

Opportunities for private investment in sustainable infrastructure projects in Latin American Cities



EKLA
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en América Latina



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Foreword CDP

CDP is a not-for-profit organization that supports cities, states, regions and businesses in their efforts to reduce their greenhouse gas emissions, safeguard water resources and protect forests. Over the past 18 years we have created a system that has resulted in unparalleled worldwide engagement on environmental issues. We work with over 500 cities, 100 states or regions and 6800 companies around the world - making CDP one of the richest sources of global information on how cities, states, regions and businesses are driving environmental change.

CDP's Cities Program is an essential platform for gathering and sharing urban climate change information. Reporting to CDP's standardized platform works as a self-assessment tool which helps public managers to take actions which will drive cities towards a more resilient and sustainable future.

Due to budgetary limitations, most cities in Latin America struggle to build sustainable infrastructure, however this challenge can be addressed with measures to attract private investment, given the increasing demand from investors for projects of this kind. Urban schemes offer the greatest potential to make a difference in the reduction of emissions, contributing to the population's health and infrastructure resilience with medium and long-term cost reduction. At the same time, green projects in urban areas have the potential to produce a good return on investment - a result of the population density, opportunities for economies of scale and the role that cities play as innovation hubs.

With support from the KAS Foundation, CDP conducted this analysis of private investment opportunities in sustainable infrastructure in Latin America, focusing primarily on Argentina, Bolivia, Chile and Colombia.

The pages that follow will detail the obstacles and opportunities for unlocking private investment in sustainable infrastructure, with the aim of helping to bridge the communication and information gaps that currently exist between cities and investors. It is hoped that the findings of this white-paper can highlight the opportunities presented by the thriving climate finance economy, encouraging public and private leaders to integrate environmental and sustainable criteria into infrastructure planning and investment decision-making.

Lauro Marins

Executive director of CDP Latin America

Foreword KAS

The Konrad-Adenauer-Stiftung (KAS) is a political foundation with 16 regional offices and 2 conference centers in Germany offering a wide variety of conferences and events on civic education. Our overseas offices are responsible for over 200 projects in more than 120 countries. At home and abroad, our civic education programs aim to promote liberty, peace and justice. We focus on democratic consolidation, European unification and the strengthening of transatlantic relations, as well as development cooperation.

For KAS, energy security and climate change management have become important parts of the structure and maintenance of a democratic social order. In this context, the Regional Program for Energy Security and Climate Change in Latin America (EKLA) has been designed as a platform for dialogue, in order to give impetus to the process of political decision-making on these issues.

Naturally, what local governments are able to do can have a huge impact on mitigation actions, considering that more than half the world's population lives in urban areas, that cities consume over 60% of the world's energy and account for more than 70% of global CO₂ emissions. Despite the challenges, climate change represents an opportunity for a new form of development with a focus on environmental sustainability. For an overview of the evolution of climate finance and the demand for green investment projects, we are pleased to present "Opportunities for private investment in sustainable infrastructure projects in Latin American Cities", an analysis developed by CDP Cities based on the responses and opinions of 10 countries in the region. We hope that this report fulfills its objective of strengthening the collaboration between local governments and investors for the sake of better climate action.

Dr. Christian Hübner
Head of EKLA - KAS

Executive summary

Climate change represents an opportunity for the economic transformation of infrastructure through the generation of financial instruments and business models in line with environmental and sustainable development criteria.

Integrating these criteria into infrastructure planning and investment decision-making is crucial because there will be significant changes in climate during the life time of the infrastructure. Melting glaciers, intense storms and other climate-related phenomena are expected to increase pressure on Latin America's infrastructure. Turning infrastructure greener and more resilient could also help reduce inequality, lift people out of poverty and promote development (World Bank, 2017).

There is an opportunity to tackle the current gaps in infrastructure in Latin America by integrating climate resilience into planning, and there are new and diversified sources of capital that can be channeled for this purpose.

An assessment of the current international flows of capital reveals that climate finance represents a market of US\$714 billion. In 2009, developed countries committed to mobilizing US\$100 billion per year by 2020 from public and private sources, and agreed to set new, higher financial targets by 2025 (UNFCCC 2015: Decision 1/CP.21, paragraphs 114 and 53). More recently, additional capital allocation has been announced as the World Bank unveiled \$200 billion in climate action investment for 2021-25, adding these amounts to the doubling of its current five-year funding (AFP, 2018).

With the aim of identifying the main

opportunities as well as the obstacles to attracting private capital to green infrastructure projects in cities in Latin America, CDP prepared this white-paper with support from the KAS Foundation.

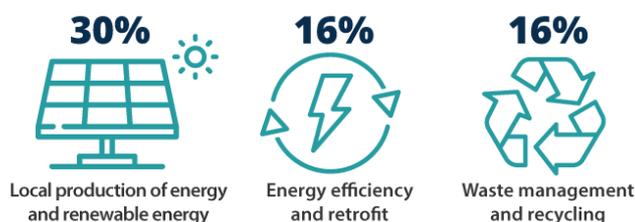
This paper includes an extensive review of current studies, as well as responses to the CDP Cities questionnaire on climate change provided by 184 municipal governments in Latin America in 2018. This data, which includes megacities such as Buenos Aires, Bogota, Mexico City and Lima, as well as other small and medium-sized cities, provides insights into the demand for financing for sustainable infrastructure projects within the cities, as well as the obstacles to obtaining such funding.

It was also possible to analyze additional information from 86 cities that responded to a survey with specific questions about the green infrastructure projects for which they are seeking investment. In addition, it includes data from a survey sent to 600 investors from the CDP and United Nations Environment Programme Finance Initiative (UNEP-FI) network, which aimed to identify and qualify the demand for investment in sustainable infrastructure in Latin American cities. Based on the analysis of this diversified data, we also make some recommendations for overcoming the current obstacles to attracting large-scale private capital to sustainable infrastructure projects.

Our survey with investors confirmed that there is a demand for investment by the private sector in sustainable infrastructure projects in Latin America; 48% of the respondents indicated that they are currently

investing in sustainable infrastructure projects in Latin American cities, while another 19% said they intend to invest. Only 34% of the respondents are non-Latin American investors, which also confirms some interest of international investors in green infrastructure projects in the region.

Local production of energy and renewable energy were the project topics of greatest interest cited by investors (30%), followed by energy efficiency and retrofit (16%) and waste management and recycling (16%).



Our cities survey in Latin America revealed that the main obstacles to accessing this capital include a diversity of issues, from management changes to lack of political support for green projects. Latin American cities also highlighted the difficulty of fulfilling the requirements of private investors.

According to the survey with Latin American cities, the mechanisms most used by cities to finance their climate projects are multilateral and bilateral grants, which are non-repayable funds generally directed towards non-economic activities. Concessional and non-concessional loans are also common, mainly provided by Development Financial Institutions through project finance. Private financial institutions also participate in Project Finance through insurance instruments, as well as guarantees often related to the management risks of default and also climate related investment or even of natural disasters. These guarantees can be made by governments to mitigate risks and to attract

investment for a public project/policy, or ensured by a financial institution through completion bonds for Project Finance projects, for example.

PPPs are increasingly common in the region, although schemes between the private sector and cities are less common. PPPs can link players in the private sector and encourage them to develop public infrastructure and to provide strategies that will mobilize financial and technological resources at the required scale.

The issue of bonds for climate related projects is another promising option due to its flexibility and the potential to mobilize long-term capital from more diverse sources, such as pension funds, hedge funds, governments and other investors.

We identified bonds issued by Latin American Commercial Banks that can also benefit sustainable urban infrastructure, since the resources are focused on projects such as renewable energy and energy efficiency, as well as clean transport, sustainable land use, water resources management, sustainable constructions and biodiversity conservation.

Some cities in Latin America are legally allowed to issue bonds. Examples of cities in the region that have succeeded in issuing bonds since 2007, including non-label-led ones, are in countries with investment-grade credit ratings, such as Mexico and Colombia. The potential for greening existing bond issuance in these countries is therefore particularly great.

If cities are unable to issue their own green bonds, options include leveraging the green bonds 'use of proceeds' model by partnering with other private sector entities such as commercial banks or corporations

The interviews with financial and infrastructure experts also revealed that

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creating this enabling environment for mobilizing private capital for sustainable infrastructure projects requires strategies of securitization and de-risking. Development Banks have a crucial role to play in securitization, and along with financial ministries and departments, should act on de-risking strategies to redirect investment from the private sector to green investment.

The findings of this research indicate that Colombia is the Latin American country with the most favorable environment for private investment in sustainable infrastructure, combining innovative Public Private Partnerships (PPPs) policy frameworks, positive macroeconomic indicators (see annex 1), as well as a financial community that is taking actions towards socially responsible investment. As an example, Colombian financial institutions pioneered the issuance of green bonds, financial resources which are being channeled into green projects that include sustainable infrastructure.

Nevertheless, we have highlighted the opportunities presented by the region as a whole, summarizing the most relevant information regarding the regulatory and economic situation in the five countries included in this research in the final section on case studies.

In the five countries studied subnational governments are allowed to issue bonds, although this is not a common practice due to the poor credit worthiness of many cities. The following pages will give details of some of the opportunities and set out some strategies for overcoming the existing obstacles to attracting private investment.



Review of Literature



2.1 The case for investment in sustainable infrastructure

Since their emergence more than 5000 years ago, cities have been centers of knowledge and innovation, but it is only in the last 250 years, with the phenomenon of urbanization, that they have assumed the characteristics of the modern cities that we know today. Following the Industrial Revolution, the first wave of urbanization was accompanied by technological innovation based on the intensive use of fossil fuels, which accelerated extreme weather events and pollution. By the 1950s, more than 50% of the population in the more developed regions (Europe, Japan and The United States) lived in large cities. The second wave of urbanization is now occurring in developing countries with much greater speed (Mills et al., 2010).

More than half the world's population now lives in urban areas. In Latin America and the Caribbean, 80% of the population lives in cities, and projections indicate that by 2025 this figure will be 83%, and by 2050, 88% (UN, 2014).

Over 70% of the total demand for infrastructure over the next 15 years is expected to be in urban areas, which means that how cities develop is important for both growth and for climate change. The Sustainable Development Goals recognize the importance of future urban development for achieving sustainability goals, specifically in setting Goal 11 to make cities inclusive, safe, resilient and sustainable.

Given the speed of urbanization and long-lasting nature of urban infrastructure, the decisions made today by national and city policy makers, as well as companies and investors, will determine our financial and climatic security for the second half of the century. Infrastructure has a profound impact on climate goals, with the existing stock and use of infrastructure associated with more than 60% of the world's greenhouse gas (GHG) emissions. Thus, the decisions regarding investment in urban infrastructure taken over

just the next five years will determine up to a third of remaining global carbon budget to limit the global rise in temperature to under 2°C, which aims to avoid dangerous climate change that could drive the global economy to a financial and humanitarian crisis on an unprecedented scale. (Global Commission on the Economy and Climate, 2016).

However, only 1 in every 10 dollars of total climate finance was allocated to cities between 2010 and 2014 (Barnard, 2015). An estimated US\$57 trillion of investment is needed to finance global infrastructure requirements. Furthermore, US\$93 trillion of investment is required in low-carbon infrastructure and activities over the next 15 years, in order to limit the global temperature increase to less than two degrees Celsius (Gold Standard, 2015).

