design and Structuring	Resources Mechanisms

**Co-invest in public climate fund vehicles:** Instead of setting up their own investment vehicles, private sector financial entities have an additional avenue of using publicly set up climate funds or related vehicles to invest in. Ideally based on an early engagement where the corporate climate governance and key investment principles of such fund are being defined, such blended finance vehicles can allow for contributions from different investors, with correspondingly adjusted risk-return profiles for their shares (e.g. with a participating IFI providing first loss financing and a national government providing guarantees). In such vehicles, private sector financial entities can also provide seconded staff, increasing the delivery capacity of project preparation units and contributing to the learning of government staff in such vehicles. There are currently several pilots ongoing

49 CDP. 2022. CDP Announces 2021 List of Top 20 Funds for Environmental Performance. <https://www.cdp.net/en/articles/media/climetrics-fund-awards-2021>

50 HSBC. 2021. HSBC and Temasek Launch Partnership to Catalyze Sustainable Infrastructure Projects in Asia. News Release: 30 September. <https://www.hsbc.com/news-and-media/media-releases/2021/hsbc-and-temasek-launch-partnership-to-catalyze-sustainable-infrastructure-projects-in-asia>

51 FMDV. 2021. Aggregation Interventions to Increase Urban Climate Finance. <https://fmdv.net/admin/Images/Publications/133/FinalAggregationKnowledgeProduct.January2021.pdf>

in emerging economies, from the regional level (e.g. ASEAN Catalytic Green Finance Facility<sup>52</sup>) down to the subnational level (e.g. Shandong Green Development Fund<sup>53</sup>).

Barrier Themes:	Recommendation Components:
Project Design and Structuring	Capacities Resources

**Expand incentives for climate risk reduction efforts in and through insurance**

**products:** Urban climate projects come with usual project risks – mitigating those will make the projects more attractive to potential investors. Given their beneficial nature and risk-reducing features with regard to climate impacts, as well as other socioeconomic and environmental co-benefits, climate projects should enjoy preferential terms from insurance providers. Those providers could tailor their existing products towards requirements for climate mitigation and resilience-proofing measures in investment projects, as well as offer pooling arrangements that distribute risks and make insurance products more affordable to a group of participating city governments.<sup>54</sup> Still in its early stages, solutions such as Climate Insurance Linked Resilient Infrastructure Financing (CILRIF) are examples of how affordable climate insurance products can be tailored towards city governments with a focus to incentivize local climate action sending market signals that the city is committed to improving its resilience, and, thus, may be eligible for relatively lower-cost finance for its investments. At the same time, the insurance coverage provides a safety buffer to the city government, easing up financial resources that can be accordingly dedicated to other investments.<sup>55</sup>

Barrier Themes:	Recommendation Components:
Project Design and Structuring	Mechanisms

## NON-FINANCIAL ENTITIES

**Be propositional with climate project solutions for city governments:** Scoping, identifying, and designing urban climate solutions is dependent on private sector ideas. It is unrealistic to assume that city governments will come up with all necessary actions and propose the best implementation mechanisms to address local climate challenges and realize opportunities. Private sector entities in infrastructure planning and development, environmental services, data and monitoring, as well as other technological innovations and service areas should regularly engage with public sector counterparts to develop a joint understanding of where the private sector could most

52 ADB. 2022. ASEAN Catalytic Green Finance Facility (ACGF). Manila. <https://www.adb.org/what-we-do/funds/asean-catalytic-green-finance-facility/overview>

53 Lindfield, Michael, Frederic Asseline, Hubert Jenny, Yihong Wang, Anouj Mehta. 2021. Catalyzing Climate Finance. Lessons Learned from the Shandong Green Development Fund. ADB Sustainable Development Working Paper Series: 75. <https://www.adb.org/sites/default/files/publication/691211/sdwp-075-climate-finance-shandong-green-development-fund.pdf>

54 For an example of such pool structure, see: ADB. 2018. Philippine City Disaster Insurance Pool. Rationale and Design. Manila. <https://www.adb.org/publications/philippine-city-disaster-insurance-pool>

55 Climate Finance Lab. 2022. Climate Insurance Linked Resilient Infrastructure Financing (CILRIF). <https://www.climatefinancelab.org/project/climate-insurance-linked-resilient-infrastructure-financing-cilrif/>

effectively play a role in urban climate project delivery – also using vehicles such as the Business Alliance to Scale Climate Solutions and the World Business Council for Sustainable Development.<sup>56</sup> Engagement can also be facilitated if city governments establish dedicated project preparation units as recommended in Chapter 4.1. There is also the other side of project preparation, where private sector entities are better placed to translate technical project ideas to private sector financial entities to gauge their interest while speaking – something that city governments may struggle with. Private sector entities are also well placed to offer skill and capacity sharing with national governments to build trust and boost productive partnerships. An example of this is Unilever: It trained tax inspectors in Colombia, Nigeria, Vietnam, Bangladesh, and Pakistan to help their governments improve revenue streams and open discussions on other regulatory issues such as recycling systems.<sup>57</sup>

Barrier Themes:	Recommendation Components:
Project Design and Structuring	Processes

**Adopt a multi-stakeholder approach to climate solutions:** The multi- and cross-sectoral nature of many climate challenges necessarily requires a multi-stakeholder approach to bring the best expertise and resources together. The Coalition for Disaster Resilient Infrastructure (CDRI) is a global example for bringing together public and private sector actors.<sup>58</sup> Another example is Google’s collaboration with C40 Cities and the municipalities of London, Paris, and Copenhagen to support the decarbonization of their electricity grids.<sup>59</sup> In order to effectively involve local communities, the private sector can also benefit from early collaboration with community-based groups and other non-government organizations (see recommendations in next section). As illustrated by the Galapagos case study in Chapter 3, a more transparent approach to project development and implementation helps ensure local buy-in and increase visibility of the involved organizations’ capabilities, which in turn may provide for replication potential in other locations.

Barrier Themes:	Recommendation Components:
Project Design and Structuring Sector Maturity and Technology Readiness	Capacities Resources Processes

## THIRD SECTOR ORGANIZATIONS

**Prioritize bespoke capacity development services:** There has been much duplication in the space of capacity development for urban climate actions due to an overemphasis on the uniqueness of each city’s context. More recently, there are increasing efforts

56 BASCS. 2022. Scaling Climate Solutions. <https://scalingclimatesolutions.org/>

WBCSD. 2022. Overview. <https://www.wbcd.org/Overview/Our-approach>

57 Polman, Paul, and Andrew Winston. 2021. Net Positive. Harvard Business Review Press.

58 CDRI. 2022. Overview. <https://www.cdri.world/>

59 C40 Press release <https://www.c40.org/news/c40-and-google-launch-24-7-carbon-free-energy/> accessed October 2022

to streamline capacity development towards ‘training menus’ that cover the essential topics – from green finance literacy through to bankable project preparation.<sup>60</sup> Making related learning material available in a variety of languages can expand their reach towards city government staff in different emerging economies. Furthermore, it may be worth investigating what specific capacity needs private sector actors in emerging economies may have to feel more empowered to play their role in advancing urban climate action. In addition to such training services, project preparation facilities, such as the C40 Cities Finance Facility<sup>61</sup>, are also revisiting the model of embedding experts (ideally local experts) within city governments to support in a variety of areas, aligned to the barriers and recommendations outlined in this report.

Barrier Themes:	Recommendation Components:
Policymaking, Planning, and Capacity Project Design and Structuring	Capacities

**Develop knowledge products on good practice and ‘how to’:** City governments are typically much less concerned with overarching frameworks and policymaking, as those tend to be driven by upper-level governments, particularly at the national level. Therefore, when it comes to urban climate action, the focus primarily lies on the questions of ‘where has this been done before?’ and ‘How can we replicate it?’. Non-government organizations, industry associations, and project preparation facilities are well advised to prioritize the development of easily consumable knowledge products that illustrate success stories with replicability potential and guidance notes that provide step-by-step and templated descriptions that city government staff can apply in their work.<sup>62</sup>

Barrier Themes:	Recommendation Components:
Policymaking, Planning, and Capacity Project Design and Structuring Sector Maturity and Technology Readiness	Capacities

**Provide innovation funding and support test-beds:** Illustrated by several existing organizations, facilities, and platforms, urban climate action requires further innovation.<sup>63</sup> Third sector organizations can support this by working on innovative finance instruments, offer support in the conceptualization, design, modeling, and review of approaches, or provide grant funding for applicants from the public and private sector to scope out new technical, commercial, or financial solutions to urban climate action.

