Financing Climate-Smart Investments in Cities
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A city’s ability to make climate-smart investments, particularly in emerging economies, often relies on the reallocation of existing budgets and the ability to increase its sources of revenue. Cities do not always have the capability to finance the investments identified in urban development plans from their budgets alone, as they rely on tax and tariff revenues, and transfers from national governments for their funding. In addition, cities often face several competing priorities and resource constraints that make it challenging to develop investible project plans and accurately quantify project costs, particularly in nascent sectors.

The investment barriers faced by cities limit what they can do on their own. Weak long-term capital planning and poorly articulated business cases can delay prioritization processes. Regulatory barriers, city budgets, and the ability to access external financing are often controlled by the national government, and local revenues are too small to service local access to finance. A survey of 100 cities worldwide found that 55 percent of municipalities identified lack of public funding as a major barrier to sustainable urban growth, while 50 percent cited insufficient national support. Where capital is available, there is often a lack of investment-ready, bankable projects. Some cities lack the capacity or knowledge to develop and report climate-smart projects that are competitive with non-climate projects in attracting finance. Most projects also require close cooperation across sectors, and smaller projects, which are more typical at city level, often need
to be aggregated by public and private actors. Aligning the interests and goals of different parties is therefore often a limiting factor for increased investment in urban mitigation projects. A lack of track record or creditworthiness exacerbates some of these challenges in much of the developing world.

The proportion of entirely city-funded projects decreases as project costs increase. Cities are using alternative mechanisms such as initial grants, subsidies, and loans for more costly projects. However, increasing up-front capital investments, operations, and maintenance costs, coupled with most municipal governments’ inability to establish creditworthiness and access capital markets, is making it challenging for cities to meet these financing needs. There is a growing mismatch between capital requirements and available resources. As cities grow, municipal governments need to broaden and deepen sources of financing, moving beyond traditional public funding to access much larger private pools of savings, particularly through domestic capital markets and commercial partnerships.

To date, cities have struggled to mobilize private sector finance at the scale necessary to address the fundamental infrastructure needs in most developing countries. While tapping into the private sector for investment is crucial in financing climate action, requirements and preconditions for private sector investment such as creditworthiness and project bankability are often not considered.

**Creditworthiness**

Countries at different levels of development and financial maturity face different financing challenges. To attract private investment in infrastructure, cities first need to be creditworthy; they need to manage finances, plan development, and engage citizens using methods that emphasize sustainability and transparency. Credit ratings serve as proxies for financial maturity, as they consider debt levels and sound public financial management by municipalities. Generally, a city can only access the international capital markets if it has an investment grade credit rating, typically BBB- or Baa up to an AAA maximum rating, indicating that it has a low risk of default on its debt obligation.
In high-income countries, cities often have debt financing options and PPP projects can also potentially offer equity opportunities to investors. Many of these cities have investment-grade credit ratings, enabling urban projects to raise debt finance in financial markets. Given high per capita income levels, essential urban infrastructure developments can generate consumer revenue streams, incentivizing private investors to invest in equity as a long-term investment.

By comparison, analysis shows that 93 percent of low-income and lower-middle-income countries have sovereign credit ratings that are below the international investment grade in terms of debt financing, thus severely constraining their access to finance. As such, the perceived risk of infrastructure projects is often too high for commercial and institutional investors in terms of equity financing, while the returns from user fees and revenue-generating assets are too low to provide a sufficient profit margin.

Cities can receive investment grade credit ratings in local debt markets even in countries that are speculative grade on the international markets, which opens up possible access to debt financing for well-managed cities in lower and middle-income countries. The World Bank’s City Creditworthiness Initiative supports cities in emerging markets to achieve this through hands-on learning programs. The initiative helps cities develop customized, preliminary action plans for specific institutional reforms and capacity building to improve their status, as well as tailored multi-year implementation assistance plans to help them close market-based financing transactions for climate-smart infrastructure projects, using local currency markets whenever possible. Every dollar invested in the creditworthiness of a developing country’s city through the initiative has the potential to leverage more than $100 in private sector financing for low-carbon and climate resilient infrastructure.

National governments are also supporting their cities to improve their creditworthiness. Recognizing the potential of cities to raise financing on domestic capital markets, India has issued a guidance note on the use of municipal bond financing for infrastructure investments. The note provides actionable, step-wise inputs on preparatory actions to enhance creditworthiness, the regulatory framework, and the process of bond issuance.
Project Bankability

Investment-readiness and bankability are essential criteria for lenders to provide project financing or investors to take an equity exposure in projects. A project's bankability is determined by its legal and regulatory framework, its inherent risks, including the project sponsors and their track-record, the technology, the long-term nature of projects, initial costs, revenue sources, and the allocation of these risks across the different phases of the project through the financing structure. As the bankability of an infrastructure investment is determined at the project development stage, failure by cities to develop project pipelines tied to long-term urban development plans and objectives can limit project pre-feasibility analysis and thereby undermine the quality of design. Critical challenges in the project preparation stages can have repercussions for the development of pipelines of investment-ready climate infrastructure projects that are up to scale and quality, as well as answering risk assessment requirements to allow for private investment. These challenges include lack of financial autonomy of cities; political interference and electoral cycles; local governments’ financial management capacities; missing technical capacity for designing, negotiating, and implementing urban projects; and access to financing, all of which affect the ability to implement infrastructure investments and the future commercial viability of urban services.400

The quality and readiness of projects is therefore considered to be one of the biggest constraints to private sector investment due to perceived risks, including unpredictable revenues, land acquisition issues, environmental clearance delays, construction period delays, cost increases, and unavailability of long tenure financing.401