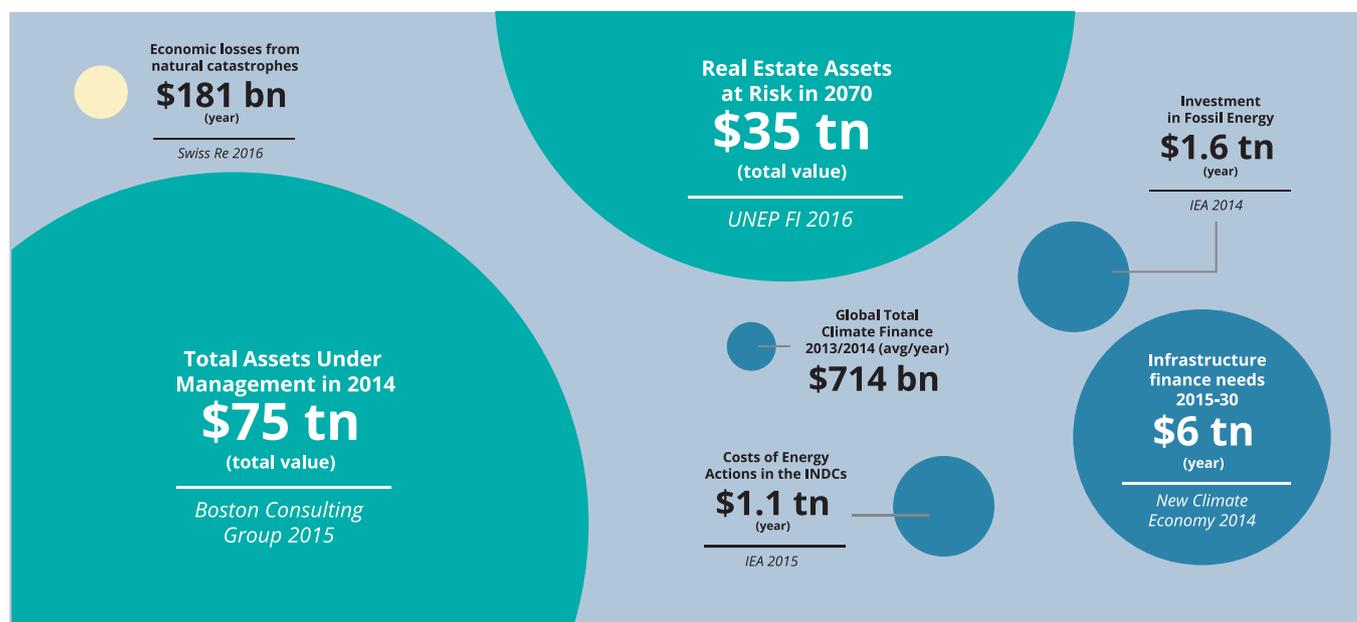
An assessment of the current international flows of capital reveals that climate finance represents a market of US\$714 billion

(*Figure 1*). Obstacles to releasing more capital for sustainable infrastructure include a lack of institutional capacity that would enable subnational governments to develop bankable projects. Increased transparency and governance are also crucial to advancing public-private partnerships in order to shift investment to reverse climate change and drive economies to a sustainable future, securing financial and climatic stability (De Bouer, 2015).

According to the Standing Committee on Finance of the United Nations Framework Convention on Climate Change - UNFCCC - total global climate finance has increased by almost 15%, from US\$650 billion in 2011 to US\$741 billion in 2014. The private sector accounts for more than 60% of global climate finance, investment mostly driven by renewable energy and energy efficiency, an already consolidated market, which thus requires less public support to further mobilize private capital.

However, most of the investment coming from private capital is in fact in the form of grants

Figure 1: Global flows of capital



Source: Adapted from UNFCCC, 2016

from Development Financial Institutions and Multilateral Financial Institutions. Therefore, regular public investment continues to provide the foundation for private investment year after year.

The flow of global climate finance monitored on an annual basis include: (1) public and private investments in renewable energy; (2) international climate finance provided by governments and public entities (including multilateral and bilateral Development Financial Institutions [DFIs] and climate funds); and (3) climate finance provided by a number of national DFIs. These investments include grants, concessional loans and non-concessional loans from the public sector, as well as market rate investments. The volume of financing reflects the total value of primary financial transactions and investment costs of adaptation and mitigation measures (e.g. the total cost of a wind turbine) and, where this information is specified, activities that directly contribute to adaptation and/or mitigation, plus public framework expenditures (CPI, 2017).

Estimates related to the flow of global climate

finance do not include policy-induced revenues or other public subsidies (e.g. feed-in tariffs and fiscal incentives), secondary market transactions (e.g. mergers and acquisitions) or risk management instruments (e.g. guarantees). The estimates draw on data from numerous sources, including reports from the Development Assistance Committee of Organization for Economic Co-operation and Development (OECD-DAC), Multilateral Development Banks (MDBs), and the International Development Finance Club (IDFC), in an effort to make figures consistent and to avoid double counting.

Part of the solution to unlocking climate finance may be a shift from existing investments in traditional fossil fuel activities to climate compatible activities. The total upstream and downstream fossil fuel investment in 2016 of \$825 billion indicates that potentially significant stranded investments could be reallocated to meet low-carbon investment needs (IEA 2017a).

Carbon markets can also play an important role in boosting finance for green and climate resilient infrastructure as they show a clear

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signal of the price of emissions to economic agents and generate new revenue sources through a whole new trade environment, by setting limits on emissions and allowing innovation in carbon and emissions trading, emissions allowances, carbon offsets etc (Neves and Prata, 2018).

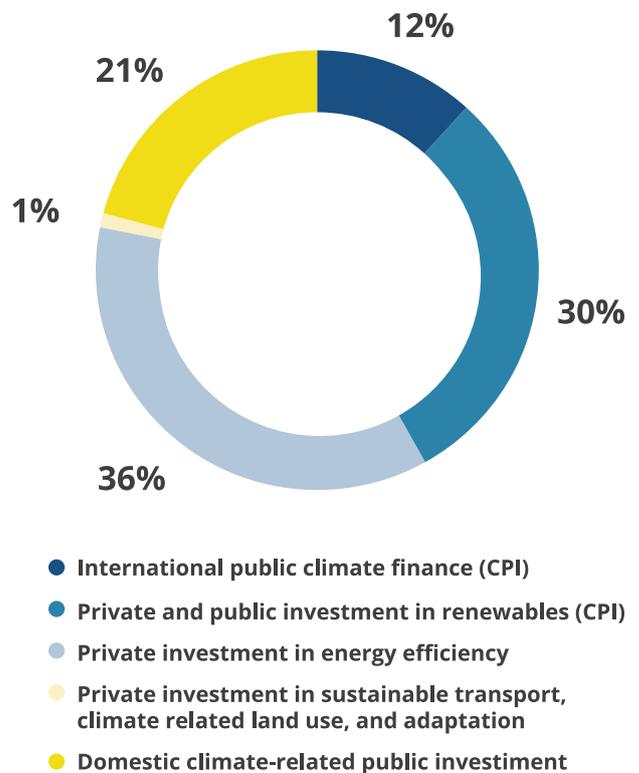
Cities play a crucial role in this shifting of investment from carbon intense activities to clean technologies (such as sustainable infrastructure) due to their density and large economies that enable costs to be reduced and benefits in carbon reductions to be increased (UNEP, 2014).

The global network of cities participating in CDP initiatives in 2017 represents a portfolio of city climate projects of US\$57.89 billion for investors. These projects are mapped using the Matchmaker platform, launched in 2016 with the support of Climate-KIC, aiming to better position cities to attract financing for their climate-related projects. The platform bridges the communication gap between cities with infrastructure projects that need financing and members of the financial community seeking climate-related investment opportunities. Cities with climate-related projects requiring investment are identified through their responses to the CDP Cities Questionnaire.

Portfolio of city climate projects

**US\$57
billion**
for investors

Figure 2: Breakdown of total global climate finance



Source: Adapted from UNFCCC, 2016

2.2 Climate Finance

Over the course of international climate negotiations in recent years, countries have committed resources to financing the mitigation of, and adaptation to, climate change. In accordance with the principle of “common but differentiated responsibilities and respective capabilities”, the United Nations Framework Convention on Climate Change - UNFCCC - stipulates that developed countries shall “provide new and additional financial resources” to support developing countries to achieve their commitments/goals/reach their targets. Although there is no single definition of climate finance, the UNFCCC describes it as “finance that aims to reduce emissions, to enhance sinks of greenhouse gases, to reduce vulnerability and to increase the resilience of human and ecological systems to the negative impacts of climate change.” (UNFCCC, 2014).

This set of resources includes mainly public but also private resources directed towards limiting the global temperature rise to under 2°C. The main goal of climate finance is to increase the effectiveness and fairness of the global response to climate change, assisting developing countries to make the transition to low carbon societies, and supporting the most vulnerable nations in their adaptation efforts (Pickering, Betzold and Skogaard, 2017).

The flow of climate finance reached a record high of US\$437 billion in 2015, followed by a 12% drop in 2016 to US\$383 billion, although this was still higher than in 2012 and 2013. Taking into account annual fluctuations, the average flows during 2015/2016 were 12% higher than during 2013/2014 (CPI, 2017).

According to the Climate Policy Initiative, in 2015 and 2016 public finance actors/investors and intermediaries committed an average of US\$139 billion/year, or 34% of the total climate finance. Private climate finance reached an average of \$270 billion per year during 2015 and 2016, which was 23% higher than the previous period (2013 and 2014). A record high of US\$299 billion was recorded in 2015, followed by a 19% decline in 2016, although 2016 was still higher than the years prior to 2015.

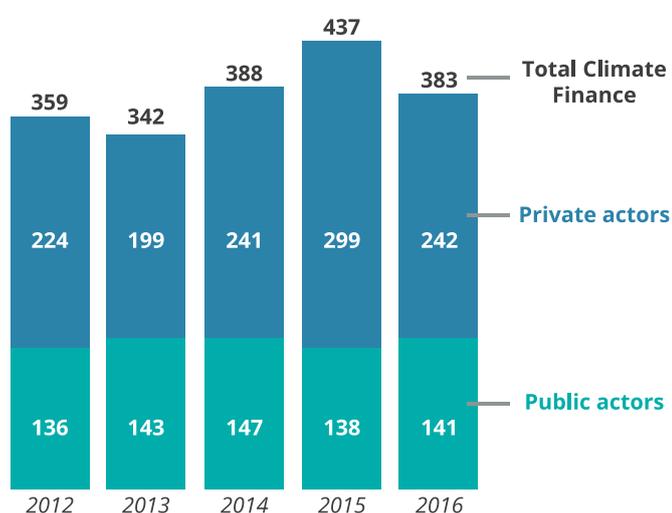
According to the Global Landscape of Climate Finance 2017, private finance flows include financial commitments made by corporations and developers implementing new renewable energy projects, as well as project loans from commercial banks, direct infrastructure investment by institutional investors, and households investing savings.

Project developers account for the largest proportion of private finance, with US\$148 billion invested in 2015 and US\$125 billion in 2016. Corporations and households consistently account for 10% to 15% of total private finance. Commercial financial institutions have also assumed a larger role. The share of more traditional lenders in the climate financing mix signals a maturing technology market in some areas.

The Climate Policy Initiative's report analyses data at project-level, focusing on primary financing specifically directed at climate-specific outcomes, and excludes activities that are more typical for institutional investors, such as re-financing or investments in project developers. However, this exclusion did not minimize the role of institutional investors, exemplified by the fact that the report capture increased direct investments in climate finance from institutional investors and infrastructure funds by \$2 billion.