60 See for instance: GIZ. 2022. City WORKS digital toolkit. <https://localising-global-agendas.org/>; Resilience Shift. 2020. Resilience Toolbox. <https://www.resilienceshift.org/tools/>

61 C40 CFF. 2022. Apply for Support. <https://www.c40cff.org/apply>

62 See for instance: CCFLA. 2022. Resources. <https://citiesclimatefinance.org/resources/>; CDIA. 2022. Resources: [cdia.asia/resources/](https://cdia.asia/resources/)

63 See for instance: Atlantic Council. 2022. Adrienne Arsht – Rockefeller Foundation Resilience Center. <https://www.atlanticcouncil.org/programs/adrienne-arsht-rockefeller-foundation-resilience-center/>; Resilient Cities Catalyst. 2022. Programs. <https://www.rcc.city/our-programs>; Climate-KIC. 2022. Who We Are. <https://www.climate-kic.org/who-we-are/what-is-climate-kic/>

Barrier Themes:	Recommendation Components:
Project Design and Structuring Sector Maturity and Technology Readiness	Capacities Resources

**Support matchmaking between public and private sector:** For smaller cities in emerging economies it can be particularly hard to ‘advertise’ their climate projects to a wider audience of potential technical partners and investors. Some initiatives, such as the Climate Solutions Partnership<sup>64</sup>, help here in creating a platform where different actors can meet. Match-making activities benefit from the larger number of project ideas and experiences being exchanged. Promising approaches and models can be identified and replicated by other city governments and private sector actors.

Barrier Themes:	Recommendation Components:
Project Design and Structuring Sector Maturity and Technology Readiness	Resources Processes

64 WRI. 2022. Climate Solutions Partnership. <https://www.wri.org/initiatives/climate-solutions-partnership>

## 5. CONCLUSION

This report aims to provide recommendations that will improve local enabling conditions targeting components including (i) systems (legal, regulatory, and policy environment), (ii) capacities (skills, experience, and personnel availability), (iii) resources (financial means, assets, and data), (iv) processes (steps, practices, and collaboration to plan, develop, and implement climate actions), and (v) mechanisms (implementation features and instruments to enable bankable climate investments).

There are many solutions that already exist to mitigate and adapt to climate change, as well as climate investment opportunities to apply these solutions to. The recommendations illustrated with real-life examples demonstrate that there are practical steps city governments and their partners can implement right now to improve local enabling conditions. Only through collaborative working can traditional barriers be overcome in a way that enables a rapid expansion of local climate investments, as well as engaging different actors at different scales to create a multiplier effect – an effect that is required to combat our climate emergency.

# APPENDIX A: CASE STUDIES

This section of the report provides a detailed overview of the five case studies reviewed in the report.

## CASE STUDY 1: REDUCING TRANSACTION COSTS THROUGH BULK GREEN PROCUREMENT OF ELECTRIC BUSES IN SANTIAGO, CHILE

Name of the Intervention	Reducing Transaction Costs Through Bulk Green Procurement of Electric Buses		
<b>Geographic region</b>	Central and South America	<b>Country</b>	Chile
<b>Name of City</b>	Santiago	<b>City Type</b>	Capital city, large city (6.8 million)
<b>Focus Sector</b>	Transport	<b>Timeframe for implementation and current status</b>	Under implementation. 2016 – 2017 – Piloting the first e-bus on the streets of Santiago 2017 – 2018 – First round of procurement 2018 – 2019 – Second round of procurement 2019 – present – Additional procurement
<b>Financing mechanism</b>	Public-private partnership (PPP) with bulk procurement	<b>Financing sources</b>	During the pilot phase, the first e-buses cost around \$450,000; however, the price for a bigger e-bus fleet procured for Santiago was \$300,000 per vehicle.  The value of the overall lease agreement between Metbus and Enel X was \$40 million, which provided 100 e-buses and the charging infrastructure (as well as grid updates in two electro terminals, which were estimated at \$3 million each) for 10 years.  By 2020, a total of 455 e-buses had been procured, with the total investment estimated at \$136.5 million. In March 2021, this figure increased to 776 e-buses, with ambitions to have a fully electric public transportation system in Santiago by 2035.

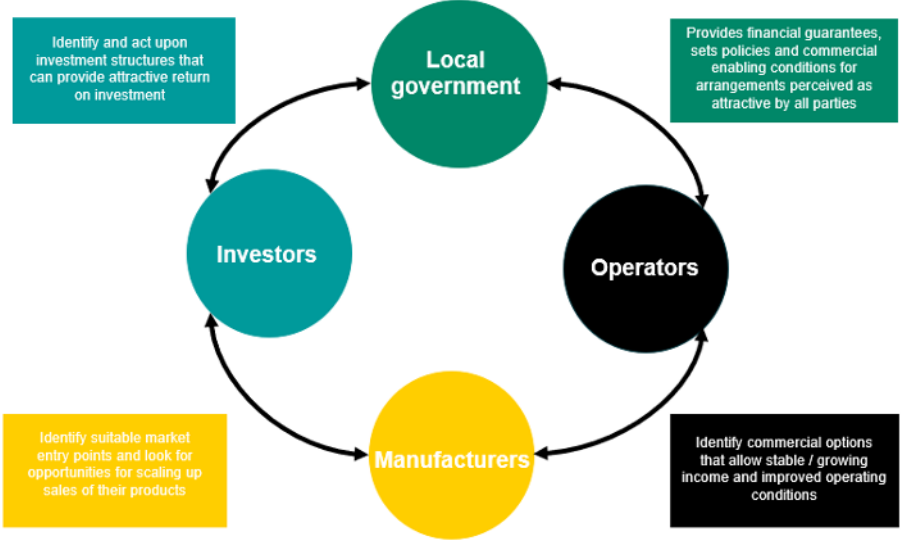
Name of the Intervention	Reducing Transaction Costs Through Bulk Green Procurement of Electric Buses
<p><b>Stakeholders involved</b></p>	<ul style="list-style-type: none"> <li>• <b>Chilean Ministry of Transport and Telecommunications (MTT)</b> – oversees national transport and telecommunications, supervises public and private companies that operate the means of transport in the country, coordinates and promotes the development of these activities, and monitors compliance with relevant laws, regulations, and standards. MTT played an important role in setting the vision for the country’s transport sector, including through the establishment of a country-wide target for the electrification of public transport. In 2017, Chile launched its ambitious national electromobility strategy which was crucial for setting the scene for this project.</li> <li>• <b>Municipality of Santiago (MoS)</b> – Santiago’s local authority that provided support for scaling up the piloting of e-buses. In the early stages of the project, MoS worked with Enel X to decrease incidences of fare evasion (subsequently estimated to have decreased substantially).<sup>65</sup></li> <li>• <b>Metbus</b> – the largest of the six privately-owned public transit operators in Santiago, responsible for operating 25% of the public transport system in the city with a fleet of 436 e-buses. Metbus was the first bus operator to obtain a lease for e-buses with Enel X, in which its role was to operate and maintain the e-buses.</li> <li>• <b>Buses Vule</b> – one of the six privately-owned public transit operators in Santiago, with a fleet that includes 78 e-buses.</li> <li>• <b>Servicio de Transporte de Personas SA (STP)</b> – one of the six public transit operators in Santiago. It has a vehicle fleet that includes 242 e-buses.</li> <li>• <b>Enel X</b> – a subsidiary of an Italian utility company that financed new e-buses for Metbus and provided energy supply and charging for their deployment.</li> <li>• <b>Engie Energia Chile</b> – a subsidiary of a French energy utility company that financed new e-buses for Buses Vule and STP and provided energy supply and charging infrastructure for their deployment.</li> <li>• <b>BYD Co Ltd</b> – publicly listed Chinese conglomerate manufacturing company known for its wide range of electric vehicles.</li> <li>• <b>Zhengzhou Yutong Bus Ltd</b> – a large Chinese manufacturer of commercial vehicles, known for its electric buses.</li> </ul>
<p><b>Barriers encountered</b></p>	<ul style="list-style-type: none"> <li>• Lack of charging infrastructure for electric vehicles</li> <li>• High upfront costs (2x higher than diesel buses at that time)</li> <li>• Lack of previous large-scale deployment of electric buses in the country meant there was a (perceived) high risk for investors</li> <li>• High rate of fare evasion meant (perceived) high risk for investors in obtaining returns on investment</li> <li>• Insufficient regulatory/financial incentive for bus operators to shift to e-buses</li> </ul>

<sup>65</sup> It should be noted that this estimate has been obtained from the literature reviewed but has not been confirmed, and that there are some conflicting sources indicating that fare evasion barely decreased at all.