Project development information needs to improve in order to accelerate climate action. By supporting municipal governments to reduce information asymmetries and the perception of risk, substantial sources of private and institutional finance, nearly $120 trillion of assets currently under management by a range of private and institutional investors, could be directed into financing sustainable infrastructure in urban areas.402 The first step in improving the relationship between cities and financial institutions is for cities to enhance their project development information. This information needs to be disseminated and communicated clearly to the finance industry through, for example, the CDP's annual disclosure platform. This is particularly important as cities often do not use the climate or resilience label for projects that in fact do have mitigation or adaptation properties. Cities can reduce transaction costs and provide the predictability needed to facilitate private sector participation by enhancing strategic planning and prioritization of urban projects, improving project pre-feasibility analysis, and ensuring standardized processes, documents, and data for project procurement. Using credit enhancement or alternative funding structures can also help cities improve risk allocation and project bankability. To ensure sufficient finance flows to these vital sustainable infrastructure projects and enable the market shift needed, capacity building within cities and investors is urgently required. Project preparation facilities and initiatives hosted by multilateral development banks, domestic financial institutions, and others such as the Global Infrastructure Hub are supporting cities to build a pipeline of bankable infrastructure projects.
Financing Instruments

The financing gap can be narrowed by tapping into a wide range of potential sources of funding and financing (including own revenues through taxes, tariffs and fees, debt and equity financing, land-based financing, and transfers by the national governments), and by deploying new and innovative models of finance and investment based on stakeholder collaboration and partnerships. A primary mechanism used to finance capital-intensive, sustainable infrastructure is PPPs. Targeted taxes and incentives can also be used to incentivize investment in sustainable infrastructure by favoring density over urban sprawl, or low-carbon energy over fossil-fuel sources. Other public instruments include land value capture mechanisms to encourage sustainable infrastructure development while leveraging funding for finance. Grants and subsidies are of particular importance for cities with limited public resources, and can be used to support projects with significant potential for leveraging additional sources of finance while delivering sustainable outcomes.403

Debt financing instruments, such as bonds and loans, can be used to supplement public finance to encourage investment in sustainable infrastructure. Loans and guarantees from government or development finance institutions can support debt finance provision in developing countries for urban infrastructure financing, where domestic financial markets are underdeveloped or access to capital markets is restricted. Equity instruments can also support investment in sustainable infrastructure.404 The exact range of instruments at a city’s disposal will vary depending on the local context.405

Municipal governments can use the most suitable financial instruments when considering their funding and financing options, applying best practice from developed countries if relevant. There are several potential urban finance mechanisms that can have a profound effect on the ability of local and national governments to meet their investment requirements and close their financing deficits. The details of these mechanisms and cities’ experiences with them are described below. In each case, the deployment of these mechanisms required national ownership and tailoring to local circumstances, political viability, and development needs.
Green and Municipal Bonds

Green bonds have great potential to drive climate-smart investment by allowing cities to acquire long-term debt at stable prices. They are well suited to larger projects or project portfolios with large upfront costs, where such access to capital is essential. Governments, both national and subnational, can raise private debt capital to finance infrastructure by issuing bonds (in addition to traditional bank lending for project and operational finance). Labeling and standards, such as the Green Bond Principles, can ensure that the debt finance is used for green investments. To access debt financing, governments need to have budgetary, accounting, and financial management capabilities in place, as well as sufficient sources of funding to make repayments. Although the cost of finance will depend on the structure of the bond and the creditworthiness of the project and the issuer, this is generally a competitively priced source of long-term finance. In all cases, national governments play a critical role in supporting cities to deliver on their strategies through national-level regulatory frameworks, coordinated funding, and governance.

The supply of green bonds is growing rapidly, and issuance is expected to reach between $185 billion to $210 billion in 2018. A growing proportion of these bonds are issued to fund climate change mitigation and adaptation in urban areas. For the green bond market to be successful, their risk-return must be as attractive to investors as non-green bonds. City and regional green bonds fund energy-efficiency, public transit, and social housing, while private real estate green bonds fund green buildings. Bonds issued by cities, municipal regions, and private real estate firms made up 13 percent of all green, social, and sustainability bonds in the first half of 2018.

Over the last 15 years, pooled municipal bond issuances have mobilized close to $3 billion in developing countries to finance a range of essential public services, including water and sanitation, energy, and transport. A total of 650 small projects have been financed through this method in India, South Africa, Colombia, Kenya, and Mexico, showing the scalability of this financing method.

Municipal debt financing has not, however, been a panacea to infrastructure investment needs, even in high-income countries. Many municipalities have acquired substantial levels of debt through bond issuances and private loans, but capacity to collect revenues from taxation remains low, resulting in city bankruptcy. Notable examples include Detroit and San Bernardino in the United States. As a result, political support to implement municipal decentralization reforms is often scarce. According to the Inter-American Development Bank governance database, less than half of countries (42 percent) are recorded as devolving fiscal or legislative powers to subnational governments, and of these the depth of revenue-raising powers is highly variable. In a global study, only 16 percent of countries sampled were found to grant significant taxation autonomy to their local governments. Similarly, 56 percent of countries forbid any kind of borrowing by local governments, while only 22 countries (14 percent) allow borrowing without any restrictions. As of 2013, only 4 percent of the 500 largest cities in developing countries had access to international debt markets, and only 20 percent are creditworthy in local markets. Only one in five C40 cities are able to borrow from their national government, and only one in four can issue municipal bonds.

This lack of autonomy increases the difficulty of securing financing for cities’ infrastructure projects and constrains cities’ ability to establish partnerships to make development plans sustainable and resilient. Cities with constrained access to capital markets can often access financing through international financial institutions or development banks instead.

