

The City Climate-Resilient Infrastructure Financing Initiative (C2IFI)

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Cities are where the battle against climate change will be defined. Cities are responsible for 70 percent of global greenhouse gas emissions, and, by 2050, cities will hold seven out of ten of the world's population, with almost half living in city slums. According to the Global Commission on Economy and Climate, under a low-carbon scenario, [\\$93 trillion needs to be invested worldwide in climate-resilient infrastructure by 2030; 70 percent of this estimate relates to urban areas](#). If cities are to contribute to their countries' abilities to meet the Paris Agreement commitments, they will need to invest a vast amount of money in renewable energy, transportation, water and waste management, green buildings, sustainable public spaces and other climate-resilient initiatives. An important part of these resources must be channeled to develop resilient infrastructure and programs to help cities and its communities cope with challenges like increasingly severe natural disasters and extreme heating events.

Supply of Climate-Resilient Infrastructure Financing

While the supply of financing mechanisms available to cities is increasing, it remains insufficient. Historically, global development finance Institutions (DFIs) in the form of multilateral development banks (MDBs) have been the primary source of infrastructure funding worldwide. In order to fill cities' financing gaps, MDBs and other DFIs (such as bilateral cooperation agencies) are taking important steps to channel directly more funding to them. However, subnational governments still face obstacles in accessing these resources. In several countries, cities are not allowed to access international borrowing directly. In many others, cities are required to obtain a national sovereign guarantee or authorization from legislative bodies to borrow, which pose a great risk since political disputes often impede or delay access to credit.

Public private partnerships (PPP) are another potential source of climate resilient infrastructure funding. However, in many countries, the regulatory frameworks for PPPs are extremely confusing and complex, preventing cities from taking advantage of this type of private investment.

DFIs and other financial institutions are developing specific instruments for climate-resilient infrastructure projects. Green Bonds, in particular, are gaining popularity. Investment in Green Bonds reached \$47.9 billion in the first quarter of 2019, surpassing the first quarter of 2018 volume of \$33.8bn by 42 percent. For 2020, the "credit-rating agency [Moody's predicted a record-setting year for green bonds from the outset](#), but had to revise its projection to \$250bn from \$200bn after growth exceeded expectations". This suggests investors see these instruments as an alluring option. Nevertheless, just like in the case of PPPs, local governments encounter cumbersome conditions on borrowing rights and creditworthiness coming from national law which are required to attract private funding.

Demand for Financing Climate-Resilient Infrastructure

Many cities are setting ambitious goals and undertaking pioneering actions to reduce emissions and contribute to meet the Paris Agreement, as well as to adapt to climate induced risks and impacts. They have gradually started to modernize their policy frameworks, incorporate sustainable social and economic development

planning, build their capacity for developing “bankable” projects and raise their concerns in the international arena. Moreover, due to the pandemic, cities are placing special emphasis on resilience initiatives, including cities’ and their communities’ preparedness and recovery from such different external shocks, as COVID-19.

Clearly, local authorities need to build a stronger business case to secure funding. This is especially true for cities in low-income countries, where the financing realities and capacities differ greatly from those in the developed world. These cities often struggle to fund basic services and have limited fiscal resources to cover infrastructure and operational costs; as a result, lenders often overlook local demand for financing climate-resilient infrastructure. Furthermore, cities’ lack of capacity for project preparation, limited financial knowledge, poor creditworthiness, regulatory uncertainty and corruption impede necessary capital flows.

C2IFI: Helping Demand Meet Supply

During the past few years cities have made progress regarding securing new players and financing opportunities, including new facilities, lines of credit, funds or bonds. However, cities in the developing world do not have access to these financial mechanisms due to the reasons mentioned above. Essentially there is a need to strengthen capacity in cities around financing demand, as well as to foster political and economic inclusiveness for them to access and deploy scale-adequate financing.

In most cases, mayors and city officials --too busy with their daily tasks-- are not even aware of the rapidly-changing developments in the financing landscape. Moreover, the existence of a dissonance between the financiers’ highly technical rationale and language and City Halls’ political or institutional constraints prevents the transition of ideas into “bankable” projects, updated policy frameworks, enhanced social and economic planning and improved financial performance.

Cities struggle to navigate the financial landscape and are unfamiliar with opportunities for project financing or even how to unlock resources available for project proposal preparation. To bridge this gap, the University of Pennsylvania’s Institute for Urban Research (Penn IUR), in partnership with the Wharton School, the Perry World House (Global Affairs) and the Kleinman Center for Energy Policy, are hosting the City Climate-Resilient Infrastructure Financing Initiative ([C2IFI](#)). The Initiative, headed by Professor Eugenie Birch, Co-Director of Penn IUR, and Mauricio Rodas, former Mayor of Quito and PennIUR Fellow, works closely with organizations such as the United Nations Framework Convention on Climate Change (UNFCCC), the World Economic Forum (WEF), the Chicago Council on Global Affairs, the Urban 20 (U20), PwC, and other partners.