Name of the Intervention	Reducing Transaction Costs Through Bulk Green Procurement of Electric Buses
<p><b>Summary of the intervention</b></p>	<div data-bbox="539 215 1206 629" data-label="Image"> </div> <p data-bbox="715 640 986 663">Photo credit: Marcela Castilo</p> <p data-bbox="328 696 1445 898">Santiago’s public transit system (known as Transantiago until March 2019) has faced significant challenges over the past few decades, many of which are commonly found in cities worldwide. Some of the challenges included ill-designed procurement schemes that provided little or no incentive to bus owners to improve the quality of services and vehicles, and, as a consequence, an outdated vehicle fleet that could not meet the growing demand. The public transport system was inefficient and suffered from a high rate of fare evasion. The outdated vehicle fleet was an environmental hazard, generating significant amounts of greenhouse gas emissions and air pollutants, with corresponding risks to public health.</p> <p data-bbox="328 920 1445 1061">In 2016, the Municipality of Santiago partnered with Enel X to install bus stops at selected routes that would require passengers to pay the bus fare before boarding, in an attempt to decrease the almost 30% fare evasion rate. The initiative was part of a larger effort to reconstruct and rebrand Santiago’s troubled public transit system – renamed as Red Metropolitana de Movilidad, that consisted of 380 routes operated by 6 private operators, and a vehicle fleet consisting of 6,756 buses.</p> <p data-bbox="328 1084 1445 1225">However, at this point, neither regulatory nor financial incentives were in place that would enable the rapid purchase of a substantial number of e-buses. To reduce the perceived risk and assess the investment viability of e-buses (given their comparatively high cost to diesel buses), Enel X launched a pilot scheme, purchased two e-buses from a Chinese manufacturer, BYD Co Ltd, and leased them to one of the city’s largest public transit operators, Metbus.</p> <p data-bbox="328 1247 1445 1449">Some of the early calculations showed that despite high upfront costs, operating costs of e-buses compared to regular diesel buses were substantially lower (\$0.10/km compared to \$0.35/km) and that the procurement of e-buses makes sense if costs over the total lifecycle of investment are considered. This is mainly down to the significantly lower operating costs of e-buses compared to diesel buses – with almost identical or even superior reliability, and far better environmental impact. In addition to lower operating costs, maintenance costs are estimated to be 66% lower for e-buses than diesel buses, and forecasts indicate that with increased global uptake, the prices of e-buses are likely to further decrease over time.</p> <p data-bbox="328 1471 1445 1576">After the successful pilot scheme, Metbus and Enel X signed a 10-year lease valued at \$40 million that included a lease for 100 electric buses and charging infrastructure, as well as necessary grid updates in the two electro terminals. At the end of the contract, the assets would be transferred to the lessee (in this case, Metbus).</p>

Name of the Intervention	Reducing Transaction Costs Through Bulk Green Procurement of Electric Buses
<p><b>Summary of the intervention</b></p>	<p>In the contract,</p> <ul style="list-style-type: none"> <li>• Enel X acts as financier and energy provider – with an agreement to provide certified renewable energy at a 40% discount (at 0.06 per kW);</li> <li>• Metbus operates the vehicles and provides maintenance, and</li> <li>• The manufacturer, BYD, is responsible for strategic maintenance operations including battery packs, for which Metbus obtained a fixed maintenance rate.</li> </ul> <p>Additional e-buses were then procured via similar partnerships between other energy utility companies – such as Engie Energia Chile and private bus operators Buses Vule and STP, and Zhengzhou Yutong Bus Ltd. Over the years, this has resulted in Santiago having the largest public transport e-vehicle fleet outside of China, and by far the largest in Latin America.</p> <p>It is worth noting that while the support from public authorities was in place, before initial e-buses deployment, there were no contractual incentives for bus operators to use e-buses instead of regular diesel-powered ones. The successful pilot inspired a shift to a new model, whereby current tenders state that fleet suppliers can obtain contracts for 10 years for vehicles with internal combustion engines, whereas for electric buses, the contracts are for 14 years. Operators, who lease buses from suppliers, are given a 5-year contract dependent on their performance. The MoS also established a target of fully electrifying its public transport vehicle fleet by 2035 (broadly aligned with the national target that seeks to do the same by 2040) to provide further encouragement for e-bus procurement. Electromobility represents an important part of the national transportation strategy, led by the Chilean Ministry of Transport and Communications, and Santiago was key in ground-truthing this strategy.</p> <p>In summary, implementation took place in a phased approach, delivered across several years. During this time:</p> <ul style="list-style-type: none"> <li>• Municipality provided support to ensure the return on investment for operators and investors through actions taken to reduce fare evasion.</li> <li>• Bus operators relied on financial and operational leasing mechanisms to reduce transaction costs.</li> <li>• Energy suppliers financed the provision of e-buses and charging infrastructure to build demand for electricity supply from transport, and</li> <li>• Bus manufacturers agreed to reduce the prices to break into the market and for bulk procurement.</li> </ul>
<p><b>Local enabling framework</b></p>	<ul style="list-style-type: none"> <li>• PPP modality separating ownership, operation, and maintenance of bus fleet, which reduced transaction costs.</li> <li>• Successful piloting scheme aimed at improving investors’ confidence;</li> <li>• Local authority’s commitment to building investors’ confidence by dramatically reducing fare evasion and addressing key deficiencies of the public transit system in Santiago;</li> <li>• Evidence of both national and local policy (and targets) aimed at electrifying public vehicle fleets; and</li> <li>• PPP modality with beneficial contractual terms for e-buses [that has subsequently been brought in by MoS].</li> </ul>
<p><b>Key lessons learned</b></p>	<ul style="list-style-type: none"> <li>• Green bulk procurement spread across several phases can significantly reduce transaction costs, especially for investments where the upfront cost is high;</li> <li>• It is important for local authorities to proactively create (even at a small scale) opportunities that would encourage uptake of technologies that could otherwise be perceived as risky – in this case by reducing fare evasion rates;</li> <li>• Contractual modalities that separate ownership, operation, and maintenance of public services can work well in some circumstances (e.g. private sector owns and leases assets to operators, who need to comply with performance indicators set by local government);</li> <li>• In addition to incentives, strong regulation is important to manage competing interests and counter negative by-incentives (e.g. the previous lack of incentives to renew the vehicle fleet).</li> </ul>
<p><b>Pre-requisite tasks need</b></p>	<ul style="list-style-type: none"> <li>• Suitable regulatory environment;</li> <li>• Replicable modality separating ownership/operations and maintenance of assets; and</li> <li>• Pilot scheme to reduce the perceived risks.</li> </ul>

Name of the Intervention	Reducing Transaction Costs Through Bulk Green Procurement of Electric Buses
<p><b>Additional information</b></p>	<p>The following infographic breaks down the role and key considerations of each involved stakeholder in this case study, intending to inform similar processes of creating enabling conditions for private sector investors.</p>  <p>Source: AECOM. 2022.</p>
<p><b>Sources of information</b></p>	<ul style="list-style-type: none"> <li>World Bank. 2020. Latin America Clean Bus in LAC: Lessons from Chile’s Experience with E-Mobility. Washington. <a href="https://documents1.worldbank.org/curated/en/656661600060762104/pdf/Lessons-from-Chile-s-Experience-with-E-mobility-The-Integration-of-E-Buses-in-Santiago.pdf">https://documents1.worldbank.org/curated/en/656661600060762104/pdf/Lessons-from-Chile-s-Experience-with-E-mobility-The-Integration-of-E-Buses-in-Santiago.pdf</a></li> <li>World Bank, UNDP, and Global Infrastructure Facility. 2020. Catalyzing Private Sector Investment in Climate Smart Cities. Washington. <a href="https://documents1.worldbank.org/curated/en/179101596519553908/pdf/Catalyzing-Private-Sector-Investment-in-Climate-Smart-Cities.pdf">https://documents1.worldbank.org/curated/en/179101596519553908/pdf/Catalyzing-Private-Sector-Investment-in-Climate-Smart-Cities.pdf</a></li> <li>World Bank. 2021. Latin America Can Inspire Electric Buses Adoption Worldwide. Washington. Available at: <a href="https://www.worldbank.org/en/news/feature/2021/03/23/uso-de-buses-electricos-marcha-sobre-ruedas-en-latinoamerica">https://www.worldbank.org/en/news/feature/2021/03/23/uso-de-buses-electricos-marcha-sobre-ruedas-en-latinoamerica</a></li> <li>C40. 2020. From Pilots to Scale: Lessons from Electric Bus Deployments in Santiago de Chile. <a href="https://iea.blob.core.windows.net/assets/db408b53-276c-47d6-8b05-52e53b1208e1/e-bus-case-study-Santiago-From-pilots-to-scale-Zebra-paper.pdf">https://iea.blob.core.windows.net/assets/db408b53-276c-47d6-8b05-52e53b1208e1/e-bus-case-study-Santiago-From-pilots-to-scale-Zebra-paper.pdf</a></li> <li>C40. 2020. Accelerating a Market Transition in Latin America: New Business Models for Electric Bus Deployment. Available at: <a href="https://www.c40knowledgehub.org/s/article/Accelerating-a-market-transition-in-Latin-America-New-business-models-for-electric-bus-deployment?language=en_US">https://www.c40knowledgehub.org/s/article/Accelerating-a-market-transition-in-Latin-America-New-business-models-for-electric-bus-deployment?language=en_US</a></li> </ul>