In countries where subsovereigns can issue bonds, like Australia, Canada, France, South Africa, and Sweden, many cities and regions are issuing green bonds.
CEPAC BONDS IN RIO DE JANEIRO, BRAZIL

Certificates of Potential Additional Construction (CEPAC) have been used as an innovative method of leveraging private funds for public investments in Brazil since 2001, and in Rio de Janeiro specifically since 2009. Urban legislation defines the construction potential for real estate in every neighborhood, setting standard dimensions such as the type, size, and height allowed. Investors wanting to build beyond these dimensions must purchase CEPAC bonds. Since different types of buildings require a different CEPAC bond value, the government can incentivize the construction of particular buildings and techniques, such as green buildings, by requiring fewer CEPACs for their construction. These bonds are auctioned on the market and purchased by private investors or developers. In the Porto Maravilha district, for example, the Caixa Econômica Federal (a federal government bank) acquired all of the CEPAC bonds on auction, amounting to $960 million, through a guarantee fund the bank manages (the Fundo de Garantia do Tempo de Serviço).

The revenue gained from the auction of these bonds provides the cities with a new source of capital and is used to invest in low-carbon infrastructure. The revenue is typically captured in a separate fund, which can be used in the specified zone for upfront construction costs, such as public transport, waste management and water piping, and long-term maintenance. In the Porto Maravilha district, revenue gained has been used to construct new public infrastructure, including 66km of drainage systems, 85km of sewer systems, and 120km of water systems.

The CEPAC bond circumvents traditional bank financing. The municipal governments in São Paulo, Rio de Janeiro, and Curitiba have obtained about $3.8 billion for investing in urban redevelopment projects by issuing more than 10 million CEPAC bonds. CEPACs provide an alternative mechanism that compensates private investors through the likely increase in real estate value for their investments. It is also beneficial from a fiscal perspective. CEPACs do not increase public debt.

CITY GREEN BOND IN JOHANNESBURG, SOUTH AFRICA

The city pioneered the use of green municipal bonds in emerging markets to raise funds for sustainable urban development projects. The 10-year bond, aligned with the Green Bond Principles, was launched in 2014 and is worth $143 million. This was Johannesburg’s first bond issuance to be specifically labelled green and to be aligned with the city’s Energy and Climate Change Strategy and Action Plan. The strategy and action plan were used to identify key low-carbon projects across a range of sectors, such as energy, water, waste, and transport, to be supported by the bond’s proceeds. This information was essential to investors, as it gave them assurance of both an attractive risk-return profile, and of the environmental and social benefits of the project. To date, projects include investment into 150 new dual fuel and 30 biogas buses, the establishment of waste-to-energy generation sites, energy-efficiency measures in buildings (including the implementation of 42,000 smart meters), sewage effluent treatment, and water management initiatives such as water meter installations, reservoir upgrades, and water pressure management.

The bond’s popularity among private investors has been instrumental in its success. In 2014, an auction held for potential investors was oversubscribed by 150 percent. The bond has an AA-rating, reducing the risk to investors and making the investment more attractive. The Mayor of Johannesburg has been an active proponent of low-carbon investment and the city has been internationally recognized as a leader in climate action. This international and domestic publicity was critical in raising awareness of the importance of green bonds and boosting investor confidence. The bond has allowed the city to act on its commitment to respond to climate change while receiving a market-related financial return.

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because they serve simply as a mechanism to transfer building rights, with developers retaining the risk of developing their private projects.

This financing model has the potential to be applied in cities with buoyant housing markets. The mechanism relies on the purchase of permits to construct buildings, which means the model should only be applied to cities with a healthy and stable housing market anticipating rising land and property values. The success of these bonds also relies on considerable financial expertise in order to administer the system.420

POOLED MUNICIPAL BOND ISSUANCE IN TAMIL NADU, INDIA

The Water and Sanitation Pooled Fund in Tamil Nadu is a pooled bond, issued by the state government to raise financing for water and sanitation services in 13 small urban local bodies. These bodies were not able to access finance due to bond issuance fees, legal costs, and an inability to get a credit rating.421 The pooled fund mobilized capital market finance through a $4.4 million unsecured unstructured debt obligation,422 supported by the implementation of a multi-layered credit enhancement package, which gave private investors’ confidence to invest.

Tamil Nadu capitalized a debt service reserve fund worth about $1.42 million, which gave investors assurance that the fund could pay creditors if the municipal borrowers were unable to meet scheduled repayments. Revenues from tax collections, including property tax, and project revenues provided extra funds. There was also a local service reserve fund, which comprised about 5 percent of the principal amount borrowed by each urban local body. USAID guaranteed they would help re-supply 50 percent of the principal amount of a default paid for by the debt service reserve fund.

Following the issuance of the bond, a number of projects were implemented, including water supply augmentation schemes for all 13 municipalities and an underground drainage project for Madurai Corporation.423 By pooling the finance, the bond provided the access to capital necessary for smaller municipalities to fund large-scale infrastructure projects, which they had not previously been able to do.

The multilayered credit enhancement package is an essential element for successful replication in other cities as it creates a supportive environment for potential investors. Without this guarantee, cities would likely struggle to gain sufficient investment. To ensure the longevity of a pooled financing initiative, bonds should be reissued immediately after they mature to avoid depleting expertise and momentum and creating a lack of liquidity.
Land Value Capture

Land value capture can be used at scale and is an economically efficient system to meet the costs of climate-smart infrastructure investments, representing an effective alternative to mainstream financing methods. It is a financial policy tool allowing municipal governments to recover a portion of the increase in land and property values that result from public investments, to improve nearby urban infrastructure. This in turn enhances the quality of housing, jobs access, transport, and social benefits. The boost in value can be used as a source of revenue to secure or reimburse upfront infrastructure funding, and can also be used to drive more compact urban development. By levying the direct beneficiaries of public improvements, who would otherwise benefit from such improvements as windfall gains, a city is able to unlock additional funding particularly when faced with limited access to traditional sources of public financing. This approach promotes infrastructure cost-sharing, with win-win outcomes for public and private stakeholders by creating private economic value that also benefits the location.