C2IFI’s main objective is to address the long-term challenges of cities to tackle climate change and build resilience by improving their accessibility for financing, through supporting municipal capacity building actions in the institutional, policy, regulatory, financial and administrative arenas. While developing these capabilities, cities would be in a better position to become reputable international financing receivers, having the kind of tools needed to access resources in a sustained way over the years to undertake climate-resilient projects and approaches.

C2IFI is developing a network of students, professors and experts from various fields to establish an ongoing mechanism to engage with cities and support cities in their finance efforts, working closely with city officials at different levels, immersing in their reality, understanding their challenges and constructing ways to support them in the process of successfully accessing international financing.

In order to achieve the above-mentioned goals, C2IFI currently focuses on two tasks. They are:

1. **Knowledge Platform:** Working side-by-side with the Cities Climate Finance Leadership Alliance ([CCFLA](#)), C2IFI in building an open source knowledge platform that will enable mayors, city officials and municipal stakeholders to find timely data, partners, financing instruments and best practices within the cities

climate-resilient financing landscape, in a simple and consolidated way. Cities need access to information that speaks their language and helps them understand the players, new models and technical assistance available. The CCFLA plans a soft launch of the hub in June.

2. **Mayors’ Guidance:** Providing mayors with tailored guidance on how to access financing opportunities for climate-resilient infrastructure during all stages of the project’s cycle (the above-mentioned knowledge platform becomes an extremely helpful source). The objective is to support cities in accessing appropriate financing opportunities for specific projects, and at the same time developing capacities that will allow cities to strengthen their long-term abilities to access finance to address climate-related challenges. .

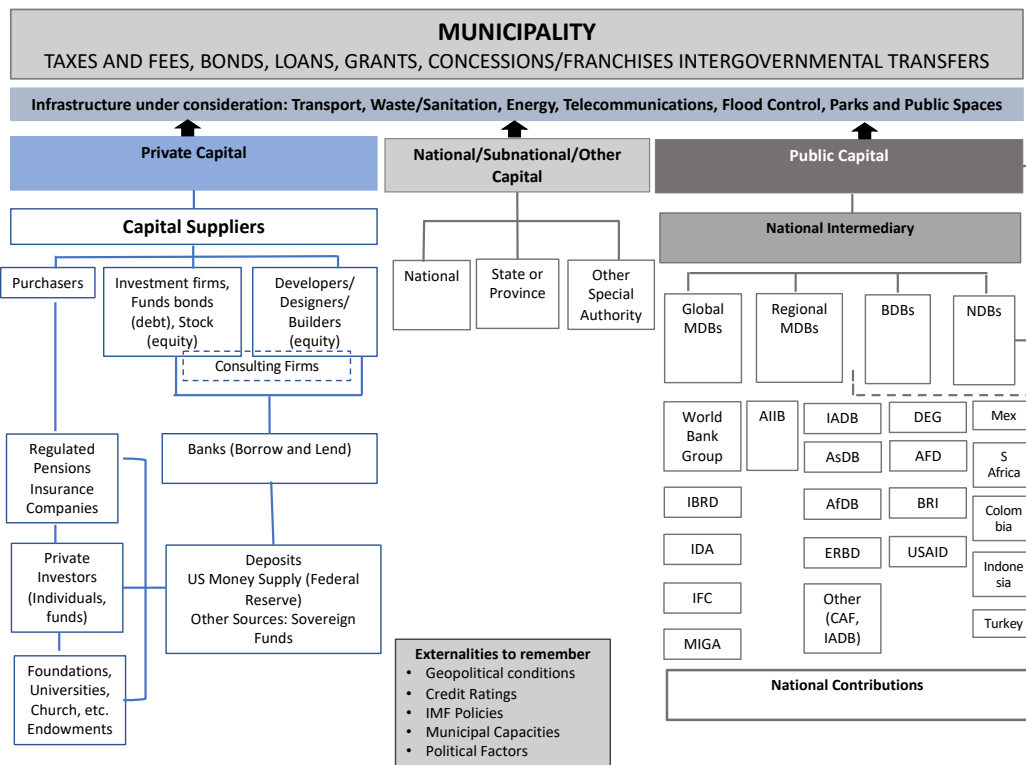
As C2IFI has evolved, Birch and Rodas consulted widely to validate the C2IFI approach, seek ideas and guidance for the work. They interviewed representatives from MDBs (e.g.the World Bank, IFC, IADB), UN agencies (e.g. UNFCC), city networks (e.g. C-40, the Global Covenant of Mayors, UCLG, ICLEI), think tanks (WRI, Brookings, the Chicago Council on Global Affairs), the OECD, the World Economic Forum and the private sector (e.g. PwC, GreenTech). Through them, Penn IUR has become a CCFLA partner.