## CASE STUDY 2: PROMOTING ECO-TOURISM VIA EQUITY INVESTMENT IN SAN CRISTOBAL ISLAND, ECUADOR

Name of the Intervention	Promoting sustainable eco-tourism in Galapagos via equity investment		
<b>Geographic region</b>	Central and South America	<b>Country</b>	Ecuador (Galapagos Islands)
<b>Name of City</b>	San Cristóbal Island	<b>City Type</b>	Costal (rural location); small city (5,400 residents)
<b>Focus Sector</b>	Buildings Waste and water management Adaptation/resilience	<b>Timeframe for implementation and current status</b>	Planning stage. Pre-development phase (Detailed Studies, Consultations, Planning) – 2021-2023 Construction – 2023-2025 (planned)
<b>Financing mechanism</b>	Bridge loan converted into equity investment	<b>Financing sources</b>	To date, the project has received USD 8.7 million from the Subnational Climate Fund in the form of a bridge loan <sup>66</sup> . This has supported the pre-development phase activities.  The total project loan is expected to be approximately USD 55 million.  This will be converted into equity during the construction phase.
<b>Stakeholders involved</b>	<ul style="list-style-type: none"> <li>• <b>Orgal S.A.:</b> Project sponsor, developer, and a wholly Ecuadorian-owned private organization whose mission is to secure functional and healthy ecosystems in the islands of Galapagos, and to instill in their inhabitants a sense of responsibility toward the conservation of their natural resources. Orgal S.A is providing the land as an in-kind contribution to the project.</li> <li>• <b>Subnational Climate Fund (SCF):</b> Impact investing fund managed by Pegasus Capital Advisors and capital partner to the developer. SCF is a blended finance fund anchored by the Green Climate Fund and focused on low-carbon and climate-resilient infrastructure projects at the subnational level.</li> <li>• <b>Six Senses:</b> Hotel operator of the eco-resort, recognized as the hospitality industry’s pioneer of sustainable practices.</li> <li>• <b>Galápagos National Park Service:</b> Public agency in charge of the management of the conservation and resources of the national park and marine reserve on the island. They offered to provide guidance and expertise on eradicating invasive species and re-planting the Miconia species.</li> <li>• <b>Governing Council of Galápagos:</b> Governing entity of Galapagos that ensures alignment with local policy makers to understand priorities and increase chances of success (and reduce private sector investment risk).</li> <li>• <b>Local communities:</b> Numerous consultations with local communities which are affected by the project either directly (mostly rural communities of farmers that work in agricultural production) or indirectly (tourism operators, etc.) were held to ensure inclusiveness and integration within the local economy.</li> <li>• <b>Gold Standard:</b> A not-for-profit organization that sets climate mitigation and adaptation standard to ensure reliable validation and certification of the project’s impacts.</li> </ul>		
<b>Barriers encountered</b>	<ul style="list-style-type: none"> <li>• Lack of permissions for investment in the construction of new hotels coupled with a lack of debt financing (local banks do not have sufficient exposure to ecotourism, or the liquidity to support such projects post-COVID) has prevented commercial investors from investing in the Galapagos Islands.</li> <li>• Political pushback on developments (including eco-design/build) in the area, for example, there is a moratorium on new hotel permits.</li> <li>• Lengthy stakeholder engagement process – the project developer undertook seven years of engagement with the local municipality and community groups to secure confidence and buy-in for the project.</li> </ul>		

<sup>66</sup> Bridge loan is a type of short-term loan, usually taken while the longer-term financing is pending.

Name of the Intervention	Promoting sustainable eco-tourism in Galapagos via equity investment
<p><b>Summary of the intervention</b></p>	<div style="display: flex; justify-content: space-around;">   </div> <p>Whilst the Galapagos Islands have a unique biological diversity that needs protection, tourism is critical to the region’s development. The Galapagos Islands face strained public services, inadequate infrastructure, and environmental challenges (including an increasing proportion of invasive species) and are highly vulnerable to climate change impacts. Consequently, an ambitious paradigm shift towards low-impact and climate-resilient tourism development is needed to implement a multisectoral and cross-cutting climate action program to catalyze nature-based ecotourism in the Galapagos archipelago.</p> <p>This project set out to build a LEED-certified<sup>67</sup> eco-resort complex. It is deploying low-impact construction techniques and materials, renewable energy, energy efficiency measures, passive design, and water conservation measures. The project will reduce the number of materials needed by 50% compared to traditional design and implementation.</p> <p>Tourism on Galapagos represents an important branch of the economy (more than 50% of income and nearly 50% of jobs). Nonetheless, the development of tourist infrastructure in the Galapagos is largely opposed by the local municipality (a moratorium on new hotel permits has been put in place) as there is a concern that development could be damaging to the delicate ecosystem of the Galapagos.</p> <p>The eco-resort set out to reset this cycle and chart a new course for high-quality, positive-impact tourism. With this in mind, the project focused on the following impact themes to demonstrate what could be achieved:</p> <ul style="list-style-type: none"> <li>• <b>Local employment with gender equity</b> – there are few job opportunities on the islands other than tourism and those that did exist are not typically occupied by women. The eco-resort has committed to 50% of the job openings being filled by women. To support this, the resort will be opening a day care center to support women on the island access employment and generating their income revenues.</li> <li>• <b>Eradication of invasive species and introduction of native species on the project site</b> – landscaping is focused on creating a systematic and phased eradication of all exotic invasive species that are currently present in the site (such as Guayaba and Blackberry), followed by the planting of the native Miconia species.</li> <li>• <b>Water provision</b> – as part of the project design, an aqueduct system is being constructed to provide water to the resort. This will also provide water to 90 small farms in the resort’s vicinity.</li> <li>• <b>Water Management</b> – high-efficiency water use is implemented on site as are water access interventions (rainwater harvesting and storage).</li> <li>• <b>Sustainable sourcing of produce by collaborating with local farmers</b> – the project works with the farmers and trains them on sustainable agricultural practices, improved planification, and post-harvest processing activities, and connects farmers to markets to improve livelihoods. These efforts will also assist in reducing dependence on importing food from the mainland.</li> <li>• <b>Emissions reduction of up to 50%</b> – the main planning philosophy of the eco-resort is to create a sustainable destination that includes low-impact accommodations and related hospitality facilities based on a thorough energy, waste, and water management system that ensures environmental-friendly and efficient use of resources that is expected to halve emissions compared to an equivalent hotel.</li> </ul>

67 LEED (Leadership in Energy and Environmental Design) – is a building certification program run under the US Green Building Council.

Name of the Intervention	Promoting sustainable eco-tourism in Galapagos via equity investment
<p><b>Summary of the intervention</b></p>	<p>The eco-resort also aims to demonstrate how this type of ecotourism can contribute to the protection and restoration of the island. Local efforts to protect and restore ecosystems, prevent the introduction of invasive species, and bolster the economy through ecotourism will help guide a new region-wide approach. The project aims to change carbon-intensive tourism development and unsustainable consumption and production patterns to increase ecosystem resilience. Sustainable hotel management further enables environmental and climate resilience and integrates local economies to generate economic benefits and social inclusion of communities and island inhabitants, while enhancing traveler experience and resident well-being.</p> <p>In terms of demonstrating resilience, the project will pioneer a new certification approach to climate adaptation. This will ensure that climate risks are anticipated, planned for, and mitigated in advance by the project in consultation with adaptation and climate change experts and local representatives.</p> <p>One of the assessments undertaken in the pre-development phase to inform the design of the resort was an adaptation and resilience survey (assessing how future climate change was going to impact the island, as well as infrastructure). The findings from this assessment were shared with the local municipal government to support wider-scale climate resilience.</p>
<p><b>Local enabling framework</b></p>	<ul style="list-style-type: none"> <li>• The project is aligned with the priorities of the Governing Council of Galapagos and works in cooperation with local institutions like the National Parks Service, as well as the local communities. Active on-the-ground engagement, led by an experienced and knowledgeable project team, to feed into the design of the resort was instrumental to its success. Private investment without this relationship would be significantly riskier and uncertain.</li> <li>• The Green Climate Fund’s concessional financing (first loss tranche) with an early first close. SCF was able to support the project with development funding early on and secure equity rights.</li> <li>• As tourism is typically a US-dollarized industry, the foreign exchange risks are lower compared to other project types which helped the project to comply with SCF’s commercial criteria. This enabled access to SCF’s Technical Assistance support, which was used to conduct additional social and environmental impact studies to support the investment and impact thesis of this project.</li> </ul>
<p><b>Key lessons learned</b></p>	<ul style="list-style-type: none"> <li>• Working with partners that are familiar with the regulatory framework and cultural context was critical to understand local challenges and opportunities;</li> <li>• Local partnerships and detailed consultations with the local community proved integral to the success of this initiative to understand the operating environment and opportunities to create inclusive impact;</li> <li>• Engagement with local partners who have the license to operate in the project’s local environment is key;</li> <li>• Identifying a project that has a strong commercial return profile combined with strong environmental and social benefits supported access to finance through the Subnational Climate Fund.</li> </ul>
<p><b>Pre-requisite tasks need</b></p>	<ul style="list-style-type: none"> <li>• Detailed consultations with local beneficiaries and stakeholders;</li> <li>• Building partnerships with local organizations such as the National Park Service to successfully integrate conservation efforts that are aligned with local priorities;</li> <li>• Close alignment with local policy makers, achieved by consistent interaction;</li> <li>• Integrating social and environmental considerations throughout the full investment cycle (from design to construction to operating phase); and</li> <li>• Consulting with subject matter experts and managing close coordination.</li> </ul>
<p><b>Additional information</b></p>	<ul style="list-style-type: none"> <li>• The Subnational Climate Fund is a blended finance impact fund, anchored by a \$150m investment (first loss tranche) from the Green Climate Fund, and has a strategy to focus on investing in mid-size climate resilient and low carbon infrastructure in emerging economies. The target size of the fund is \$750m.</li> <li>• Investment impacts are assured via Gold Standard impact fund certification.</li> <li>• SCF also features a dedicated, grant-funded facility (\$28m) for Technical Assistance (TA) that supports stakeholders in identifying and strengthening investment proposals for the Fund. In addition to financial performance, it supports implementers in ensuring the achievement of National Determined Contributions (NDCs), Sustainable Development Goals (SDGs) impact, and Nature-based Solutions (NbS).</li> </ul>
<p><b>Sources of information</b></p>	<p>Information provided by: Sub National Climate Fund, Gold Standard, and Pegasus Capital Advisors.</p> <p>For more information please visit: <a href="https://www.pcalp.com/investments/">https://www.pcalp.com/investments/</a></p>