There are a range of approaches that cities can take to capture these land value gains, including land value taxation, leveraging public land and property assets, tax increment financing, special assessments, transfer of development rights, betterment levies, land pooling, transport utility fees, impact fees, and air rights. These mechanisms can be promoted on both privately owned and public lands, depending on local context, but are most effective in burgeoning real estate markets. National legislation and frameworks are critical to enabling this local revenue stream, as higher levels of government often retain the power to set the parameters and tax rates. The city benefits from improved municipal revenues, in addition to having an improved urban environment and self-financed infrastructure, increasing its overall attractiveness for private financing. However, regulatory constraints, inadequate land controls and insecure property rights, deficient technology and data systems, and lack of knowledge and management capacity can hinder the implementation of this approach.

Despite being largely associated with transport upgrades, land value capture opens financing opportunities for many more infrastructure investments, particularly when city governments integrate spatial planning policies and investment strategies with transport infrastructure.

NORDIC GREEN BOND MODEL

Nordic actors have been part of the green bond market from the start and their participation has been driven by key public sector actors such as the four Nordic local government funding agencies. These are special purpose agencies owned by local authorities that issue bonds in the capital markets, domestically and internationally, and on-lend the proceeds to smaller local authorities and cities that are members/shareholders of the agency. The local government funding agency aggregation model allows smaller cities to tap into the deep pools of capital held by institutional investors in the $90 trillion bond market. This has been harnessed for green financing purposes since 2011, with all four Nordic agencies issuing at least $8.5 billion in green bonds as of 2018, and representing a quarter of the total Nordic green bond market.

The Nordic green bond market, which in 2018 stands at about $33 billion of cumulative issuance, was kindled by Norwegian agency Kommunalbanken. In 2013 the agency offered a three-year $500 million green bond—the first of its kind in the Nordic countries. The city of Gothenburg, supported by the Swedish investment bank SEB, expanded the Nordic green bond market later in 2013, followed quickly by Orebro, the Stockholm County Council, and Oslo in 2015, with a dozen other cities following across Sweden and Norway. Cities and regions on their own account for $3 billion, or 9 percent, of the Nordic green bond market.
SABARMATI RIVERFRONT UPGRADE, AHMEDABAD, INDIA

An ongoing project aims to provide the city of Ahmedabad with an improved and accessible waterfront along the Sabarmati River, reduce erosion and exposure to flood risk, upgrade sewers, and rehabilitate and resettle informal settlements. Through an initial investment of $17 million in heavy engineering works and land reclamation, a 22km-long lower river promenade has been completed, and the upper promenade is in development. The key financing sources for this project were loans from a local municipal corporation and a central government financial institution that were placed in a special purpose vehicle established to manage this initial investment in riverfront upgrades and subsequent land sales to the private sector.

The project is self-financed. Cash for recovery of capital expenditure and operating costs comes from sales of reclaimed and serviced land for commercial development. The completion of major infrastructural components has already led to increased land values, thus reducing the amount of land that needs to be transacted for servicing the loans. Overall the amount invested has been recovered from sales of less than 15 percent of improved land.

MASS TRANSIT RAILWAY, HONG KONG, CHINA

Land value capture was used as a financing solution to fund the mass transit railway in Hong Kong between 1998 and 2013. The Mass Transit Railway Corporation bought an area of land and invested in railway infrastructure, increasing the overall land value. The property was then sold to private investors at a profit. The corporation harnessed the added value from the land to invest in further railway infrastructure. Using this approach, it generated $11 billion from the sale of property, which was twice as much as it invested in the railway infrastructure.

The project’s success relied on close cooperation between the Mass Transit Railway Corporation, the government, and other private investors. The corporation worked with the government to assess the cost of construction and purchase the right to develop properties above railway stations and depots for 20 years. Through public tender, the corporation allocated these property rights to private developers, who paid in full for the development costs, including the cost of construction of the residential and commercial properties. The corporation agreed to portion the profits generated by the sales if the private partners sold all units before the contractual deadline. This ongoing profit ensured the continued development of the railway line and was instrumental in the success of the land value capture approach.

Replicating this method in other cities will require careful macroeconomic management. The success of the mass transit railway land value capture depended on the transparent valuations of real estate, as well as the ongoing increase in land value. The continuous flow of capital leveraged from this project relied on the careful monitoring and evaluation of land value by technical and legal experts, as well as a buoyant real estate market. For the method to be successful, both a stable economy and technical expertise are essential.

This method is only suitable in cities that need infrastructure and are in a growth phase. The consistent revenue generated from the land value capture process depended on the demand for the development of the railway. This was closely linked to the ongoing development and growth in the city, both in terms of population and economy. For any cities replicating this model, infrastructure demand and urban growth are necessary conditions.
returns on revenue-generating assets. Energy and road infrastructure projects, which often extend beyond the municipal scale, have attracted the vast majority of global PPP finance, due to market regulations and policies that are primarily established at a national level, and thanks to clear income streams from these assets. Ensuring fair and affordable pricing and adequate service coverage is essential in structuring PPP design and incentives.