According to the "Common Principles for Climate Mitigation Finance Tracking", the list of activities that can be funded through climate finance includes: renewable energy, generation of low carbon energy (that uses fewer fossil fuels and more alternative sources) and energy efficiency. Another additional group of activities consider planted forests and land use, energy efficient agriculture, water/waste treatment. Transport, low carbon technologies, as well as emissions reductions not related to energy such as clean industrial production and the capture and storage of carbon can be also receive funds through climate finance. And finally transversal

Figure 3: Breakdown of global climate finance by public and private actors 2012-2016 (US\$bn)

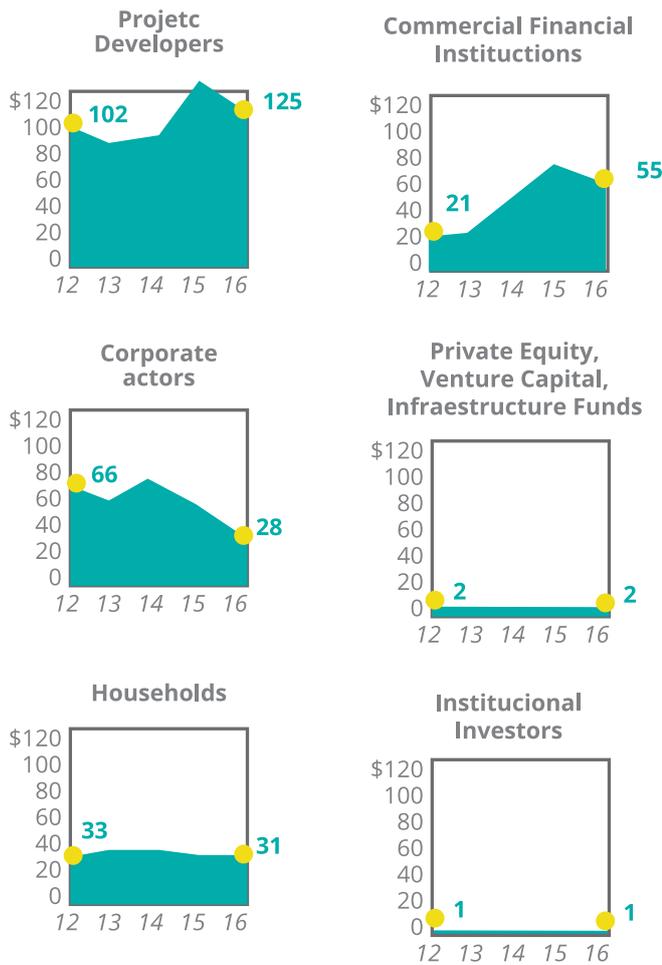


Source: Adapted from CPI, 2017

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themes such as the support and development of carbon markets, policies and regulations, as well as systems for monitoring emissions (World Bank, 2015).

Figure 4: Sources and intermediaries of private climate finance



Source: Adapted from CPI, 2017

2.3 Green and climate resilient infrastructure

Studies to determine finance flows have shown that sustainable infrastructure is one of the main niches in the area of climate finance sector (Clark, Reed and Sunderland, 2018). There are many definitions of sustainable infrastructure, so for the purposes of this paper we have adopted

the concept that includes both traditional types of infrastructure from energy to public transport, water supply and sanitation, as they can reduce emissions and/or increase resilience to climate change. This concept also includes natural infrastructure such as forest landscapes, wetlands and watershed protection (Global Commission on the Economy and Climate, 2016). Complementary to this understanding, green infrastructure can be also defined by natural and semi-natural systems which can provide additional benefits when compared to traditional grey infrastructure (TNC, 2013).

In effect, investing in green infrastructure is a way to overcome **three different challenges in one go: boost growth, thus delivering the Sustainable Development Goals and reducing the risk of dangerous climate change**. Investment of around US\$90 trillion is needed in the next 15 years, which is more than the value of all existing infrastructure. Two thirds of global infrastructure investment is needed in the Southern Hemisphere, where most infrastructure is new and there is an opportunity to “leapfrog” the sprawling and polluted systems of the past. (Global Commission on the Economy and Climate, 2016).

Indeed, this was one of the conclusions reached by The New Climate Economy, a project commissioned by the governments of Colombia, Ethiopia, Indonesia, Norway, South Korea, Sweden and the United Kingdom for The Global Commission on the Economy and Climate.

Experts from The New Climate Economy project also warned that the window of opportunity for this investment shift is narrow, that it is crucial there be a fundamental change of direction in the years between now and 2020. They emphasized that: “We can build cities where we can move, breathe and be productive, we can foster

ecosystems that are robust and resilient, and we can avoid the potential displacement of millions of people". In their view, the time to act is now, due to record low interest rates, large available pools of finance and rapid technological change.

The sense of urgency to integrate risks and opportunities associated with climate change into the decision making process was the main motivation for leaders from the financial sector to take action through the Task Force on Climate-Related Financial Disclosures, led by the Financial Stability Board, an international body that monitors and makes recommendations about the global financial system. The Task Force has 32 members, including large banks, insurance companies, asset managers, pension funds, accounting and consulting firms, and credit rating agencies, all selected by the Financial Stability Board.

The TCFD represents an important milestone, as both the financial and environmental communities reached a consensus about the threats of global warming and the urgent need to manage and price climate-related risks and opportunities.

The 2017 TCFD report highlights infrastructure as an area of great potential for the financial sector, both in terms of market and resilience; opportunities such as access to new assets and locations needing insurance coverage, resulting for example in an increased diversification of assets with green bonds and infrastructure.

In terms of building resilience in the financial sector, the TCFD recommends participation in renewable energy programs and the adoption of energy efficiency measures, an area with great potential for collaboration with the public sector - for diversification of financial assets with green bonds and increased market valuation

through resilience planning for example, as well as increased revenue through new products and services related to ensuring resiliency.

Another interesting movement comes from institutional investors making commitments of divesting in high intense assets, as evidenced by the Portfolio Decarbonization Coalition (PDC), a multi-stakeholder initiative that will drive a reduction in GHG emissions on the ground by mobilizing a critical mass of institutional investors committed to gradually decarbonizing their portfolios. A joint initiative of the UNEP-FI and the CDP, the PDC comprises 32 investors overseeing the decarbonization of US\$800bn in commitment.

To complement this effort, Montreal Pledge, an initiative led by Principles for Responsible Investment (PRI) (also supported by the PDC), has reached more than US\$10 trillion in assets under management, with over 120 investors committed to measuring and publicly disclosing the carbon footprint of their investment portfolios on an annual basis.

2.4 Main obstacles to overcome

According to the Outlook of Climate Finance 2017, part of this increase in climate finance may be based on a shift of existing investments from traditional fossil fuel activities to climate-compatible activities. The total upstream and downstream fossil fuel investment of US\$825 billion in 2016 is an indication of the significant potential of this transition (CPI, 2017).

Projects related to green and climate resilient infrastructure could be the main focus of this shift in capital. However, there are obstacles that should be addressed in order to attract private investment in these projects, including the lack of capacity or knowledge to develop and report bankable projects that are competitive with non-mitigation projects in terms of attracting finance; the lack of a mandate from the electorate, or

even awareness that climate mitigation projects can reduce and avoid costs, resulting in little political will in the city to drive forward the climate change agenda.

The New Climate Economy report also highlights four impediments that should be addressed in order to raise the quantity and the quality of investment in infrastructure. The first is tackling fundamental price distortions, such as subsidies for fossil fuels and carbon intensive assets, as well as providing further incentives for innovation that could for example reduce pollution and congestion, or even generate revenue that could be redirected to alleviate poverty/benefit the poor. Secondly, strengthening policy frameworks and institutional capacities, thus improving conditions for investment. Thirdly, transforming the financial system to allow for the scale and quality of investment required, as well as increasing investments in clean technology R&D and deployment in order to reduce the costs and enhance the accessibility of sustainable technologies.

Additional obstacles include difficulties in defining standards, a lack of transparency and accountability, the low frequency of monitoring, tracking and evaluation processes, as well as overlapping and double accounting.

Experts argue that some of these barriers can be overcome by current technologies such as Blockchain, “that relies on cryptography to maintain a continuously growing database of records, protecting all the registered information from being tampered with, even by their operators” (Neves and Prata, 2018). According to the authors, there are no intermediaries responsible for ensuring the integrity or the trustworthiness of the data, as it is regulated voluntarily by users using the software. These features of Blockchain represent advances in areas such as transparency promotion, security and accountability, reducing fraud and corruption, as well as enhancing traceability.

2.5 Forms of private investment in infrastructure

Experts recommend an investment in infrastructure of 5% of GDP in Latin America. However, due to budgetary constraints and the limited capacity of the public sector to develop infrastructure systems, the average rate is in fact much lower than this recommendation (Ruiz, Arboleda and Botero, 2016). The authors argue in favour of a new model combining climate finance, capital markets and Public-Private Partnerships (PPPs), in order to catalyze investment in sustainable infrastructure for the benefit of the community. The creation of a new business model for developing sustainable infrastructure therefore provides an opportunity to establish a market for climate derivatives.

This investment in infrastructure can be channelled from international climate finance, although access to capital might be difficult by the fragmented nature of this system due to its global climate governance across many international and national institutions, rather than strongly centralized at the multilateral level (Pickering, Betzold and Jakob Skovgaard, 2017).

The climate finance ecosystem includes several players, such as Multilateral Development Banks, Development Finance Institutions, Climate Bonds, Multilateral and Bilateral Funds and National Funds, among others. Currently, one of the main climate finance vehicles/sources consist on Multilateral Trust Funds, which represent the largest number of resources mobilized through intergovernmental processes. The major climate related Multilateral Funds are: A) The Global Environment Facility (GEF), created at the 1992 Rio Summit to support developing countries in meeting goals defined by the international environmental treaties. B) The Climate Investment Funds (CIFs), created by multilateral banks such as The World Bank, which include two types of funds both for developing countries: The Clean Technology Fund, which finances projects related to low

carbon technologies such as clean transport, renewable energy and energy efficiency, and the Strategy Climate Fund, encompassing climate resilience, scaling up renewable energy and forestry management. C) The Green Climate Fund (GCF). (Neves and Prata, 2018).

According to the authors (Transparency International, 2017), the main financial instruments are: A) Multilateral and bilateral grants, which are non-repayable funds that are generally directed to non-economic activities, B) Concessional and non-concessional loans, mainly provided by the private sector and developmental financial institutions; C) Insurance instruments, often related to the management risks of climate related investment or even of natural disasters, and D) Guarantees made by governments to mitigate risks and to attract investment for a public project or policy.

However, climate finance is not limited to these traditional sources. Equity funds, for example, represent an option for smaller projects that are usually not eligible for traditional climate funds. In addition, equity funds enable more diversified investments covering a broader range of asset classes. Eco-Enterprises and Davos Timberland are examples of equity climate funds. The issue of bonds for climate related projects is another promising option due to its flexibility and the potential to mobilize long-term capital from more diverse sources, such as pension funds, hedge funds, governments and other investors. Climate bonds already represent a market of US\$389 billion. Although the scope of climate aligned bonds is much larger: US\$1.4 trillion, including aligned outstanding bonds, in other words, taking into account the assets that have features to be issued as climate bonds, but have not yet been issued (Climate Bonds Initiative, 2018).