## CASE STUDY 3: OVERCOMING FINANCING BARRIERS FOR PUBLIC STREET LIGHTING THROUGH PPPs IN ODISHA STATE, INDIA

Name of the Intervention	Overcoming Financing Barriers for Public Street Lighting through PPPs		
Geographic region	South Asia	Country	India
Name of City	Bhubaneswar, Berhampur, Cuttack, Rourkela, and Sambalpur (Odisha State)	City Type	Medium-sized cities (Bhubaneswar – 1.3 million, Berhampur – 0.4 million, Cuttack – 0.6 million, Rourkela – 0.5 million, Sambalpur – 0.3 million)
Focus Sector	Urban sustainable energy solutions Transport, buildings	Timeframe for implementation and current status	Completed. Extension to other urban areas under progress. 2016 – 2022
Financing mechanism	Project finance, Public Private Partnership (PPP)	Financing sources	90% capital subsidy from the state government and 10% of private sector investment (equity, equating to approximately USD5 million).
Stakeholders involved	<ul style="list-style-type: none"> <li>• <b>Housing and Urban Development Department (HUDD) of the Government of Odisha</b> – state department for urban planning, responsible for ensuring planned growth of cities and towns and availability of adequate infrastructure, amenities, and services. HUDD selected local authorities for the pilot project and acted as a contracting authority on their behalf.</li> <li>• <b>Odisha Infrastructure Development Fund (OIDF)</b> – a trust fund established to develop and finance infrastructure projects undertaken by local governments. It provided financial assistance that constituted the initial capital subsidy for the PPP.</li> <li>• <b>International Finance Corporation (IFC)</b> – an international financial institution offering investment, advisory, and asset management services to support private sector investment. IFC provided technical support for structuring an effective PPP for this project.</li> <li>• <b>Municipal Corporations<sup>68</sup> of Bhubaneswar, Berhampur, Cuttack, Rourkela, and Sambalpur</b> – local governments of urban areas where street lighting projects were implemented.</li> <li>• <b>Novalume A/S</b> – Danish-owned smart city lighting company working on innovative smart public lighting solutions selected for the PPP in a competitive tender.</li> <li>• <b>Neev Energy</b> – Indian company specializing in energy-efficient, smart public lighting selected for the PPP in a competitive tender.</li> <li>• <b>Energy Efficiency Services Ltd. (EESL)</b> – special company established and promoted by Indian Ministry of Power as a joint venture of four public sector companies: NTPC Ltd, Power Finance Corporation Ltd, REC Ltd. and Powergrid Corporation of India Ltd. EESL provided advice and support to HUDD on project development, was an equity shareholder in the project SPV, and played a role in the payment guarantee mechanism designed for the project.</li> </ul>		
Barriers encountered	<ul style="list-style-type: none"> <li>• High upfront costs for new streetlight technology;</li> <li>• Limited access to external financing for street lighting upgrades at the municipal level; and</li> <li>• Lack of technical knowledge on structuring, negotiating, and implementing effective PPPs.</li> </ul>		

<sup>68</sup> Municipal corporation is a local government type in India in charge of administering urban areas.

Name of the Intervention	Overcoming Financing Barriers for Public Street Lighting through PPPs
<p><b>Summary of the intervention</b></p>	<div data-bbox="584 210 1182 528" data-label="Image"> </div> <p data-bbox="788 539 943 562">Photo credit: IFC</p> <p data-bbox="347 595 1422 701">Across Odisha, multiple local governments are facing a considerable infrastructure deficit. The old, inefficient street lighting is deemed to be a particular problem: unreliable, patchy, or non-existent, and expensive to run and maintain. The lack of public lighting, especially in crime-prone areas, can contribute to the perception of unsafety, especially for vulnerable groups.</p> <p data-bbox="347 719 1437 824">Although robust evidence has emerged that retrofitting and upgrading public lighting can result in significant energy savings (and a significant reduction in CO2 emissions) and that on the balance, it is very cost-effective, many local governments struggle to finance the shift to more energy-efficient lamps from their own sources and are often constrained by high upfront costs.</p> <p data-bbox="347 842 1410 947">To overcome these barriers, in 2016, the HUDD of Odisha sought support from the International Finance Corporation (IFC) to help structure and negotiate an effective PPP for public street lighting that could be piloted with selected municipal corporations across Odisha (Bhubaneswar, Berhampur, Cuttack, Rourkela, and Sambalpur).</p> <p data-bbox="347 965 1394 1070">The pilot sought to install around 40,000 energy-efficient streetlights across the five urban areas and improve service provision through a new control center based on remote operation, real-time monitoring, and predictive repair. In addition to installing new streetlights, the pilot project aimed to improve the existing infrastructure.</p> <p data-bbox="347 1088 1430 1373">The project was financed through a PPP model under an 8-year agreement<sup>69</sup>, under which selected service providers (Novalume A.S and Neev Energy) committed to creating a special purpose vehicle (SPV) that would be entitled to a 90% capital subsidy of the project cost (this subsidy ultimately came from the Odisha Infrastructure Development Fund). The remaining 10% would be covered, in form of equity, by service providers, equivalent to USD 5 million. It was also agreed that the project SPV would be entitled to an annuity payment for the operation and maintenance for 7 years (which was only to be paid upon verification of previously agreed performance indicators<sup>70</sup>). EESL was identified as a suitable entity to implement the project with private sector partners and was entitled to a 26% equity stake through the SPV. Moreover, under the terms suggested, if the government was to fail to make payments to the SPV within the time period specified in the contract, EESL would be required to make such payments (as guarantor) and ensure timely payment.</p> <p data-bbox="347 1391 1445 1608">An important advantage of this financing mechanism is that, through a dedicated SPV, local governments can leverage private capital and carry out the implementation outside the municipality's balance sheet and can thus isolate the project risks within the SPV. Moreover, if private sector providers fail to deliver the services specified in the contract, payments could be deducted or withheld. A drawback of this approach, however, is that typically the preparation and implementation of a SPV comes with high transaction costs; in this case, they were reduced as the HUDD acted as a supervisory entity that was able to bring together several local authorities under a single contract, thus increasing the project scale and lowering the related transaction costs.</p> <p data-bbox="347 1626 1430 1861">Important factors contributing to the success of the pilot project were the national and state-level provisions relating to energy efficiency, and the relatively straightforward, fast, and transparent bidding process. Given the success of this pilot project, the HUDD is planning to replicate the program in 113 other urban municipalities – although not under the same implementation framework. The reason provided was that in most of the smaller urban municipalities, the street light points are not metered and hence the electricity bills are substantially lower than what they would have been if they had to be paid based on the actual energy consumption. In the case of such cities, a preferred approach has been retrofitting the existing luminaries with LEDs, thereby improving the quality and reliability of public lighting.</p>

69 Terms of the contract were for 8 years – 1 year for the installation, followed by 7 years of operation and maintenance.

70 Performance indicators for this specific project included: i) non-working lamp hours must be <2% ii) rectification of defective / non glowing lamps must be <48 hours (supplied through feeder panels) or <72 hours (single drop points).