PPPs are complex structures. Their effectiveness depends heavily on appropriate project identification, structuring, contractual arrangements, and government capacity. They have been effective as an approach for the private sector to generate relevant returns on investment, develop local capabilities, and increase the level of international private sector participation. However, asymmetric information between levels of government and between the public and private partners can lead to rent-seeking behavior. Without tight monitoring and public expenditure management, PPPs can effectively create hidden liabilities for government agencies, and are therefore a particularly important instrument in middle and high-income countries with mature financial systems.

In a PPP model, risks are appraised early on to determine project feasibility, allowing the private partner to check against unattainable government expectations. PPPs require strong legal and regulatory frameworks to avoid expropriation and minimize risks to private investors. Without this assurance, only traditional, less risky, public infrastructure provision is feasible. Laws governing PPP activities across different departments need to be consistent with one another. A lack of transparency in the bidding and project supervision processes can deter private sector investors. Governments can enable the greater use of PPPs by establishing a pipeline of feasible projects, providing regulations and legislation that allow cities to enter into PPP transactions, and clarifying the way tariffs are set and the mandate of regulatory oversight processes and agencies. National or municipal-level PPP units that support project preparation and tendering can enhance the accountability, transparency, and competitiveness of the process, thereby attracting greater private sector interest.

Public-Private Partnerships

These are defined as long-term contracts between public and private entities to develop or manage public assets or services where risks are allocated between the parties and remuneration is linked to performance and/or the demand or use of the asset or service. PPPs have been effective when governments face technical, institutional, and financial constraints. They can bring private sector innovation, efficiency, and financing together in one package. There are many forms of PPPs, but their potential is typically limited to projects that involve commercial
PPP FINANCING OF THE BEIJING METRO LINE

A special purpose vehicle was set up to finance the fourth Beijing metro line, stretching almost 28km with 24 stations. The PPP model adopted was predominately public sector owned and operated, with inputs from the private sector to provide infrastructure. The Hong Kong China Mass Transit Railway Corporation and the Beijing Capital Group were awarded the project contract. The Beijing Capital Group is a large state-owned enterprise affiliated with the State-Owned Assets Supervision and Administration Commission of the Beijing municipal government, focusing on investment, financing, and capital operations of infrastructure projects in the city. The Beijing municipal government funded 70 percent of the project cost to cover the civil engineering and infrastructure of the project.

The second part of the project, which covered operational aspects, was undertaken at 30 percent of the total project cost. The project is financed by ticket sales revenue and the commercial operation of the subway stations. While the Mass Transit Railway Corporation and the Beijing Capital Group manage the operations of the subway line, the Beijing Infrastructure Investment Company monitors the management of assets, quality, and safety.

The innovative PPP model uses private companies’ incentives to maximize profits as a means to balance investment risks and rewards. The Beijing Infrastructure Investment Company acts as a risk absorber, compensating the joint venture partners if the profits are substantially lower than expected and thus providing the partners with certainty of return on investment. In parallel, the Mass Transit Railway Corporation and the Beijing Capital Group are incentivized to maximize efficiency as they take on any excess profits made.

In the urban context, mobility is a public policy objective. As a result, public authorities often control fares and, to some extent, service levels, to ensure affordability and coverage. Ticket revenues are thus unlikely to be able to cover any new investment for system upgrades or expansion. Urban transport projects must therefore explore other areas of revenue generation, including land value capture, dedicated fiscal instruments, commercial revenues, and contingent liability coverage. They must also rely on some degree of public subsidy, either through revenue support or capital grants.

CLEAN RIVER GANGA PROJECT, INDIA

The Indian government approved a hybrid annuity PPP model for sewage treatment plants under the National Clean Ganga program in 2016. Over 75 percent of the sewage generated in the towns and cities along the Ganga flows untreated into the 2,525km-long river, which is a water source for 43 percent of India’s population. IFC helped to structure and tender India’s first-of-its-kind PPP to enable private companies to build sewage treatment plants in Haridwar, Varanasi, and Mathura—cities that discharge millions of liters of untreated sewage into the river. The three plants will process nearly 200 million liters of sewage per day.

The PPP model links the performance of new sewage treatment plants with payments to the private sector partner. Under the hybrid-annuity model, the government pays 40 percent of the project cost linked to construction milestones. The remaining 60 percent, supported by a World Bank loan, will be paid over 15 years as annuities to the private operator along with operation and maintenance expenses. This makes the project more viable for the concessionaire and gives the government leverage over the performance of the operator. The new sewage treatment plants and rehabilitated infrastructure assets in Varanasi and Haridwar have opened up a large market for the private sector in India, including national and international companies. The model is being replicated in 11 cities and will be the foundation for dozens of sewage treatment PPPs along the Ganga River, multiplying the environmental and social impact and improving water quality for millions of people.
Dedicated Funds

With support from multilateral development banks, government departments, commercial banks, and private investors, cities are developing dedicated vehicles to enable green investment by the private sector. The success of these approaches is contingent on the cities having a long-term vision and commitment to green investment, with a clear pipeline of projects. In all cases, establishing dedicated funding vehicles relies on close cooperation across a range of stakeholders. Recruiting credible fund managers with detailed technical knowledge is essential for boosting the confidence of the private sector and should be seen as a prerequisite for establishing green funds in other cities.