Sustainable infrastructure projects can attract financial resources from various private investors, such as pension funds, multilateral banks and investment funds that are dedicated

to encouraging the development of sustainable projects. According to Ruiz, Arboleda and Botero (2016), showing a satisfactory risk x return ratio should not be a problem as the majority of empirical evidence in the literature shows a positive correlation between infrastructure investment and economic growth. For this reason, it is crucial to connect the creation of infrastructure and economic growth with sustainable development.

According to the authors, climate change represents an opportunity for the economic transformation of infrastructure through the generation of financial instruments and business models in line with sustainable development criteria. This shift in investment can be achieved by creating new market rules aiming to establish a long-term vision that at the same time can help to reduce greenhouse gas emissions and improve the quality of life. PPP schemes that link players in the private sector and encourage/motivate them to develop public infrastructure and to provide financial strategies is a way to mobilize financial and technological resources at the required scale.

Subnational and local governments have been raising revenue independently and have, in a number of instances, successfully issued infrastructure or green bonds. In this case the main actors are typically those in the public sector, e.g. public corporations or state/municipal utilities. Public revenues may also be used to fund private concessions as infrastructure operators or other private entities – for example, using procurement mechanisms or PPPs.

Green bonds can be an essential source of finance for cities in developing countries to invest in low-carbon, climate-resilient infrastructure to meet the water, energy, housing, and transportation demands of their expanding urban populations. However, currently fewer than 20% of cities in developing countries can issue bonds to local investors, and only 4% are creditworthy enough to

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access international capital markets (CPI, 2016).

In recent years, green bonds issued by Development Finance Institutions (DFIs) like the World Bank or the Asian Development Bank have been mobilizing capital for projects in developing cities – such as for mass transit systems, district heating, and water distribution networks – all of which were funded indirectly from green bonds. Nowadays, cities also have third-party options such as commercial banks and corporations (like energy utilities), which are flooding into the green bond market.

Some cities in Latin America that are legally allowed to issue bonds may follow the lead of 35 municipal or city governments in the US, Europe and South Africa by issuing their own green bonds. In the cities or regions in 16 developing countries that have issued non-label-led bonds since 2007, five are in countries with investment-grade credit

ratings, Mexico and Colombia among them. The potential for greening existing bond issuance in these countries is therefore particularly high (Bloomberg, 2016).

Reasons to adopt a long-term goal to attract capital to green city-based projects:

- Supporting improvements in cities' creditworthiness by increasing transparent uses of finance through reporting requirements and internal administrative coordination between city departments.
- Aligning city-based projects with the green bond frameworks of issuers can ensure that urban infrastructure follows national or international green performance requirements.
- Visibility among international and domestic investor communities with regard to how cities are sustainably urbanizing can support broader investment flows and increase/strengthen trust in city planning and management.
- Using city-specific green bond reporting metrics in the form of improving health, air quality and social conditions can make investment in specific projects more attractive, particularly for investors looking to make the most environmental and social impact.

Figure 5: Breakdown of green bond market flows from

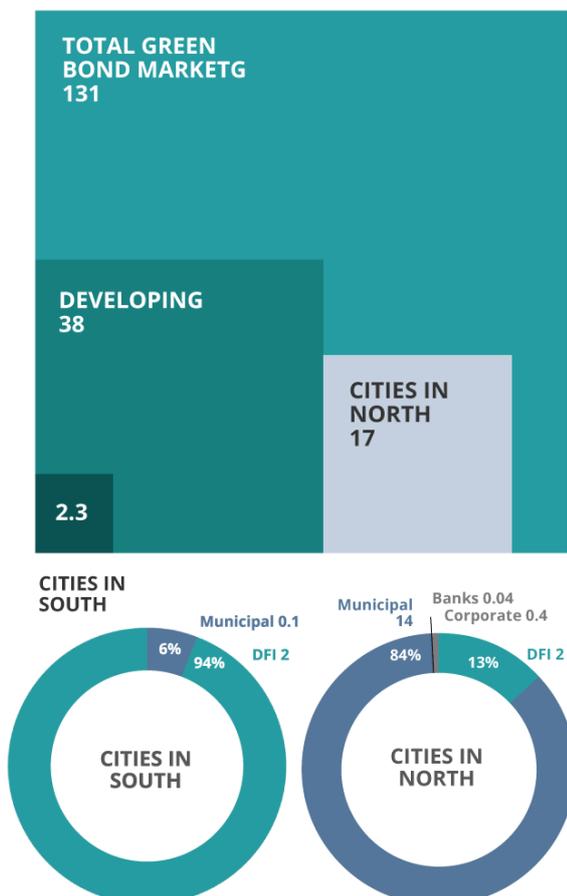
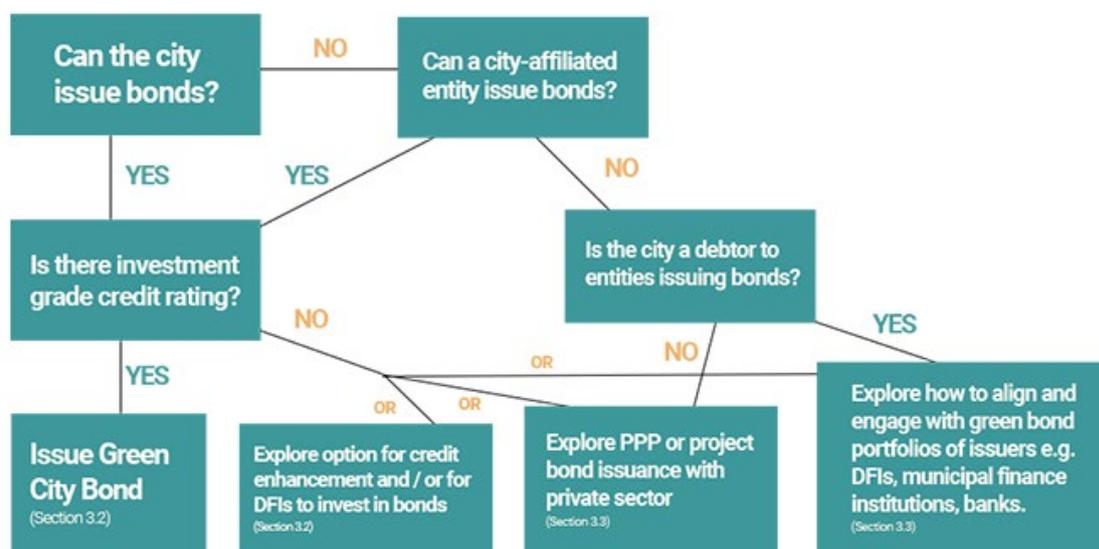


Figure 6: Decision tree to develop green bond market access strategy



Source: CPI, 2016

cornerstone investors to facilitate demonstration (CPI, 2016).

If cities are unable to issue their own green bonds, options include leveraging the green bonds 'use of proceeds' model by partnering with other bond market participants in support of green city-based projects and investment plans such as: A) City-affiliated agencies or entities; B) National development agencies or banks, C) Private sector entities such as commercial banks or corporations, D) Multilateral development agencies or banks.

According to the CPI guide, regardless of which options are selected in the short-term, they should support longer-term goals by increasing awareness of cities' green investment plans among domestic and international investment communities.

Project Finance

Project finance uses a limited-recourse financial structure (a separate entity, often called a "special purpose vehicle" or SPV) to borrow money for a project, and relies on the cash flow generated by the project to pay back the debt and equity used to finance it. The project is a self-standing entity that can then be a vehicle to keep project debt off company or other investor balance sheets.

For infrastructure projects, both corporate and project finance rely largely on debt financing through syndicated bank loans (see below). In all instances, cost recovery is key to making a project bankable, and creditworthiness will make or break access to debt financing.

Equities

Corporate bonds and new equity are also part of private finance, but are less common in the area of infrastructure. Equity has particular potential to play a larger role in financing the early phases of projects, with utility companies, developers, commercial banks and other private investor groups driving decisions on infrastructure investment.

Commercial banks, individuals and households, philanthropies and impact investors can also provide project finance. Alternative equity finance forms such as crowdfunding are also beginning to emerge, allowing small contributions from a large number of individuals, often using internet-mediated registries, to be channelled to projects that require large investments. In the UK for example, more than £10 million (US\$13 million) has been raised and subsequently invested in 14 different energy projects, with two of its largest projects being funded by 650 investors each (Global Commission on the Economy and Climate, 2016).

PPP

A Public-Private Partnership (PPP) is “a long-term contract between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and remuneration is linked to performance”. (World Bank, 2017).

PPPs as a financial instrument resulted from Project Finance (PF) schemes and established mechanisms for the private sector to participate in the development of public infrastructure, and to maintain and operate existing infrastructure (Ruiz, Arboleda and Botero, 2016).

PPPs for infrastructure projects can involve private sector participation at all stages of project development and operation –the development, financing, construction, operation, maintenance, transfer, deconstruction or re-designation of public infrastructure (Kennedy and Corfee-Morlot, 2012).

Syndicated bank loans

A loan offered by a group of lenders – referred to as a syndicate – who work together to provide funds for a single borrower that could be a corporation, a large project or a sovereignty, such as a government. The loan can involve a fixed amount of funds, a credit line or a combination of the two.

This is the preferred instrument of private infrastructure finance because it allows for closer monitoring by banks with sector or other specialized expertise. This can be particularly critical during the more complex, riskier first steps of project planning and construction, when greater flexibility and time-bound interventions are needed, such as gradual disbursement of funds, or renegotiation and restructuring of loans in response to unforeseen developments (Global Commission on the Economy and Climate, 2016).

Green bonds

A bond is a form of debt security that is a legal contract for money owed that can be bought and sold between parties. A green bond is a debt security that is issued to raise capital specifically to support climate related or environmental projects.

This specific use of the funds raised — to support the financing of specific projects — distinguishes green bonds from regular bonds. Thus, in addition to evaluating the standard financial characteristics (such as maturity, coupon, price and credit quality of the issuer), investors also assess the specific environmental purpose of the projects that the bonds intend to support (World Bank, 2015).

2.6 The role of governments and policy

While finance remains far below the estimates of what is actually required, the 2017 Global Landscape of Climate Finance of CPI highlights several positive trends that may improve the outlook for scaling up climate finance in the future. Opportunities include: A) National Determined Contributions (NDCs) plans being elaborated to provide clarity with regard to potential investment opportunities; B) Greening existing public finance flows; C) Industry-wide discussions on the use of climate-related financial risk disclosures and reporting; and D) Greater use of new and innovative blended finance vehicles (CPI, 2017).

The Paris Agreement is considered a milestone because for the first time most nations have made commitments through their NDCs to reducing emissions in order to limit the temperature increase to under 2°C compared to pre-industrial patterns. Additionally, it can foster a growing market for solutions and investments in green and climate resilient infrastructure (CDP and C40, 2018).

The Global Commission on the Economy and Climate estimates that over US\$1 trillion in investment in this kind of project is needed by 2050. Considering the NDCs the resources needed to accomplish with countries' targets

reach US\$ 4 trillion, an annual investment of US\$350 billion. In Latin America, an investment of around US\$51 billion will be required (Weischer et al, 2016).

In 2009, developed countries committed to mobilizing US\$100 billion per year by 2020 from public and private sources, and agreed to set new, higher financing targets by 2025 (UNFCCC 2015: Decision 1/CP.21, paragraphs 114 and 53).