Name of the Intervention	Overcoming Financing Barriers for Public Street Lighting through PPPs
<b>Local enabling framework</b>	<ul style="list-style-type: none"> <li>• A dedicated state-level infrastructure development fund that provided, through grants and loans, a capital subsidy for the project;</li> <li>• Supporting state-level regulatory and legislative environment on energy efficiency; and</li> <li>• Effective stakeholder engagement process that pooled local municipalities together to help reduce costs for the intervention.</li> </ul>
<b>Key lessons learned</b>	<ul style="list-style-type: none"> <li>• The importance of isolating risks related to PPP project implementation through a dedicated SPV and setting performance-based indicators and benchmarks against monthly or annual payments;</li> <li>• High transaction costs of PPPs can be offset through investment pooling (in this case, by several municipalities coming together to increase the overall value of what would otherwise be a fairly small investment); and</li> <li>• Appropriate regulatory and legislative environment to inspire private sector confidence is key.</li> </ul>
<b>Pre-requisite tasks need</b>	<ul style="list-style-type: none"> <li>• In some cases, technical assistance in structuring and negotiating PPPs might be required depending on the city;</li> <li>• Regulatory and legislative environment promoting energy efficiency;</li> <li>• Potential source of subsidy</li> <li>• Regulatory and legislative environment enabling PPPs and related procurement processes.</li> </ul>
<b>Additional information</b>	<p>It may be useful to differentiate between four general financing models that are commonly used to finance public street lighting of municipal governments:</p> <ol style="list-style-type: none"> <li><b>1) Self-financing</b> (from either own revenue sources, or through internal energy performance contracting within its own municipal organizational units),</li> <li><b>2) Debt financing</b> (e.g. low-interest loans from development banks, loans taken at a market rate from commercial banks, municipal bonds),</li> <li><b>3) Private sector financing</b> (where private sector partner either provides financing from own funds or obtains funds from third parties or through loans and where there is a clear case for return on investment) and</li> <li><b>4) Project finance</b>, where municipalities leverage public funds and raise private capital – for this, a special purpose vehicle (SPV) is established that carries the investment project on its balance sheet. The SPV is responsible for the design, installation, operation, and maintenance of street lighting for a specific contract period. The municipality usually pays monthly charges based on contract prices – which represents security for investors.</li> </ol>
<b>Sources of information</b>	<ul style="list-style-type: none"> <li>• IFC. 2017. Public-Private Partnership Stories: India – Odisha Public Streetlighting. Washington. <a href="https://www.ifc.org/wps/wcm/connect/ee587c1a-c4c2-43bd-b485-53f964a3ec12/PPPStories_India_OdishaPublicStreetlighting.pdf?MOD=AJPERES&amp;CVID=ILKahWO">https://www.ifc.org/wps/wcm/connect/ee587c1a-c4c2-43bd-b485-53f964a3ec12/PPPStories_India_OdishaPublicStreetlighting.pdf?MOD=AJPERES&amp;CVID=ILKahWO</a></li> <li>• World Bank. 2017. Investing in a Brighter Future: PPP Street Lighting Project. Washington. Available at: <a href="https://blogs.worldbank.org/ppps/investing-brighter-future-ppp-street-lighting-projects">https://blogs.worldbank.org/ppps/investing-brighter-future-ppp-street-lighting-projects</a></li> <li>• Private Infrastructure Development Group. 2017. Case Study: Odisha Public Street Lighting. Available at: <a href="https://www.pidg.org/project/odisha-public-street-lighting/">https://www.pidg.org/project/odisha-public-street-lighting/</a></li> <li>• Urban Update. December 24, 2021. Odisha to Complete Street Lighting Project By early 2022. Available at: <a href="https://urbanupdate.in/odisha-to-complete-street-lighting-project-by-early-2022/">https://urbanupdate.in/odisha-to-complete-street-lighting-project-by-early-2022/</a> [last accessed 18/10/2022]</li> <li>• The New Indian Express. December 22, 2021. Odisha’s Urban Local Bodies Asked to Complete Street Lighting Project by Early 2022. Available at: <a href="https://www.newindianexpress.com/cities/bhubaneswar/2021/dec/22/odishas-urban-local-bodies-asked-to-complete-street-lighting-projects-by-early-2022-2398329.html">https://www.newindianexpress.com/cities/bhubaneswar/2021/dec/22/odishas-urban-local-bodies-asked-to-complete-street-lighting-projects-by-early-2022-2398329.html</a> [last accessed 18/10/2022]</li> </ul>

## CASE STUDY 4: MUNICIPAL GREEN BOND FOR CLIMATE RESILIENCE IN CAPE TOWN, SOUTH AFRICA

Name of the Intervention	Municipal Green Bond for Climate Resilience in Cape Town, South Africa		
<b>Geographic region</b>	Sub-Saharan Africa	<b>Country</b>	South Africa
<b>Name of City</b>	Cape Town	<b>City Type</b>	Capital city (legislative); large city (4.6 million)
<b>Focus Sector</b>	<ul style="list-style-type: none"> <li>• Waste and water management</li> <li>• Adaptation/resilience solutions</li> </ul>	<b>Timeframe for implementation and current status</b>	Under implementation.  2017 – present (the bond has been issued for a period of 10 years)
<b>Financing mechanism</b>	Green bond	<b>Financing sources</b>	<ul style="list-style-type: none"> <li>• Private sector financing (R1 billion raised – approximately USD 67 million) mainly from financial institutions. Bond yield was 10.17% (issued at R186 rate + 1.33%). Costs associated with bond issuance included transaction costs, such as:</li> <li>• Bond Arranging Fees: R400,000 / USD 26,000 (excluding VAT)</li> <li>• Climate Bond Initiative processing fee: R10,000 / USD 680 (no VAT included) (1/10th of a basis point of the bond size)</li> <li>• Bond Assurance fees: USD 20,000 (including VAT) and non-quantified costs, such as:</li> <li>• Internal team (time spent)</li> <li>• Reporting (pre and post)</li> <li>• Investor Roadshow</li> </ul>
<b>Stakeholders involved</b>	<ul style="list-style-type: none"> <li>• <b>City of Cape Town ('Government of Cape Town')</b> – a governing authority of Cape Town, the second most populous city after Johannesburg and economic hub. Cape Town is a member of C40 Cities Climate Leadership Group, a global network of mayors working to advance climate action in their cities. Cape Town was the first municipality in South Africa to issue a certified green bond for climate resilience.</li> <li>• <b>Rand Merchant Bank</b> – a South African bank listed on the Johannesburg Stock Exchange (JSE) which arranged the issuance of Cape Town's green bond.</li> <li>• <b>KPMG</b> – consultancy firm specializing in tax, audit, and advisory services that were commissioned to undertake quality assurance for Cape Town's green bond before and after its issuance.</li> <li>• <b>Climate Bonds Initiative (CBI)</b> – international organization that develops internationally recognized climate bond standards and certifies them. Cape Town's green bond is CBI certified.</li> <li>• <b>Moody's</b> – credit rating agency providing financial research on bonds issued by commercial and government entities. Moody's rated Cape Town's green bond as 'excellent'.</li> </ul>		
<b>Barriers encountered</b>	<ul style="list-style-type: none"> <li>• Limited experience/lack of capacity with regulatory agencies and technical details associated with the design of verification and eligibility criteria for green bonds issuance;</li> <li>• Underdeveloped policy and regulatory environment for green bonds at the national level; and</li> <li>• Low penetration of financing from the private sector for resilience projects in Cape Town.</li> </ul>		