Further, being aware that C2IFI’s projects take a relatively long time to complete, it will engage different cohorts of students over time who will amplify and update the knowledge platform and apply a common interactive methodology in recurrent Mayors’ Guidance projects.

Knowledge Platform

To support the knowledge platform Birch and Rodas inaugurated a graduate level class on City Climate-Resilient Infrastructure Financing in Fall 2019 for students in Penn’s different schools. They will offer the class annually. For the 2019 version, the students’ delineated today’s climate-resilient financing landscape identifying the range of public and private entities and mechanisms. Later classes will amplify and update this research. See Figure 1.

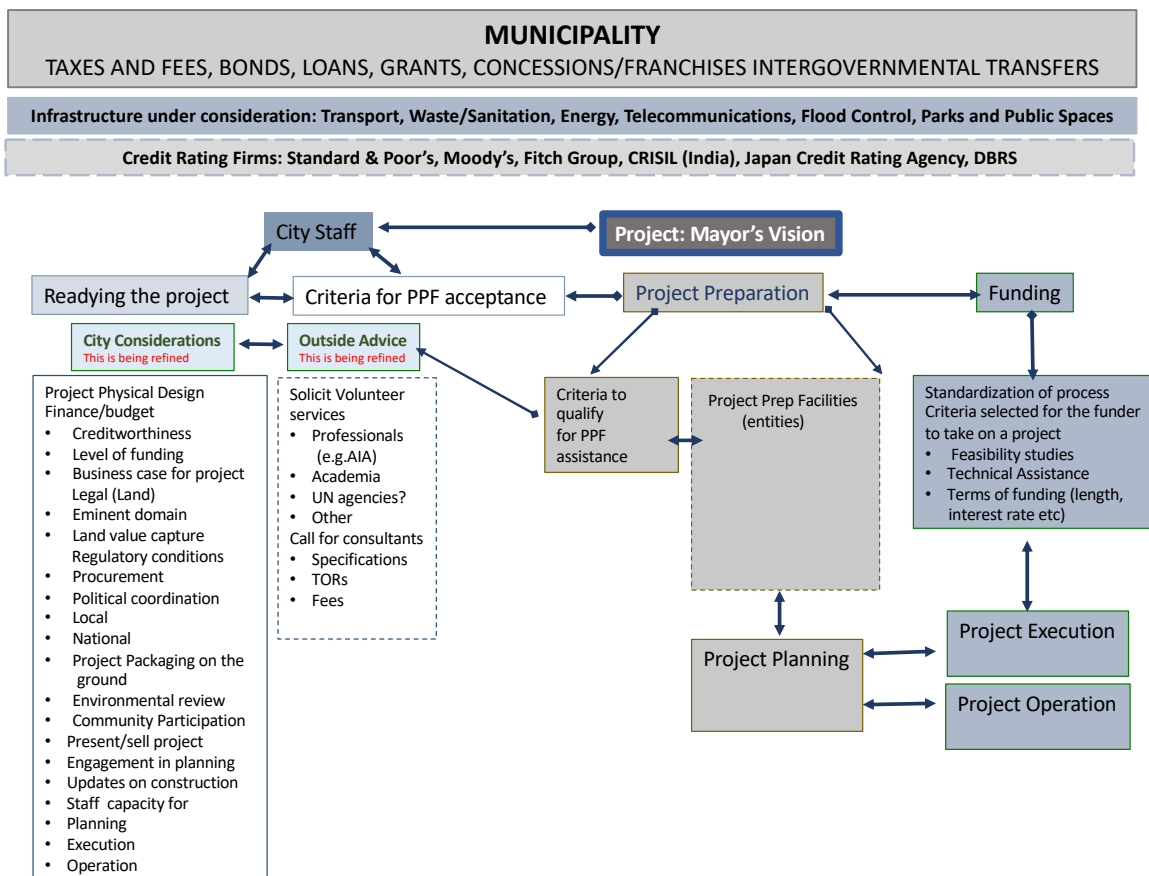
Figure 1. Conceptual Framework: Financial Entities



Mayors' Guidance

In January, Birch and Rodas, working with a research team consisting of students from the class and others, piloted C2IFI' the first Mayors' Guidance project with Yvonne Aki -Sawyer, Mayor of Freetown, Sierra Leone. In March, they began a second project with officials overseeing two urban areas in the Galapagos Islands in Ecuador. This summer, they anticipate starting a third pilot in a different city. The goal is to develop a model to guide cities from different circumstances and realities around the world in how to access finance that will support cities' to address their long-term challenges to tackle climate change and build resilience. See Figure 2.