Governments alone cannot achieve this massive shift in investment, which is why the private sector plays such a pivotal role in driving investment to mitigation and adaptation. Financial institutions and professionals can help with innovative approaches to raising capital in order to limit the global temperature increase to under 2°C, as well as to accelerate the transition to climate resilient economies and societies. For their part, governments can also incentivize private investment through policies, subsidies, grants, concessional loans and risk mitigation mechanisms including insurance and government guarantees (Clark, Reed and Sunderland, 2018)

A good example would be a green focus on urban finance through property taxes that stimulate density, transportation fees that reduce car traffic, and fees that stimulate responsible water consumption. Public finance can also be used to leverage finance

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from private actors through loans, bonds and carbon markets; to create incentives for them to invest in sustainable infrastructure related to new development; and to get them involved in partnerships so government can benefit from private sector knowledge and experience in greening infrastructure (Merk et al, 2012).

Resources for sustainable infrastructure can also come from reforms in the tax structure, as well as the removal of subsidies for fossil fuels that are still high despite their negative environmental, fiscal, macroeconomic and social consequences (UNFCCC, 2016). From 2001 to 2013, global subsidies for fossil fuels averaged over US\$500 billion per year. Since then however, they have declined by about a third, primarily due to falling world oil and natural gas prices. Historically, oil accounted for about 50% of the total, but this share fell to 40% in 2015. Electricity accounted for about 30% of the subsidies, and natural gas about 20%.

In 2009, G20 pledged to phase out inefficient fossil fuel subsidies. Some advancements have been made, particularly in countries such as Indonesia, but in many countries progress has been slow. The International Energy Agency (IEA) estimates that reforms adopted since 2009 reduced the value of fossil fuel subsidies in 2014 by 24% (US\$117 billion). At the G7 summit in Japan in May 2016, however, the governments of The United Kingdom, The United States, Canada, France, Germany, Italy, Japan and other EU members were committed to the “elimination of inefficient fossil fuel subsidies (UNFCCC, 2016).

This commitment was also reinforced by 390 long-term institutional investors, representing more than US\$22 trillion in assets, who have written to G20 leaders urging governments to stand by their commitment to the Paris Agreement at their upcoming Summit in Hamburg in July 2017.

This letter was the result of the engagement of investors’ networks of. Asia Investor Group on Climate Change, CDP, Ceres, Investor Group on

Climate Change, Institutional Investors Group on Climate Change, Principles for Responsible Investment and UNEP Finance Initiative.

In her statement about the launch of this Global Investors letter, Stephanie Pfeifer, CEO of the IIGCC in Europe, argued that investors recognize that the global transition to a low-carbon, clean energy economy is underway. In her view, investors want to make well-informed decisions, which is the reason they have requested that G20 countries “adopt policies that drive better disclosure of climate risk, curb fossil fuel subsidies and put in place strong pricing signals sufficient to catalyse the significant private sector investment in low carbon solutions” (IIGCC, 2017).

There is also a lot to be done in this respect by the subnational governments that are leading the way alongside the private sector in taking action to accelerate the new climate economy.

Over 570 cities now report through CDP – a total of 650 million people. More than 100 of which operate almost entirely on renewable energy, not to mention those that have adopted clean transport, energy efficiency and green infrastructure.

Another bold example comes from United States, where actors from over 3500 cities, states and tribes, as well as businesses, universities, and other non-federal actors, have signed the We Are Still In declaration and established the largest national coalition in support of climate action.

Representing more than 160 million North Americans and \$6.2 trillion of the U.S. economy, the signatories of the We Are Still In declaration recognize The Paris Accord as a landmark agreement. As the declaration states, “nations - inspired by the actions of local and regional governments, along with businesses - came to recognize that fighting climate change brings significant economic and public health benefits” (We Are Still In, 2017).

2.7 Role of multilateral development and DFIs

The role of Multilateral Development Banks goes beyond financial intermediaries, given that they help to build the institutional capacity of finance recipient countries by providing knowledge and relevant information on regional experiences, replicating the best practices, providing assistance on national sectorial plans and creating financial mechanisms, among other things (Neves and Prata, 2018).

Within public sources of finance, Development Finance Institutions (DFIs) continue to raise, manage, and distribute the largest share of public finance. National DFIs have reduced their commitments by 13% during 2015/2016 compared to 2013/2014, partially due to economic volatility in some emerging markets. Multilateral and bilateral DFIs continue to make significant progress in scaling up climate finance lending in line with their internal institutional 2020 targets. Multilateral DFIs are already over three-quarters of the way to meeting their 2020 targets. They are also joined by new institutions in the arena, such as the Green Climate Fund, as well as other emerging market-led institutions, such as the Asian Infrastructure Investment Bank and the New Development Bank, providing a combined \$2.5 billion of new investment in 2016 (CPI, 2017).

3

Methodology



Given that the research subject of this White paper encompassed a variety of disciplines, an exploratory approach was preferred, based on a combination of bibliographic research, survey and documentary research.

Bibliographic research is characterized by the collection of theoretical references previously analyzed and published by written or electronic means, such as books, scientific articles or website pages. This procedure was deemed appropriate for the purposes of this research, since it allows for the gathering of information or previous knowledge about the problem studied (FONSECA, 2002, page 32).

From the initial observations on the literature review, some information gaps were identified with regard to the obstacles and opportunities for investment in green infrastructure that were addressed by the implementation of the surveys.

This research procedure proved to be well-suited, as it collects information directly from an interest group regarding the data to be obtained (SANTOS, 1999). Survey research provides data or information about the characteristics or opinions of a particular group of people, recommended as representative of a target population, using a questionnaire as a research tool (FONSECA, 2002, p.33).

The first survey was aimed at city public officials with the objective of identifying and qualifying green infrastructure projects, as well as the institutional capacity of cities to collaborate with the private sector. This survey was sent to the 184 Latin American cities that responded to the CDP questionnaire in 2018.

The sample of cities that responded to the CDP questionnaire was selected for its representativeness and also to provide a public database, which can then be accessed by financial institutions and other interested parties.

In addition, this data is collected according to internationally recognized reporting standards, allowing for the comparability of key indicators of the cities in relation to climate change management.

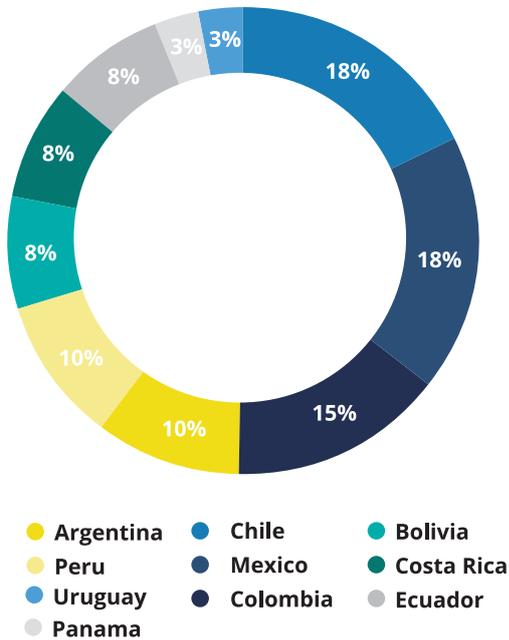
The second survey targeted institutional investors with the objective of identifying and qualifying the demand for sustainable infrastructure projects in cities, and was sent to the 600 signatory CDP investors as well as to UNEP-FI members in Latin America.

The questions for both surveys were developed based on the main obstacles and opportunities for investment in green infrastructure of the cities identified in the literature review. The full questionnaires can be found in the annexes.

These results were complemented by documentary research that proved appropriate for following the same bibliographical research methods, but using more diversified sources without analytical treatment (FONSECA, 2002, 32). In this case, we focused on the CDP database, which analyzed the responses of the 184 cities in Latin America that participated in the 2018 version of the organization's reporting cycle.

As Latin America is such an all-encompassing term, five countries were selected for analysis as part of the documentary research: Argentina, Bolivia, Chile, Colombia and Peru. They were chosen with the intention of establishing a sample with different economic situations and also to present the largest number of respondent cities in the 2018 version of the CDP questionnaire, except for Brazil, which alone registered 96 respondent cities and could thus dictate the trend of the sample. This resulted in a list of 88 cities, representing 29% of CDP respondents in Latin America in 2018.

Figure 7: Sample of participating cities by country



The CDP questionnaire is very comprehensive, as it aims to identify the main impacts, risks and opportunities associated with the climate changes to which the city is exposed. The act of reporting also provides a blueprint for developing a strategy and taking action to strengthen resilience to climate change. In addition, it makes use of a methodology to evaluate the stages of the development of resilience in the face of climate change, from A to D (A: Leadership, B: Management, C: Awareness, D: Disclosure). The rationale is the same as a ratings system and aims to assess the climate governance of cities. Therefore, it is an important indicator both to guide the actions of cities in the pursuit of continuous improvement, as well as for investors offering subsidies to assess the climate governance of cities.

The CDP city questionnaire also includes a specific question about whether the municipality has climate projects for which it is seeking funding, and the answers given by the cities to this question were the subject of specific analysis.

This information was sought in greater detail in semi-structured interviews with experts and representatives from the financial sector, which

aimed to qualify investors' demands for urban sustainable infrastructure projects in Latin America, as well as to identify the obstacles that still need to be overcome in order to mobilize private capital at the required scale.

The semi-structured interviews began by selecting representatives of financial institutions that answered the survey, such as development banks, commercial banks and asset managers, among others. The first group was asked to give suggestions from new interviewees receiving recommendations from experts regarding the subject by way of a "snowball" technique. As a result, a total of eight interviews were conducted which provided insights into alternatives for mobilizing private capital in sustainable infrastructure projects in cities. The results can be seen below.

4

Results



4.1 Survey of cities

The survey was elaborated based on the information gaps identified in the literature review. It was applied through an online questionnaire sent to the 88 cities that reported to the CDP in Latin America in 2018, excluding only the Brazilian cities (which represented 96 of the 184 cities in the region) in order not to influence the sample.

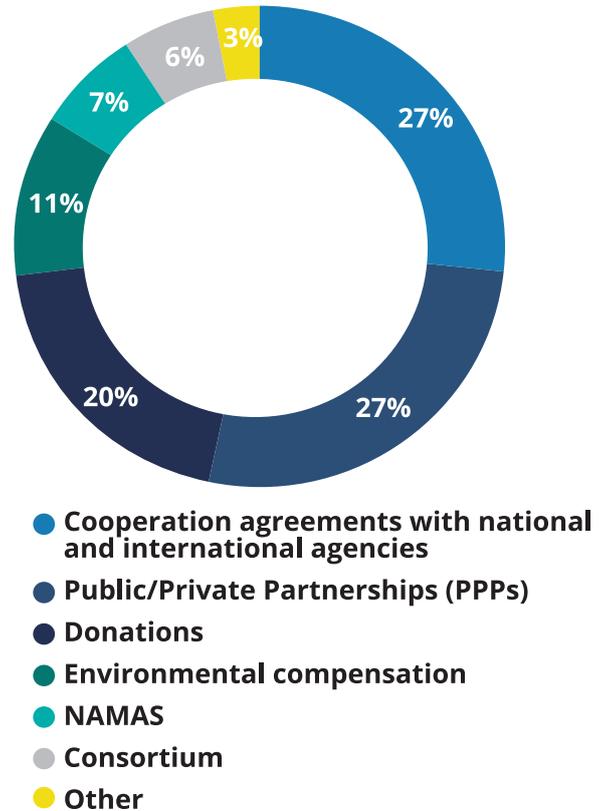
The online survey was emailed to 88 cities, from which we obtained 39 responses from a variety of countries, details of which can be found in the figure below.