Name of the Intervention	Municipal Green Bond for Climate Resilience in Cape Town, South Africa
<p><b>Summary of the intervention</b></p>	<p>The city of Cape Town was exploring the issuance of a green bond, in order to demonstrate its green credentials (aligned to its C40 commitments) and tap into alternative financing sources. This coincided with a severe water shortage that struck the city in 2016/2017, which meant that it had to consolidate and pull forward projects to support water resilience – including water meter replacement and conservation program, zone metering and valves for water pressure management, upgrade of reservoirs, sewage effluent treatment and rehabilitation and protection of coastal structures<sup>71</sup>. These projects were then made available for financing through the proceeds of the green bond at the time of issuance.</p> <p>While the issuance of municipal green bonds is gaining traction nowadays, at the time, the green bond market in South Africa – and across Africa more widely – was seriously underdeveloped.<sup>72</sup> There are several reasons, many of which are found in other contexts. At the municipal level, there is often limited capacity for climate risk assessment and greenhouse gas emissions inventories that would enable prioritizing projects with clear environmental and climate benefits. Many cities also lack a ready pipeline of bankable projects that could be presented to potential investors that are sufficient in detail and quality, and – this tends to hold particularly true for resilience projects – some of the projects are too small in scale to meet the standards for minimum bond issuance size.</p> <p>In Cape Town, the awareness of the climate crisis was at a high level given the city’s vulnerability to disasters. In 2017, in the same year when the green bond was issued, Cape Town’s Council adopted its Climate Change Strategy and appointed a Climate Change Strategy Committee to drive the selection of projects that would form part of a project pipeline worth R2 billion (approx. USD 134 million).</p> <p>It is worth noting that the national-level policy and regulatory environment (the lack of which often acts as a barrier to green bonds issuance) in South Africa for green bond issuance was lacking; at the time, there was no green finance taxonomy in place that would include guidance, rules, and criteria that would clearly define what makes a bond ‘green’<sup>73</sup>. As a result, there was some skepticism in the private sector when it comes to the value of green bonds in the absence of a clear policy framework.</p> <p>Against such background, external verification and certification of the green bond were perceived to be crucial for building investor trust. Cape Town’s green bond was certified by the Climate Bonds Initiative (CBI) and achieved ‘Excellent’ rating from Moody’s for its governing process and how proceeds are being used, managed, and reported (this includes having comprehensive criteria for selecting investment projects and measuring impacts). The verification of the CBI standard was undertaken by an external assurance provider (KPMG) both pre- and post-issuance of the bond. Transaction costs borne by the city involved consultancy fees for the assurance process, certification fees for CBI, and originator fees (as per normal bond process).</p> <p>Following the issuance of Cape Town’s green bond, the proceeds were allocated to projects/ programs/assets identified during the issuance process and verified in the post-issuance assurance report. Accordingly, a significant amount of the proceeds went towards meter replacement and water conservation programs. Other projects financed from the bond proceeds include the replacement and upgrade of sewer and water supply networks, and coastal protection structures.</p> <p>Cape Town’s green bond issuance process is generally used as an example to underline the importance of external certification, clear investment objectives, a well-defined project pipeline, and transparent reporting on the use of the proceeds, particularly in environments with underdeveloped capital markets, inadequate regulatory environment and without previous municipal green bonds experience.</p>
<p><b>Local enabling framework</b></p>	<ul style="list-style-type: none"> <li>• Well defined policy and strategy framework at the municipal level on climate action;</li> <li>• Prepared project pipeline and targeted approach to attract investment in key sectors (in this case, water);</li> <li>• Commitment to building investor confidence through external certification and verification of the green bond;</li> <li>• Strong financial governance control at the municipal level, a strong balance sheet; and</li> <li>• Timing of the bond drawing: it was important that the bond was only raised at a time that cash was required for the budget so that the city did not have to ‘sit’ on the proceeds until they could be fully allocated in the budget.</li> </ul>

71 It is worth noting that while Cape Town’s green bond was primarily aimed at financing water projects, some proceeds were also used to finance sea-wall development, energy efficiency in buildings projects, etc.

72 While Johannesburg was the first city in South Africa to issue a municipal green bond in 2013/4, the bond was not certified by CBI, and it was the only municipal bond issued until then. Cape Town’s 1 billion ZAR green bond was the first certified and verified green bond in South Africa, which is considered to be a critical contributor to its popularity among investors – the bond was four to five times oversubscribed at its issue.

73 South African government only developed and published its Green Finance Taxonomy in 2022. For more details, please visit: <https://sustainablefinanceinitiative.org.za/working-groups/taxonomy/>.

Name of the Intervention	Municipal Green Bond for Climate Resilience in Cape Town, South Africa
<p><b>Key lessons learned</b></p>	<ul style="list-style-type: none"> <li>• Green bonds may offer an important solution to local governments’ budget deficit for adaptation and mitigation projects but need to be matched to scale, project types, and spending profile;</li> <li>• External certification and verification of green bonds is key, especially in the context of limited previous experience with issuing bonds / inadequate policy and regulatory environment;</li> <li>• Clearly defined project pipeline and well-defined process in place that enables transparent selection of priority projects is essential;</li> <li>• Strong coordination with relevant stakeholders and clear communication channels are important – in the case of Cape Town, internal communication and coordination were managed through a climate change work group, while external communication was managed by the bond arranger and the mayor’s office. Overall coordination between all actors was led by the Strategic Policy Unit (part of the mayor’s office).</li> </ul>
<p><b>Pre-requisite tasks need</b></p>	<ul style="list-style-type: none"> <li>• Regulatory framework (at the national level) that supports the municipal bond issue</li> <li>• Credit rating</li> <li>• Pipeline of bankable green projects;</li> <li>• Comprehensive investment criteria; and</li> <li>• Reporting framework with metrics for measuring impacts of results – and related capacity to monitor and report on impacts.</li> </ul>
<p><b>Additional information</b></p>	<p>As the market for green bonds matures, investors are enhancing the quality assessment of green bonds’ performance and disclosures (including quantifying the outcomes of green projects, for which metrics are not always straightforward or simple). This may add to the difficulty of trying to issue green bonds in cities where technical capacity is constrained, thus increasing the demand and importance of technical assistance and capacity building to support replication and scale-up.</p>
<p><b>Sources of information</b></p>	<ul style="list-style-type: none"> <li>• ALCB Fund. 2018. Understanding the African Bond Market. Port Luis. Available at: <a href="https://uploads-ssl.webflow.com/5f0f1ce96a1f6869277ccb5d/5f5559fa199d9b1b76bcf180_LD-ALCB-Fund-Annual-Report-2018-Booklet_LOW.pdf">https://uploads-ssl.webflow.com/5f0f1ce96a1f6869277ccb5d/5f5559fa199d9b1b76bcf180_LD-ALCB-Fund-Annual-Report-2018-Booklet_LOW.pdf</a></li> <li>• City of Cape Town. 2022. CBI Annual Update Report. Cape Town. Available at: <a href="https://www.capetown.gov.za/work%20and%20business/invest-in-cape-town/the-citys-investor-relations/external-finance">https://www.capetown.gov.za/work%20and%20business/invest-in-cape-town/the-citys-investor-relations/external-finance</a></li> <li>• City of Cape Town. 2017. City of Cape Town Green Bond Framework. Cape Town. Available at <a href="https://www.capetown.gov.za/work%20and%20business/invest-in-cape-town/the-citys-investor-relations/external-finance">https://www.capetown.gov.za/work%20and%20business/invest-in-cape-town/the-citys-investor-relations/external-finance</a></li> <li>• Correspondence with Daniel Sullivan, Manager, Strategic Policy at the City of Cape Town. October 2022.</li> <li>• Department of Forestry, Fisheries and the Environment (DFFE) and the National Treasury, Republic of South Africa. 2022. Technical Handbook on Issuing Municipal Sustainable Bonds in South Africa. Available at: <a href="https://www.cityenergy.org.za/wp-content/uploads/2022/04/technicalhandbook_sustainablemunicipalbondsissuing.pdf">https://www.cityenergy.org.za/wp-content/uploads/2022/04/technicalhandbook_sustainablemunicipalbondsissuing.pdf</a></li> <li>• Global Center on Adaptation. 2021. Green Bonds for Climate Resilience: State of Play and Roadmap to Scale, Rotterdam. Available at: <a href="https://gca.org/wp-content/uploads/2021/10/Green-Bonds-for-Climate-Resilience_State-of-Play-and-Roadmap-to-Scale.pdf">https://gca.org/wp-content/uploads/2021/10/Green-Bonds-for-Climate-Resilience_State-of-Play-and-Roadmap-to-Scale.pdf</a></li> <li>• Global Infrastructure Hub. 2021. Cape Town Green Bond. Available at: <a href="https://www.gihub.org/innovative-funding-and-financing/case-studies/cape-town-green-bond/">https://www.gihub.org/innovative-funding-and-financing/case-studies/cape-town-green-bond/</a></li> <li>• Stockholm Sustainable Finance Centre. 2020. Scoping the Sustainable Finance Landscape in Africa. Stockholm. Available at: <a href="https://www.stockholmsustainablefinance.com/wp-content/uploads/2022/05/SSFC_greenbonds_africa_report_updated.pdf">https://www.stockholmsustainablefinance.com/wp-content/uploads/2022/05/SSFC_greenbonds_africa_report_updated.pdf</a></li> </ul>