LONDON GREEN FUND

The London Green Fund provides funding for projects investing directly in waste, energy-efficiency, decentralized energy, and social housing to both public sector organizations and small businesses that are unable to access funds via mainstream finance. The $526 million fund\(^{432}\) was set up in 2009 to help the city achieve its aim of reducing greenhouse-gas emissions by 60 percent below 1990 levels.\(^{433}\) The fund is made up of three smaller funds, which target waste, energy, and social housing projects. The Foresight Environmental Fund provides equity finance for waste management; the London Energy-efficiency Fund provides debt finance to private and public sector energy projects; and the Greener Social Housing Fund provides investments for social housing, including the refurbishment of over 2,500 properties to make them more environmentally friendly. Since 2014, the fund has invested $135 million in 18 projects, which are estimated to have saved 288,805 metric tons of CO\(_2\)e per year, and diverted 440,980 metric tons of waste from landfills annually. The London Green Fund is managed by the EIB and is funded by the London European Regional Development Fund Program, the Greater London Authority, the London Waste and Recycling Board, and private investors.

Private sector investors played an important role in the London Green Fund. As the financial instruments were seen as attractive investment opportunities for growing the corresponding market, investors contributed a significant portion of the total fund. Investor confidence was also boosted by the credibility of the appointed fund managers, all of whom had a track record in environmental fund management. Funds like the London Green Fund are unusual in the commercial market due to their small geographic focus and niche investment theme of environmental infrastructure. By addressing uncertain market demand, risks around new technologies, and long lead times until returns are generated, the fund has been able to make projects less risky for the private sector.

CITIES DEVELOPMENT INITIATIVE FOR ASIA

The Cities Development Initiative for Asia has been supporting the financing of sustainable infrastructure projects since 2007. It is a regional initiative managed by the ADB, the German government, and Agence Française de Développement. It is funded by the governments of Austria, Sweden, Switzerland, the United States, and the United Kingdom, and established as a multi-partner trust fund under the Urban Financing Partnership Facility from October 2017. The initiative works closely with medium-sized cities in Asia and the Pacific to fund projects relating to urban transport, wastewater management, flood and drainage management, water supply, solid waste management, and social infrastructure.\(^{434}\) As of June 2018, the initiative has assisted 94 cities across 19 countries, of which 71 have linked their project preparation studies to downstream financing amounting to about $7.7 billion.\(^{435}\) For example, the Cities Development Initiative invested $451,000 in the project preparation study on flood and drainage management, solid waste management, and urban transport in Khulna, Bangladesh, which was subsequently linked to an ADB loan. In Palembang, Indonesia, the initiative invested $403,000 in urban transport, which was later financed from budget allocations by the local and national governments.

The initiative works closely with the private sector, bridging the gap between cities’ development plans and the implementation of their infrastructure investments. It helps cities structure their projects to attract market-based international private investment and strengthens local institutional prerequisites to attract capital investment, including marketing local investment proposals to potential financiers. It also helps cities create strategic master plans, which are ready to be presented to these financiers and project developers.
Climate-Smart Investment Initiatives

The different financing approaches identified above will largely benefit creditworthy metropolises and megacities. The vast majority of intermediary cities will need support to establish solid and stable climate finance ecosystems and integrate climate into the development frameworks for all sectors and actors. Innovative financial and collaborative approaches will be key to promoting central and local ownership of climate issues, preparing bankable projects, developing domestic financial markets, and mobilizing private financing for local investment, while increasing local governments’ revenues and improving creditworthiness for fiscal autonomy and access to capital markets when possible.

A range of initiatives are already attempting to fill these gaps. To synthesize the current status and landscape of support relating to investment in climate-smart solutions for cities, IFC has researched and mapped almost 30 supporting initiatives, actions, and platforms for climate-smart solutions that are being taken by cities, international or domestic institutions, companies, voluntary groups, donors, or special vehicles. This is not an exhaustive list and is intended to offer an indicative overview of the leadership being provided by national and municipal governments, private sector actors, and international organizations involved in these initiatives to varying degrees.