Figure 8: Cities participating in the survey



Based on the analysis of the responses provided by the cities participating in the survey, it was observed that the most cited form of project financing was cooperation agreements with national and multilateral agencies.

Figure 9: Sources of funding for city projects



The responses also highlighted the prevalence of PPPs, which have grown significantly in Latin American economies. Given the budget constraints and low investment capacity of the region’s governments, PPPs represent an alternative for mobilizing investments in strategic areas such as infrastructure. The logic is similar to that of a financing agreement, as it allows municipalities to dilute the financial impact over several years, due to the fact that a PPP can last from 5 to 35 years. This is an attractive option for municipalities, because most of them do not have the capacity to invest in large-scale infrastructure projects. Therefore, in adopting a PPP, governments can mobilize resources from the private sector, paying for this investment in the medium or long term (EACH - USP, 2017).

The rules for the adoption of these PPPs vary according to the legislation of each country, although they do have some characteristics in common as this model was inspired by the

Project Finance Initiative (PFI). Pioneered by the governments of Australia and the United Kingdom in the early 1990s, the PFI initiated this form of public-private partnership.

The broader sense of PPPs consists of a long-term collaboration between the public and private sectors to finance the construction or improvement of an infrastructure asset linked to the provision of a service. The narrower sense, however, concerns concessions, which can be of two types: a) administrative concessions, which are only feasible with the collection of tariffs, and b) sponsored concessions, which need some kind of public contribution, a counterpart paid by the government.

Another funding mechanism cited by 20% of respondents was donations, which include transfers of resources from both the private sector and multilateral institutions that allocate resources to non-repayable grants. Environmental compensation also accounted for a significant percentage (11%), and corresponded to private sector investment as compensation for environmental impacts generated by its activity. Some municipalities have specific funds with resources obtained from these compensations which have been partially used to finance climate projects. Examples include the fund in Colombia managed by Financiera del Desarrollo Territorial de Colombia (Findeter), a local development bank, and another in Argentina - from a collective fund of subnational governments managed by Banco Galicia - both of which will be examined in more detail in the interview analysis.

Another option highlighted by some of the cities participating in the survey was the form of consortia, the rules for which vary from country to country, although in general they are characterized by contracts signed between the different spheres of government (national, state and municipal) to carry out objectives of common interest. The union of these different spheres of government in consortia can result in the scale necessary to make a partnership with the private sector economically viable. Less commonly cited, Nationally Appropriate Mitigation Actions (NAMAs) can also be used as a mechanism to access funding. For example,

a NAMA with private sector participation focused on adaptation projects in Colombian cities was identified, further details of which can be found in the analysis of the interview results.

Fundraising for projects via capital markets was not mentioned by any city, a result which is partly explained by legal impediments to the issuance of debt securities by subnational governments in many countries due to issues of fiscal responsibility. Nevertheless, an alternative would be the issuance of project debentures in partnership with the private sector, although this option was not recorded in the research despite this option being offered as one of the alternatives. Legal constraints and administrative complications were two of the main issues identified by cities as current obstacles to attracting private investment in sustainable infrastructure in cities, as detailed in Figure 10 below.

Figure 10: Obstacles to private sector investment in city projects



The answers were very varied, which allows us to infer that many questions are interrelated and therefore need to be addressed by a set of coordinated actions. For example, issues related to management changes and lack of political support for green projects are related to the cyclical nature of public management, which often makes it difficult to prioritize issues such as green infrastructure, as they are more directed towards the long term. These questions require state strategies and policies, meaning that they would not be subject to discontinuity due to management changes. With regard to a specific green infrastructure agenda, certain factors could help overcome these obstacles, for example greater awareness among public managers and civil society of the economic opportunities, security and well-being of the population which could result from investments in this area.

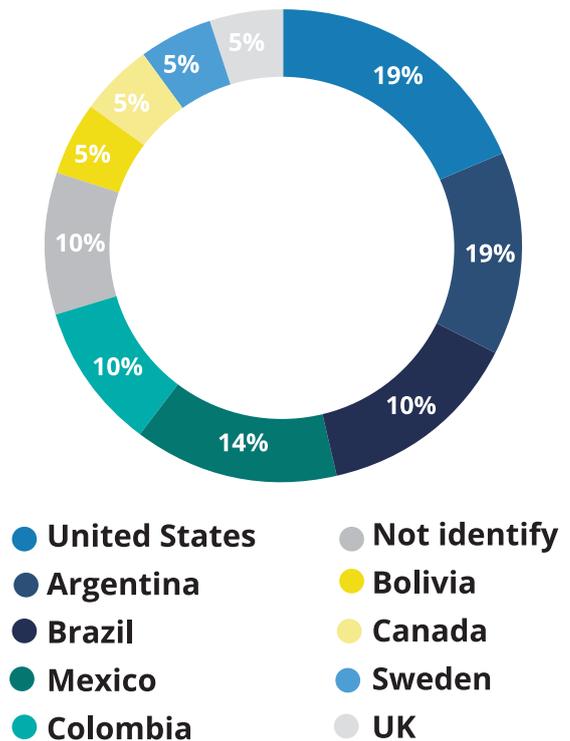
It is noteworthy that one obstacle reported by the cities was the difficulty of meeting the needs of private investors, most critically with regard to the return on the investment. This is because infrastructure projects often give high risk and long-term returns, a risk-return ratio that most private investors are not yet willing to accept without some guarantee. These guarantees can be provided in the form of agreements with development banks and multilateral institutions, as is already the case with Project Finance. However, there is still much room for innovation, starting with the development of new financial products and coordinated action among the different players in the financial system.

These challenges and opportunities are further discussed in the interviews, the results of which will be analysed in section 5.4.

4.2 Survey with investors

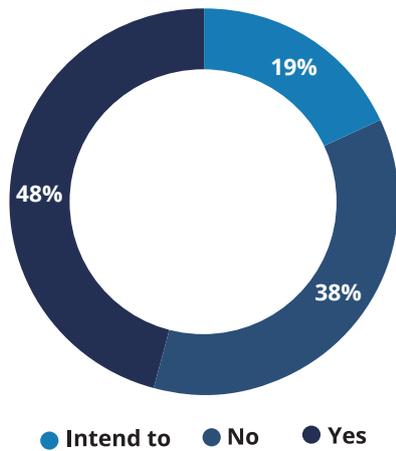
The investor survey was also prepared based on the observations about the literature review. It was implemented by way of an online questionnaire sent to 600 investors, including CDP signatories and UNEP-FI associates. A webinar was also held to present the research objectives, and invited investors were contacted by telephone; as a result of these combined efforts, a total of 21 responses were obtained from investors. Of the respondents, 34% represent investors from countries outside Latin America, with the United States being the most significant at 19%. It is worth noting, however, that 10% did not indicate a specific country of origin.

Figure 11: Investors participating in the survey by country



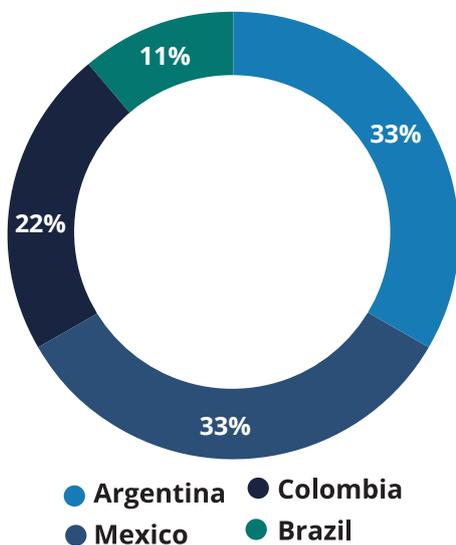
48% of the respondents indicated that they are currently investing in sustainable infrastructure projects in Latin American cities, while another 19% said they intended to invest and 38% said that they did not.

Figure 12: Private sector investment in Latin America



However, among those who already invest in green infrastructure projects in Latin American cities, all of them represented financial institutions in Latin America. **The countries identified by the investors as being of greatest interest for investors are Argentina and Mexico, followed by Colombia**

Figure 13: Interest in investment by country



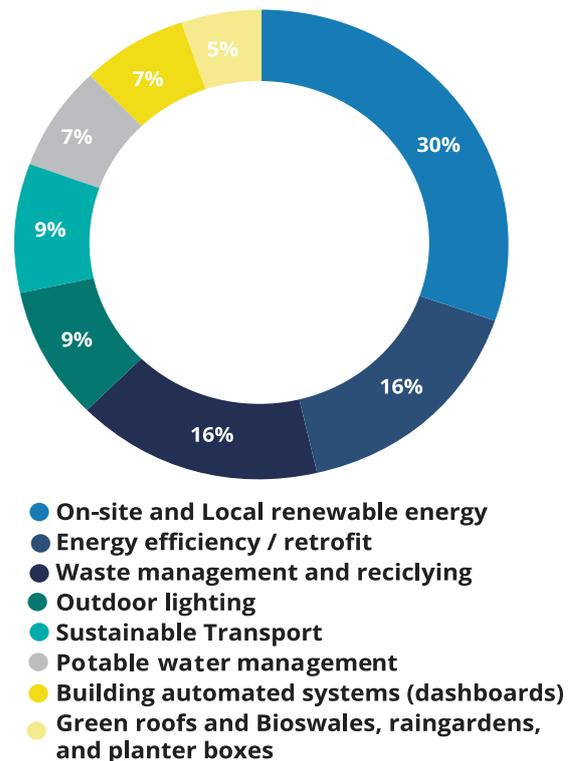
The options for project topics followed the nomenclature of the CDP Cities questionnaire, which was used to provide a more detailed analysis of the projects at a later stage.

The areas of greatest interest reported by investors were local production of energy and renewable energy (30%), energy efficiency and retrofit (16%), and waste management and

recycling (16%). The other topics were in a similar percentage range, representing between 5% to 9% of the total responses.

Among investors looking to invest in green infrastructure projects in Latin America, 75% are international institutions from countries outside Latin America.

Figure 13: Interest in investment by topic



Some of these investors also highlighted the current obstacles to investment, including regulatory barriers, political and macroeconomic risks (such as currency fluctuations and inflation).

The research also questioned some of the restrictions on investments in Latin America, and investors' responses included issues such as return guarantees and the inability to provide loans in all local currencies, requiring synthetic loans through local banks.

In most cases, investors who declined to invest in green infrastructure projects in Latin America also did not mention their reasons, so it was not possible to make any significant analysis in this respect.

4.3 Documentary research - CDP database

In order to address some of the gaps left by the survey, a documentary analysis was also conducted based on a selection of questions from the CDP Cities questionnaire related to infrastructure and collaboration with the private sector.

For the purposes of this more detailed analysis, we delimited the scope of the research to five countries: Argentina, Bolivia, Chile, Colombia and Peru, which represent the countries with the largest number of CDP respondent cities. This excluded Brazil so as not to distort results, given that this country alone accounted for 96 of the 184 cities that participated in the 2018 version of the CDP Cities questionnaire in Latin America.

A sample of 53 cities was therefore selected for the documentary research, distributed by country as detailed below.