## CASE STUDY 5: PAVING A PATH FOR INNOVATION IN THE SOLID WASTE SECTOR IN GAZIANTEP, TURKIYE

Name of the Intervention	Paving a Path for Innovation in the Solid Waste Sector in Gaziantep, Turkiye		
<b>Geographic region</b>	Europe	<b>Country</b>	Turkiye
<b>Name of City</b>	Gaziantep	<b>City Type</b>	Provincial capital; large city (2.1 million)
<b>Focus Sector</b>	<ul style="list-style-type: none"> <li>• Urban sustainable energy solutions</li> <li>• Waste and water management</li> </ul>	<b>Timeframe for implementation and current status</b>	<p>Implemented. Extension of capacity is under way.</p> <p>2018 – 2021 – grant approval and Phase 1: Construction of MBTF</p> <p>2021 – present – Phase 2: expansion of the MBTF</p>
<b>Financing mechanism</b>	Grant	<b>Financing sources</b>	Financed through a EUR 9.2 million grant from the EU (through AFD) to ILBANK and UNDP
<b>Stakeholders involved</b>	<ul style="list-style-type: none"> <li>• <b>Gaziantep Metropolitan Municipality (GMM)</b> – Governing authority of Gaziantep, an industrial hub in South-eastern Anatolia, Turkiye. GMM was the beneficiary of this project.</li> <li>• <b>İller Bankası A.S. (“İLBANK”)</b> – Turkish national development bank dedicated to financing municipal infrastructure. ILBANK provided technical assistance and acted as a financial intermediary for this project.</li> <li>• <b>Agence Française de Développement (AFD)</b> – French Development Agency, in charge of the implementation of French government’s international development projects. AFD is both a technical agency and a financial institution, providing loans, grants, and technical assistance to selected beneficiaries. EU funds are sometimes channeled through AFD, which was also the case for this project.</li> <li>• <b>United Nations Development Programme (UNDP)</b> – United Nations agency providing support for the implementation of development projects through its country offices. UNDP has a strong presence in Gaziantep and has provided support to the municipality to address some of the challenges associated with the refugee crisis. Through its local office, UNDP was responsible for the procurement of services for the construction of the MBTF in Gaziantep.</li> </ul>		
<b>Barriers encountered</b>	<ul style="list-style-type: none"> <li>• Limited public financing options for the construction of the MBTF;</li> <li>• Lack of credit rating that would enable additional financing options (e.g. green bonds issuance); and</li> <li>• High inflation and currency devaluation (between 2017 and 2022, the Turkish Lira lost 3 times its value over the Euro) meaning that borrowing from international sources in non-local currency would bear significant exchange rate risk for subnational governments.</li> </ul>		

<p><b>Summary of the intervention</b></p>	<p>Gaziantep is an industrial hub in South-eastern Anatolia that has seen an exponential population increase over the last few decades; between 2015 and 2020 alone, the population grew by 8.8%. The population growth has been driven by both internal migration (with a high inflow of workers from less developed Turkish provinces due to the Gaziantep’s attractiveness as an industrial hub) and a significant influx of refugees fleeing from the Syrian civil war (approximately 450,000 Syrian refugees settled in the city between 2011 and 2021).</p> <p>Such rapid population growth resulted in a significant strain on the city’s infrastructure and public services, as well as municipal finances<sup>74</sup>. The national government budget allocation for the operation and maintenance of existing infrastructure in Gaziantep is highly underestimated due to the resident-migrant population imbalance, further exacerbating the issue. Solid waste was a key sector impacted by a steep population rise; with a lack of municipal funds, GMM was not able to finance a Biological Treatment Facility (MBTF) project of this scale on its own.</p> <p>GMM also had limited access to private-sector financing, for a variety of reasons. Due to the high inflation and currency devaluation in Türkiye, as well as there being no credit rating for the municipality, issuance of a green bond – which GMM has been considering for a while– was not possible then.<sup>75</sup> To address some of the key environmental challenges Gaziantep is facing, the Municipality needed to identify suitable mechanisms to finance a waste facility that would simultaneously decrease the pressure on existing landfills and the associated costs with their operation, provide an additional source of income, and reduce the GHG emission intensity of the solid waste sector.</p> <p>Before the refugee crisis, Gaziantep enjoyed a reputation as a regional industrial and commercial hub. In its response to the crisis, characterized by efforts to provide housing, jobs, and integration of a large population in need, GMM also raised its international profile and attracted the attention of several development partners.<sup>76</sup></p> <p>This included the EU, which launched the ‘Türkiye Resilience Project in Response to the Syria Crisis (TRP) – Municipal Service Delivery Component’ – that aimed to support the construction of suitable infrastructure assets for municipalities and municipal entities to close the financing gap created by limited government funding and local capacity to borrow. GMM’s proactive approach, clear articulation of the link between its solid waste management issues and the ongoing refugee crisis, a strong in-house technical capacity in waste management enabling highly innovative projects, made it stand out as a candidate for this funding. The allocated funds were channeled through AFD to ILBANK and UNDP, with the latter providing procurement support for the construction of the facility for mechanical biological treatment, as well as necessary vehicles and equipment.</p> <p>The first phase of the project – which involved the construction of the MBTF – was completed in October 2021, with a capacity of processing 100,000 t/y of mixed municipal waste. The facility produces 17,000 t/y recyclables, 23,000 t/y refuse-derived fuel (RDF), and generates 4,100 MWh/y of energy from the biodegradable portion of the waste. By reintroducing the recyclables into the market and generating electricity, the MBTF turned waste into a revenue stream for the municipality and reduced costs by reducing pressure on the Gaziantep Central Sanitary Landfill (the project is estimated to extend the lifetime of the landfill by up to 10%).</p> <p>In Gaziantep, GMM owns two provincial landfill sites, operated by a private contractor through a build-operate-transfer (BOT) model; this is one of the few sectors where the metropolitan municipality has actively cooperated with the private sector to improve the reliability of its services. MBTF is also operated by a private contractor, however, the revenue from the facility (through the selling of electricity and recycled resources) is channeled back to the municipality.</p> <p>GMM and ILBANK are currently preparing to implement Phase 2 of the project, which aims to further expand the capacity of the treatment plant to 300,000 t/y, build an RDF production unit of 50,000 t/y capacity, increase the capacity for anaerobic digestion and install a combined heat and power unit that will treat up to 110,000 t of organic waste a year and produce 20,251 MWh/year of renewable energy. The electricity that is produced at the facility will fully power its operations, as well as generate a surplus for sale.</p>
<p><b>Local enabling framework</b></p>	<ul style="list-style-type: none"> <li>• Strong technical capacity of the metropolitan municipality that helped build confidence in international partners;</li> <li>• Metropolitan municipality’s prior experience engaging with international development partners and IFIs and stakeholder engagement; and</li> <li>• A dedicated national development bank with expertise in municipal infrastructure provision that provided technical assistance.</li> </ul>

74 Note: GMM did not receive additional budget provisions for the large refugee population it hosted (and currently hosts). Disbursements from the national government to the Municipality are based on tax statistics of the population in that area; as refugees were not paying tax, the refugee population were not included in the budget calculations and thus the operation and maintenance of existing infrastructure in Gaziantep is highly underestimated.

75 GMM has expressed a strong interest in issuance of green bonds to finance its infrastructure investments, however, the green bond market in Türkiye is underdeveloped, especially at the municipal level, with Istanbul as the only metropolitan municipality that has issued a green bond to date.

76 Key development partners for GMM include JICA, Islamic Development Bank, European Bank for Reconstruction and Development, World Bank, KOICA, AFD, and others.

<p><b>Key lessons learned</b></p>	<p>One of the most instructive elements of this project has been the local government’s ability to convert one of its most pressing challenges – a large intake of refugees adding pressure to urban infrastructure – into an opportunity through the targeted engagement of international development partners. By cultivating an image of a welcoming, inclusive city for refugees – especially at a time when the responses to the ongoing crisis were markedly different across European countries – the city was able to attract much-needed funds to address what would have been a long-standing challenge even without the refugee crisis. Its proactive, targeted approach – in addition to strong technical capacity that helped convince development partners that it would be able to make the most of the investment – was key to the success.</p> <p>By doing so, the city successfully created a pathway for a more innovative solid waste sector that may be better placed to attract more private sector participation in the future. As such, this example may serve as an inspiration to other cities looking to make their solid waste sector more innovative, and in the process attract financing from private sources.</p>
<p><b>Pre-requisite tasks need</b></p>	<ul style="list-style-type: none"> <li>• A project concept note and business case (where applicable)</li> <li>• Technical capacity to formulate/conceptualize the initial project proposal</li> </ul>
<p><b>Additional information</b></p>	<p>N/A</p>
<p><b>Sources of information</b></p>	<ul style="list-style-type: none"> <li>• Discussions with stakeholders in Gaziantep during the first stakeholder engagement workshop were organized as part of the preparations for the Green City Action Plan (GCAP) Gaziantep in July 2022.</li> <li>• Interview with Mr. Mahir Emre Yalcin, Environmental Engineer at Gaziantep Metropolitan Municipality in Gaziantep, November 2022.</li> <li>• UNDP. 2020. Gaziantep – Waste Turns into Electricity, Greenhouse Gas Emission Decline. Available at: <a href="https://www.undp.org/turkiye/news/gaziantep-waste-turns-electricity-greenhouse-gas-emission-declines">https://www.undp.org/turkiye/news/gaziantep-waste-turns-electricity-greenhouse-gas-emission-declines</a></li> <li>• UNDP 2021. Turning Solid Waste into Resources in Gaziantep. Available at: <a href="https://www.undp.org/turkiye/press-releases/turning-solid-waste-resources-gaziantep">https://www.undp.org/turkiye/press-releases/turning-solid-waste-resources-gaziantep</a></li> </ul>

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