Figure 2. Mayor's Guidance Process (in development)



Freetown, Sierra Leone

For Freetown, Sierra Leone, the research team is supporting the mayor's efforts to finance a cable-car system to enhance the city's transportation system. They are compiling information on the city's legal and policy frameworks, municipal structure, financial situation, and socio-political and environmental challenges. In addition, they are analyzing Freetown's public transportation system dynamics and the technical and economic characteristics the city foresees for its first cable-car line. In a parallel effort, the team is working on identifying an appropriate project preparation facility (PPF) to finance the project's current stage (between pre-feasibility and feasibility). They are analyzing the multiple PPFs options, assessing their resources and admissions criteria to offer recommendations to the mayor and her staff on which ones to approach. While a suitable PPF for Freetown's cable-car will allow the project to move forward, C2IFI's researchers will continue identifying, along

with city officials, the different financing options available for the later stages of the project, construction and operation. ^[1] In a recent development, the Mayor asked for assistance in seeking funding opportunities to address COVID-19's outbreak and aftermath actions, a request that the team is also pursuing.

Galapagos Islands

The second pilot, the Galapagos Islands, focuses on the islands' urban areas, Puerto Ayora and Puerto Baquerizo Moreno, places that encounter distinctive climate change and resilience challenges and that recently experienced significant economic losses due to the decline in tourism caused by the pandemic. This project aims to support the two villages in their recovery by transitioning to eco-tourism through developing and financing a comprehensive electric vehicle strategy, incorporating electric buses and taxis, electric bikes and electric boats, as well as installing solar charging stations. This project will likely have access to a variety of financing.

The Future of C2IFI

The UN warned that the clock is ticking as we only have ten years left to take effective action and impede irremediable damage from climate change. Despite the efforts made thus far to increase the financial flows for climate-resilient infrastructure in cities, we are falling behind on the needed magnitude and pace. Developing models to scale up support for cities in need of finance is an urgent task. One way to accomplish it is through broad multi-stakeholder partnerships that can engage actors who were not previously part of these efforts. Universities can play a unique role here. They are an endless source of knowledge production, with a rich body of multidisciplinary faculty and experts, as well as thousands of talented, energetic students thirsty for real-life experiences. Such wealth of resources and its potential to become a major drive for the climate change cause, is what inspired the University of Pennsylvania to launch C2IFI.

C2IFI is working on refining its model (based on lessons learned from the pilot projects), with the ambitious goal of expanding its outreach to many cities around the world and building upon the great capacity and resources from Penn. As the Initiative grows larger, we foresee incorporating new partners who will support C2IFIs' goals, while simultaneously increasing the number of schools and students that will guide city officials on how to access climate-resilient financing. Moreover, documenting the experiences from these interactions with cities will become an important engine for best practices exchange and knowledge dissemination. Eventually, more universities can be part of the Initiative, including those in countries where tailor-made assistance is being provided. This model has great scalability and impact potential at a significantly lower cost when compared with similar endeavors undertaken by different types of institutions.

The COVID-19 crisis has triggered the creation of multi-billion-dollar recovery packages from national governments and new lines of credit from different DFIs and MDBs across the world. A consensus is growing to make these investments climate-resilient. Since much of these resources should be disbursed to urban areas because of their relevance to meet with the Paris Agreement, this can become a historic turning point to foster the kind of infrastructure transformation cities and their communities need to cope with the climate change and resilience building challenges.

However, if the increasing supply of financial flows available is not matched with the growing demand capacity from cities and their communities, this can turn into a wasted opportunity. We are living in unprecedented times and now it is more important than ever to support cities, mainly in developing countries, to build institutional, legal and financial capabilities, as well as to guide them on how to access the most suitable financing options to address their long-term challenges to tackle climate change and build resilience. This is the challenging task in which C2IFI is trying to make a lasting contribution.

ⁱ When guiding city officials, every aspect to secure finance flows for the current and later stages of the infrastructure project is taken into account. At the beginning of the pilot, Freetown's city officials explained that a private cable-car manufacturer offered to develop feasibility studies for free. C2IFI advised not to accept the offer, because that would imply sticking to a particular technology for the future construction of the cable car, which would hamper the level of fair competition amongst bidders, eventually deterring MDB's and other IFI's to finance the subsequent phases of the project. This kind of guidance is geared not only to strengthen financing availability, procurement and transparency criteria for the project at hand, but also to consolidate the municipality's institutional practices towards the future.