Table 2: Cities selected for documentary research, by country

COUNTRY	CITIES
Colombia	24
Chile	9
Peru	9
Argentina	8
Bolivia	3
TOTAL	53

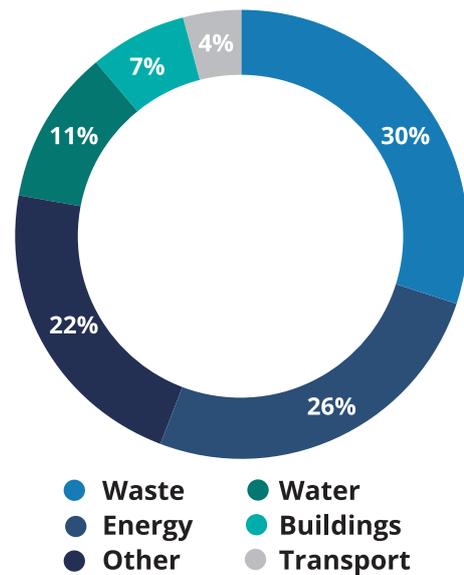
Analyzing the responses from these cities as a whole, it was observed that 75% already face some negative impacts of climate change, which affect areas from access to basic services (11%) to capacity and infrastructure conditions (4%).

Collaboration with the private sector is a practice highlighted by 48% of cities, while a

further 14% still do not have partnerships with the private sector, but intend to do so.

Among the areas of collaboration with the private sector, the most cited are waste management (30%) and energy (26%). More details can be found in Figure 14 below.

Figure 14: Areas of collaboration with the private sector



The CDP Cities questionnaire includes a specific question about climate projects for which cities are seeking funding, which encompasses emissions reduction, adaptation, and water or resilience related initiatives. This question was the subject of specific analysis from the responses of the 53 cities that reported projects of this nature in the five selected countries.

It is also important to highlight the fact that Latin America is the region with the highest number of climatic projects reported globally to the CDP, and access to financing is cited as the main difficulty in tackling climate change in the region's cities.

The 53 cities included in this study reported 104 projects that together are seeking funding of US\$1.6 billion.

By way of comparison, the Green Climate Fund alone has allocated \$4.6 billion for mitigation and adaptation projects since its inception in 2015. The fund was established as part of the Paris Accord to invest in low emission and climate resilient projects in developing countries. Subnational governments can apply to become an accredited organization and thus be able to submit projects to compete for resources. Accreditation criteria include issues such as fiduciary responsibility, social, environmental and gender policies/ guidelines, as well as providing evidence of the implementation of these policies.

Projects related to renewable energy, transportation, water and waste management together account for more than half of those reported.

There is also a significant percentage of projects that have been incorporated into other projects, including initiatives as varied as the implementation of green areas, irrigation projects to reduce water consumption and air quality monitoring stations.

With regard to the development stage, most of the reported projects are in the scope phase (33%) and pre-feasibility studies phase (32%), which therefore require initial investment to be developed, and are subject to greater risks.

There is also a significant number of projects in the pre-implementation phase (9%) and the implementation phase (13%); from this phase onwards private sector participation is already becoming more feasible, mainly due to the growth of blended finance. This consists of the strategic use of development finance and philanthropic funds to mobilize private capital in emerging and border markets, resulting in positive outcomes for both investors and communities.

Figure 15: Projects by topic

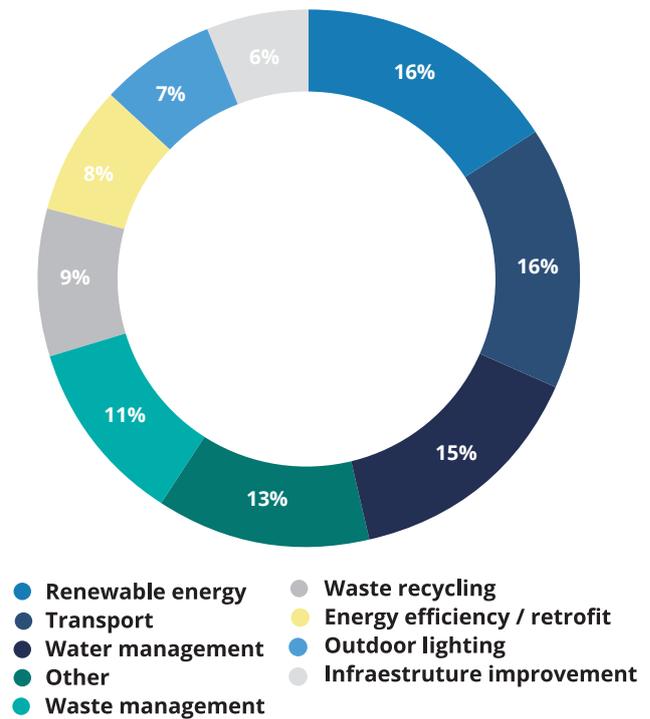
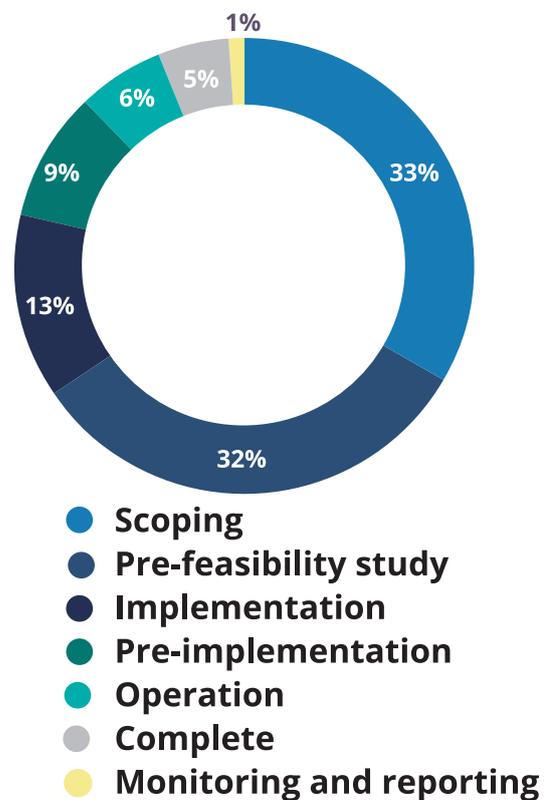


Figure 16: Projects by phase



4.4 Analysis of interviews

Eight semi-structured interviews were conducted with financial and infrastructure market experts, as well as representatives from financial institutions (two commercial banks, a development bank, an asset manager, two international investment experts, and one infrastructure investment consultant).

One of the first points raised in the interviews was that the challenges faced when trying to mobilize private sector capital are not unique to sustainable infrastructure projects, or even a particular feature of Latin America. The funding gap exists, but it is not unique to this region. In general, governments do not have the financial resources to pay for infrastructure development, as they have debts and are not able to increase the percentage of investment in infrastructure in relation to GDP.

The need for investment in infrastructure can be seen in different sectors of the economy around the world, from public transport to the infrastructure required to ensure the quantity and quality of water supply, for example. However, this investment needs to be redirected from fossil fuels to renewable sources, and many Latin American countries have comparative advantages in this transition given their strategic reserves of natural resources.

“We need to stop thinking of Latin America as something special compared to other markets. Each economy faces virtually the same infrastructure challenges. If we had to look at where there might be some uniqueness in Latin America compared to the rest of the world, it would be in the base of natural resources that most countries do not have.” (International investment expert)

What governments often lack in Latin America is a credit profile that permits them to raise funds from international investors. In addition, there are challenges related to the size of city projects, often too small for institutional investors seeking investments of over \$100 million. Based on the interviews conducted, these obstacles may be overcome with securitization and de-risking strategies.

Securitization is a financial practice that consists of grouping together various types of financial assets, then converting them into negotiable standardized securities in the domestic and external capital markets. Debt is thus transferred, or sold, to various investors in the form of securities.

Development banks play an important role in securitization (in addition to their more conventional role of transferring resources via loans), enabling the participation of institutional investors in this sustainable infrastructure market. In the same way that finance ministries and secretariats also need to think about risk mitigation measures and to promote financial products that attract greater participation from institutional investors in green urban infrastructure projects.

Securitization allows for the development of financial products such as funds that do nothing more than group debt bonds from infrastructure projects into an investment product with the capacity to become large-scale. It is thus possible to bring together smaller projects to create a product of sufficient size to attract institutional investors.

4.4.1 Project Finance

Project finance is a financing model that uses the cash flow of the project to pay the debt agreed between investors and financiers. Some guarantees are therefore required from policyholders, such as insurance policies that cover the amount financed.

“

“We need to secure more centralization around Project Finance projects in order to provide funding at an early stage, and we need to have these risk reduction mechanisms (de-risking). Development Banks play a key role in this, as they offer the guarantees. If the project goes into default - that is, it is not executed as expected - the guarantees are invoked in order to pay the bill.” (International investment expert)

It represents a viable financial model for both private and public-private partnerships (PPPs) and concessions, provided that the project has some basic characteristics such as the existence of a separate economic investment, preferably a Special-Purpose Entity (SPE) - widely used in infrastructure projects that demand large investment with long-term returns.

Project Finance projects are mostly funded by development banks and multilateral institutions. Commercial banks operate in this area by offering guarantees, also known as completion bonds. Borrowers are required to provide these guarantees by development banks and multilateral institutions.

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“When granting this guarantee, the bank assumes responsibility for the debt if the project goes into default. In this case, the lenders may invoke the bank guarantee if the project is not performed properly or does not generate the expected financial returns.” (Commercial bank representative)

Private financial institutions participate more in the area of Corporate Finance, in which the company's cash flow is used to pay the debt, so the risk is lower than in Project Finance, where the payment of the debt is guaranteed

only by the cash flow of the project.

The companies responsible for implementing these infrastructure projects, when listed on the stock exchange, may also issue debt securities via debentures in the capital market. Overall, investors have a good appetite for bonds issued by companies implementing infrastructure projects provided that they have good credit.

4.4.2 Green bonds

One of the alternatives with great potential for raising funds through capital markets for urban infrastructure projects is the issuance of green bonds.

These are very similar to ordinary debt securities, except they can only be used to finance investments that are considered sustainable - such as clean and renewable energy infrastructure, green transportation and projects capable of reducing emissions or the consumption of water, energy or raw materials.

It is like a promise between the issuer of the title - which could be a company or a government - and those investing in the project. When buying a green bond, an investor is lending money for a set period of time, and this money is used for the project and returned to the investor with interest.

The climate bond market is worth \$1.45 trillion. Internationally the fastest growing green bonds are muni-bonds, representing an important instrument for financing projects in cities that help achieve their climate goals. In the United States alone the muni-bonds already generate \$250 billion a year. However, in many Latin American economies, subnational governments are unable to issue debt securities of any kind due to their fiscal responsibilities.

However, this obstacle does not reduce the role of climate bonds, which are in growing de-

Results

mand in the international market and often help to accelerate the pace of change.

The issuance of a climate bonds does not always consist of an appropriate instrument to attract investors at an early stage in emerging economies, where we see the greatest potential for issuing such bonds, including Latin America. But they have a powerful narrative that must be used to mobilize institutional investors and accelerate investment in green urban infrastructure.

Mexico City was the first city in Latin America to issue \$50 million worth of green bonds for climate change and transportation resilient infrastructure projects. After that the municipality initiated two further green bond issues, and also sold forest carbon stocks in the California carbon market.

Based on the previous experiences of issuing green bonds by Latin American commercial banks, the IFC acquired all the securities placed on the market by Banco Galicia and Bancolombia. The funds raised are being used to finance Banco Galicia projects in the area of renewable energy and energy efficiency. The green bonds raised by Bancolombia are destined not only to these areas, but also to financing clean transportation, sustainable land use, water and waste management, sustainable construction and biodiversity conservation. (Bancolombia, 2018)

Some banks in the region worked on structuring green bonds for issuance by their clients, such as Itaú-Unibanco, which coordinated the first issue of green bonds in Brazil by Suzano Papel e Celulose, sold for R\$1 billion and currently being traded on the market by Itaú-Unibanco.