The mapped initiatives below include some with a direct focus on city and climate projects and others that indirectly support these priorities through alternative channels or the mandates of the institutions or countries that founded them. All provide replicable examples for cities to draw from. The detailed mapping, available in Annex B, captures information on applicable geographies and sectors, type of climate-smart investment solution, and the activities and funding amounts (if applicable) offered by the initiative.
<table>
<thead>
<tr>
<th>Initiative</th>
<th>Organization</th>
<th>Objectives</th>
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<tbody>
<tr>
<td><strong>100 Resilient Cities</strong></td>
<td>100 Resilient Cities</td>
<td>100 Resilient Cities is a network that aims to help cities around the world become more resilient to the physical, social, and economic challenges inherent to the 21st century. This includes both large-scale natural disasters and local everyday stresses, such as unemployment and chronic food and water shortages.</td>
</tr>
<tr>
<td><strong>Africa50</strong></td>
<td>African Development Bank</td>
<td>Africa50 is an infrastructure investment fund that contributes to Africa’s growth by developing and investing in bankable projects, catalyzing public sector capital, and mobilizing private sector funding. A significant proportion of the investment targeted by the Africa50 initiative is projects demanded by cities. Africa50’s primary target sectors are transport and power, which represent almost 70 percent of the continent’s projected infrastructure investment needs between now and 2025. Transport sector projects include roads, airports, ports, and logistics, many of which take place within an urban context. Climate objectives are secured via the mission of the fund. It was established under a governance structure convened by the African Development Bank.</td>
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<tr>
<td><strong>Africa Climate Resilient Investment Facility (AFRI-RES)</strong></td>
<td>World Bank</td>
<td>AFRI-RES is a network of technical experts that aims to strengthen the capacity of African institutions (including national governments, river basin organizations, regional economic communities, and power pools), and the private sector (project developers and financiers) to plan, design, and implement infrastructure investments that are resilient to climate variability and change. A central function of AFRI-RES is to facilitate interaction between policymakers, financiers, project developers, and scientific and engineering experts in order to develop and mainstream relevant new practices. AFRI-RES’s scope spans different sectors and different stages of the planning and project development process. Much of its targeted investments are projects located in cities, with roads and power as the two priority sectors.</td>
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<tr>
<td><strong>African Water Facility</strong></td>
<td>African Development Bank</td>
<td>African Water Facility is a multilateral fund which aims to implement innovative water projects and raise investment for water projects throughout Africa.</td>
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<tr>
<td><strong>C40 Cities Finance Facility</strong></td>
<td>C40 Cities Climate Leadership Group</td>
<td>C40 Cities Finance Facility aims to deliver project preparation and capacity development, and to share knowledge and establish partnerships between cities and financiers.</td>
</tr>
<tr>
<td><strong>Catalytic Finance Initiative</strong></td>
<td>Bank of America Merrill Lynch</td>
<td>Catalytic Finance Initiative is a partnership among selected commercial banks, development finance institutions, institutional investors, and philanthropies that aims to structure and deploy at least $10 billion in green business, primarily in clean energy. Some of the investments targeted by the initiative involve projects located in cities, as it aims to promote the SDG objectives, including acting on climate change and advancing access to clean energy and water.</td>
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<tr>
<td><strong>Cities and Climate Change in Africa</strong></td>
<td>Agence Française de Développement, European Union, Swiss State Secretariat for Economic Affairs</td>
<td>Cities and Climate Change in Africa is a regional support program for local authorities that aims to help 20 to 25 African cities translate their climate strategies into action plans, budgets, and investment projects that can attract (climate) finance and have mitigation and adaptation co-benefits by 2020.</td>
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<tr>
<td>City Creditworthiness Initiative</td>
<td>World Bank</td>
<td>The City Creditworthiness Academy is a series of training initiatives that aims to help 300 cities in 60 low and middle-income countries to improve their financial performance and secure the private investment they need to fund climate-smart infrastructure and services. Building creditworthiness in cities is a key constraint in accessing further investment and finance for city and climate projects.</td>
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<tr>
<td>City Performance Tool (CyPT)</td>
<td>Siemens</td>
<td>CyPT aims to help cities evolve, and to offer them strategies and tools to ensure they become social, cultural, and economic hubs.</td>
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<tr>
<td>City Resilience Index</td>
<td>Arup</td>
<td>The City Resilience Index is a tool which aims to inform all cities about how they can best respond to the risks posed by climate change, both by identifying weaknesses and suggesting improvements.</td>
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<tr>
<td>City Resilience Program</td>
<td>World Bank</td>
<td>The City Resilience Program aims to catalyze large-scale, long-term and comprehensive investments in urban resilience projects in emerging markets by assisting cities to access non-traditional sources of financing through the design of high-return investment projects and a reduction of risk and transaction costs, which make investments more attractive to private and institutional investors.</td>
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<tr>
<td>Clean Technology Fund</td>
<td>Climate Investment Funds</td>
<td>The Clean Technology Fund aims to scale up low-carbon technologies with significant potential for long-term greenhouse-gas emissions savings. Over $4 billion (75 percent of the fund’s resources) is approved for implementation in renewable energy, energy-efficiency, and clean transport.</td>
</tr>
<tr>
<td>District Energy in Cities Initiative</td>
<td>UN Environment; Global Environment Facility; Sustainable Energy for All</td>
<td>The District Energy in Cities Initiative is a partnership of 40 public and private partners that aims to accelerate the transition of cities in emerging economies and developing countries to low-carbon, climate resilient societies through modern district energy systems.</td>
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<tr>
<td>Energy-efficient Cities program</td>
<td>Energy Sector Management Assistant Program</td>
<td>The Energy-efficient Cities program consists of two complementary windows: efficient and sustainable buildings; and energy-efficient city services, which together support and seek to expand the World Bank Group's efforts to help countries and cities harness their energy-efficiency potential. It aims to create an enabling policy and regulatory environment for energy-efficiency; integrate energy-efficiency in projects across sectors (urban, water, transport); and develop delivery models and financing mechanisms to scale up energy-efficiency.</td>
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<tr>
<td>Financing Energy for Low-Carbon Investment—Cities Advisory Facility (FELICITY)</td>
<td>EIB, GIZ</td>
<td>FELICITY aims to support emerging economies, namely Brazil, China, and Mexico, with both technical assistance and the financing of sustainable infrastructure projects.</td>
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<tr>
<td>Financing Sustainable Cities Initiative</td>
<td>World Resources Institute Ross Center for Sustainable Cities; C40</td>
<td>The Financing Sustainable Cities Initiative aims to help cities accelerate and scale up investments in sustainable urban solutions through the development of innovative business models.</td>
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<tr>
<td>Fund for Technical Expertise and Experience Transfers</td>
<td>Agence Française de Développement</td>
<td>The Fund for Technical Expertise and Experience Transfers funds technical-cooperation programs and project-preparation studies in developing countries, to meet their requests and needs, while working towards the sustainable development of those countries. One project funded is the Smart Cities Mission. This is an urban renewal program by the government of India, with the aim of using French expertise to enhance the quality of life for urban dwellers through sustainable and innovative solutions in 100 Indian cities.</td>
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<tr>
<td>Global Innovation Lab for Climate Finance</td>
<td>Climate Policy Initiative</td>
<td>The Global Innovation Lab for Climate Finance aims to drive billions of dollars of private investment to the low-carbon economy by identifying, developing, and supporting transformative sustainable finance ideas. Examples of city-level projects supported by the lab include financing for low-carbon auto-rickshaws, which is a facility designed to deploy more electric auto-rickshaws in Indian cities, and a battery subscription facility mechanism to provide long-term debt financing to the electric transit sector in India.</td>
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<tr>
<td>Green Bonds for Cities</td>
<td>South Pole Group, Climate Bonds Initiative</td>
<td>Green Bonds for Cities aims to support cities in emerging, developing, and transition countries to access the green bond market. The objective is to commercialize the outputs of the 2016 project, which sought to enable more local authorities to use debt markets to finance low-carbon infrastructure.</td>
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<tr>
<td>Green Cities Framework</td>
<td>EBRD</td>
<td>Green Cities Framework aims to address the most pressing environmental and climate change challenges facing cities through targeted planning, capacity building, and project development and investment.</td>
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<tr>
<td>HSBC Sustainable Finance Fund</td>
<td>HSBC</td>
<td>The HSBC Sustainable Finance Fund aims to enable the transition to a low-carbon economy by investing in energy-efficiency, renewable energies, new technologies, and infrastructure, and by helping clients manage transition risk. Much of this investment is urban focused. The HSBC Sustainable Finance team has a dedicated unit responsible for financing of bus rapid transit systems.</td>
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<tr>
<td>InfraFund</td>
<td>Inter-American Development Bank</td>
<td>InfraFund aims to assist public, private, and mixed-capital entities in Latin America and the Caribbean to identify, develop, and prepare bankable and sustainable infrastructure projects that have the potential of reaching financial closure. By sector, InfraFund has approved nine technical cooperation operations for energy projects (five of which are for renewable energy and energy-efficiency), seven for transportation projects (including an airport, road, bus rapid transit system, and railway), five for water and sanitation, and two for multisector projects.</td>
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<tr>
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<tr>
<td><strong>Local Climate Adaptive Living (LoCAL) Facility</strong></td>
<td>UN Capital Development Fund</td>
<td>LoCAL aims to promote resilient communities and economies by increasing financing for and investment in climate change adaptation at the local level in least developed countries. It is designed to re-enforce existing national and subnational financial and fiscal delivery systems, and it uses the demonstration effect to trigger further flows for local adaptation, including national fiscal transfers and global climate finance for local authorities, through their central governments.</td>
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<tr>
<td><strong>Matchmaker</strong></td>
<td>CDP</td>
<td>Matchmaker is a specialized project dashboard that aims to bridge the divide between cities and potential investors to highlight projects in flood control, waste management, sustainable transportation, renewable energy, water management, and energy-efficiency through project data disclosure and stakeholder consultation. Many of the Matchmaker projects, although not explicitly marked as city projects, occur within an urban setting.</td>
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<tr>
<td><strong>NEPAD Infrastructure Project Preparation Facility</strong></td>
<td>African Development Bank</td>
<td>The NEPAD Infrastructure Project Preparation Facility is a multi-donor special fund, which aims to increase the number of economically, environmentally, socially, and gender-responsive regional infrastructure projects prepared and implemented, to increase funding, and to improve interaction among stakeholders. It supports regional infrastructure development projects in the following sectors: transport, energy, ICT, and water resources management. The activities eligible for financing under the fund are: pre-feasibility studies, feasibility studies, project structuring, capacity building for infrastructure development, and facilitation and creation of an enabling environment for regional infrastructure development.</td>
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<tr>
<td><strong>Subnational Climate Fund Africa</strong></td>
<td>R20, BlueOrchard</td>
<td>The Subnational Climate Fund Africa aims to fund intermediate-sized subnational infrastructure projects in Africa using a dedicated $350 million fund. Based on this approach, the Subnational Climate Fund for Islands and Coastal Regions (SnCF Islands) was launched in May 2018, which is supporting Fiji to foster the development of green infrastructure projects for the Pacific in renewable energy, waste management, and municipal lighting.</td>
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<tr>
<td><strong>Subnational Technical Assistance Program Public-Private Infrastructure Advisory Facility</strong></td>
<td>World Bank</td>
<td>The Subnational Technical Assistance Program funds activities that aim to both establish mechanisms and frameworks that can improve the flow of domestic and foreign capital into infrastructure in a sustainable manner, and create the conditions necessary for these entities to improve their creditworthiness. Building capacity at subnational level and in cities is critical in accessing further investment and finance for city projects.</td>
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<tr>
<td><strong>Sustainable Energy Fund for Africa</strong></td>
<td>African Development Bank</td>
<td>Sustainable Energy Fund for Africa is a multi-donor trust fund to support small and medium-scale renewable energy and energy-efficiency projects in Africa. In many African countries, smaller renewable energy projects are potentially viable from a commercial perspective, but the initial development costs often prevent these projects from accessing necessary financing.</td>
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</table>
Most of the platforms featured here are hosted by international organizations or are financing initiatives by coalitions that support project preparation and pilots. Very few private sector-led initiatives were found. While private initiatives do invest in sustainable urban infrastructure through both debt and equity investments, they do so on a project or instrument-specific basis where most of the deal-level data is confidential, rather than through platforms and initiatives. Many other city-level activity initiatives, especially in emerging markets, occur through international or collaborative platforms captured by broader initiatives, which often rely on support from donors, multilateral development banks, or international financial institutions.

To effectively deliver on the promise of climate-smart cities, it is critical to move from planning to pilots, from pilots to projects, and from projects to partnerships. Investments in climate-smart projects require coordination and leveraged private sector finance to support efforts being made by the public sector. For most cities, achieving this access at scale and at reasonable cost will require sustained and disciplined attention to policies and practices underpinning their creditworthiness. Integrated planning, innovative financing, and collaborative partnerships are some of the approaches cities can adopt to deliver on their desired climate outcomes and community needs. Creating the green, resilient, and technology-based cities of the future offers the opportunity to showcase the role of good public policies and enabling conditions in shaping incentives, attracting private investment, and greening profits. IFC stands ready to support cities on this journey.