“Investing in green bonds is a way to diversify investment portfolios. There are still few green financial products on the market so the demand is quite high, therefore the interest rates of those putting this type of instrument on the market tend to be lower.” (Commercial bank representative).

In Argentina, subnational governments can issue debt securities to finance themselves, and are also authorized to borrow from multilateral institutions and private banks. However, that depends on the size and administrative capacity of the city.

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“The Central Bank is very demanding when lending to the public sector because in the past this area has not been so disciplined, spending beyond its capacity, making the regulations increasingly restrictive. The regulations are old and have many requirements that must be met and do not include environmental aspects, because at that time these topics were not being discussed.” (Commercial bank representative).

Therefore, one alternative would be the transfer of resources to projects led by the private sector, another would be to put together a series of city projects into a fund, operated by a public or private financial institution. This is already the case in Argentina, by way of a product called a loan syndicate, in which state and municipal governments place their resources in a common fund managed by a bank. The objectives are defined by the governments as well as the time of liquidation, in which each one receives its corresponding quota.

Another experience in this area was identified in Colombia, where Findeter mapped companies, which as a result of licensing constraints have to invest to offset the environmental impacts of their activities. Through this program, Findeter has developed plans of action for 23 cities with more than 200,000 inhabitants and 27 smaller cities, in order to execute projects related to sustainable development.

The Nationally Appropriate Mitigation Actions (NAMAS) have also been used as a tool to finance urban projects and to facilitate the participation of the private sector.

In Colombia, the NAMA for Transit-Oriented Development (DOT) aims to direct strategic investments towards model neighborhoods which are planned to prioritize public transportation. Therefore, these investments are intended to transform urban development in the country, changing the form and the places in which investments are made in order to increase returns not only in economic terms, but also in environmental and social terms (CCAP, 2013).

Findeter is also working on the design of a NAMA for electric mobility, where private sector participation has been predicted since its inception.

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“We seek to identify the priorities of cities and how the private sector can intervene. In order to do this, we have organized roundtables with them and analyzed the necessary signals from the government, either in the form of national policies or incentives to mobilize resources from the private sector for the implementation and execution of these projects.” (Development bank representative).

Through interviews with investors, examples of equity investment have also been identified; the participation in companies that offer solutions in the area of sustainable urban infrastructure. Examples include companies with technologies for rainfall management for example, allowing for the mitigation of extreme climatic events like heavy rains or floods, such as the management of public water reservoirs.

In this case, according to the interviewees, two points are fundamental for leveraging equity investments: greater transparency on the part of the governments and availability of solutions and/or projects already tested in the market.



Case Studies

The regulatory and economic
landscape of each country



Colombia

According to the economic forecast for Colombia prepared by OCDE, the economy is projected to grow as a result of infrastructure projects. There are, however, some risks of additional delays in planning large projects of this type, which may lead to increasing global protectionism, policy uncertainty in the region and financial volatility in emerging market economies. The country also needs to improve social indicators, as the informal economy remains large (OCDE, 2018b).

In the last six years, Colombia has concentrated its efforts on promoting PPPs - including the development of the Fourth Generation (4G) Toll Road Program - to stimulate private capital for infrastructure investment. The country also strengthened its regulatory framework, including new, refined PPP and infrastructure laws, as well as standardized contracts and processes. In addition, Colombia created two independent and highly-specialized institutions for finance and infrastructure: the Financiera de Desarrollo Nacional (FDN) and Agencia Nacional de Infraestructura (ANI), which focus on infrastructure development and are safeguarded against political cycles and corruption.

All these changes have already resulted in successful transactions. For example, the 4G Program has led to 32 projects with a total investment of \$18 billion, including innovative bond issuances. Moving forward, ANI is planning investments of \$33.9 billion by 2025 in the transport sector alone. This successful experience of bonds issuance could be used to boost sustainable infrastructure.

In terms of climate policies, the country began its initiatives in 2011 with the Colombian Low Carbon Development Strategy (ECDC), the National Plan for Adaptation to Climate Change (NACC) and the National REDD + Strategy, among others. In 2014, these initiatives were united in the National Policy on Climate Change, which introduced new guidelines for fulfilling the climate commitments

made by Colombia in the Paris Agreement. The target set is to reduce greenhouse gas emissions by 20% with respect to the projected Business-as-Usual Scenario (BAU) by 2030. (UNFCCC, 2018).

Colombia's National Policy on Climate Change sets out five specific strategies including "climate-resilient low carbon urban development" and "development of low-carbon, climate-resilient infrastructure." Cities also play an important role in other areas prioritized in the policy, such as land and use, mineral and energy development, as well as ecosystem conservation, given their position as major centers of consumption and innovation.

In addition, as part of the tax reforms implemented in Colombia, a carbon tax came into effect on January 1st 2017, applying a rate of COP15,000/tCO₂ (US\$5/tCO₂) on liquid and gaseous fossil fuels used for combustion. The carbon tax covers about 24% of the country's GHG emissions. Tax exemptions apply to natural gas consumers that are not in the petrochemical and refinery sectors, and fossil fuel consumers that are certified as carbon neutral. Emitters can achieve carbon neutrality through the use of offset credits generated from projects in Colombia. Credits have to be verified by auditors accredited by the UNFCCC (Colombia's national accreditation body), or a member of the International Accreditation Forum. Until the end of 2017, credits generated by non-CDM projects outside Colombia were also eligible. The carbon tax is expected to raise COP660 billion (US\$229 million) per year in government revenue, which is already earmarked for the Colombia in Peace Fund, and will support activities such as watershed conservation, ecosystem protection and coastal erosion management. (World Bank, 2017c)

Argentina

According to the OCDE Economic Forecast, inflation and the current budget deficit are projected to decline in Argentina, which would leave the economy with more solid macroeconomic fundamentals and reduced vulnerability to market volatility. Reducing obstacles to entrepreneurship would also strengthen productivity and stimulate job creation. Improving access to quality education and training would help workers prepare for these new opportunities, while more effective unemployment insurance could provide income support for workers as jobs move across firms or sectors. Development of capital markets would diversify sources of funding for investment and public debt. (OCDE, 2018c).

Following the sovereign default in 2014, Argentina has been focusing on its return to the international financial market. The government has removed capital and repatriation restrictions, implemented a tax amnesty scheme, and created the Argentina Investment and Trade Promotion Agency. The government also established cross-party political consensus to strengthen the legislative framework, with a new PPP law (2016) and an accompanying regulatory decree (2017). Significantly, this framework creates a centralized PPP Unit within the Ministry of Finance. Argentina's portfolio includes \$169 billion of investment in infrastructure, including \$48 billion in roads and \$34 billion in the energy sector. (World Bank, 2017).

With regard to climate policies, Argentina pledged in its National Determined Contribution that by 2030 the country would not exceed a net emission of 483 million tons of carbon dioxide equivalent (tCO₂eq). (UNFCCC, 2018b)

Argentina is one of the few countries

that have increased their NDC targets, improving its content and being reflected in national policy. However, Argentina's sectorial policies are not consistent with the temperature limit of 2°C stipulated in the Paris Agreement, especially with respect to fossil fuels, agriculture and transport, although Argentina is showing some progress in the area of renewable energy. (Climate Transparency, 2018)

In 2016 the government launched a US\$5.7bn investment program to promote renewable energies, and received funding from the Green Climate Fund to guarantee the investment through the World Bank. (Climate Transparency, 2018).

On December 28th 2017, a carbon tax was adopted in Argentina as a result of an integral taxation reform and fiscal rationalization. The full rate of this tax is based on the local currency equivalent of US\$10/tCO₂e. From January 1st 2019, the tax is planned to be levied at the full rate for most liquid fuels. For fuel oil, mineral coal, and petroleum coke, the tax rate will start at 10% of the full rate, increasing annually by 10% to reach 100% in 2028. The carbon tax is estimated to cover about 20% of the country's GHG emissions, and is expected to raise approximately ARS11.5 billion (US\$571 million) per year in revenue when fuel oil, mineral coal and petroleum coke producers will pay the full rate. The revenue is intended to benefit multiple organizations, including the National Housing Fund, the Transport Infrastructure Trust, the social security system and programs to promote renewable energy and energy efficiency. Tax exemptions apply to international aviation and shipping, export of covered fuels, the biofuel content of liquid fuels and the use of fossil fuels as raw materials in chemical processes. (World Bank, 2017c).

Peru

The economy should continue to expand at a solid pace, driven by robust domestic demand and sturdy foreign sales of commodities. Consumer spending will benefit from healthy employment growth and improving consumer confidence, while fixed investment will be spurred by solid credit growth, sustained investor confidence and increasing infrastructure spending. (Focus Economics, 2019).

With a record number of 76 PPPs between 2004 and 2016, Peru has updated its legal and institutional PPP framework to attract higher quality projects. Significantly, the changes include strengthening the independence of Proinversion, the agency that promotes private investments in public services and infrastructure through PPPs. Members of the Board of Directors are independently appointed; the role of the Ministry of Economy and Finance (MEF) in the PPP cycle is more sharply defined; anti-corruption provisions are included; and the capacities of the sector and subnational PPP agencies have been expanded. In addition, for the first time in Peru infrastructure plans include explicit medium-term planning. The two-year planning timescale of the PPP portfolio includes investments of \$14.6 billion, mainly focused on transportation (\$9.6 billion) and energy (\$1.1 billion). (World Bank, 2017).

With regard to climate policies, Peru has made progress with its agenda since the country hosted the Convention of Parties (COP) of UNFCCC in 2014. In its NDC Peru has set a target of a 30% reduction in Greenhouse Gas (GHG) emissions in relation to the projected Business as Usual scenario (BaU) by 2030. Peruvian NDC is one of the only ones to make reference to the importance of cities in reaching its targets, noting that 76% of the population lives in urban areas, and highlighting the importance of the vulnerability of cities as well as promoting the concept of "Resilient Cities" as units of climate risk management. (UNFCCC, 2016)

Chile

Growth is projected to remain strong over the next two years. With an uncertain external environment, solid domestic demand will underpin growth, although these negative effects might be minimized by a stable inflation rate, public infrastructure projects and tax reform. Inequality, though decreasing, remains high as informality and unemployment remain high and social transfers low. (OCDE, 2018d).

Through its Nationally Determined Contribution, Chile has committed to reducing its CO₂ emissions per GDP unit by 30% below their 2007 levels by 2030, taking into account future economic growth which allows for the implementation of adequate measures to fulfill this commitment. (UNFCCC, 2017).

In 2016 a carbon tax was introduced in Chile as part of a package of environmental taxes to reduce the negative environmental and health impacts of fossil fuel use. This has proven effective in diverting investments away from sources that produce a high level of air pollution and are thus subject to higher taxation rates. have a large tax base due to large local air pollution. Other jurisdictions have earmarked carbon pricing revenues to fund broader social or environmental policies.

The Chilean carbon tax came into effect on January 1st 2017, and applies to all stationary sources with a thermal capacity greater than 50 megawatts. The rate of this tax is the local currency equivalent of US\$5/tCO₂e, which means that tax liabilities in the local currency will depend on the prevailing exchange rate on the day of payment.

Chile raised the equivalent of US\$193 million in green tax in 2017, collected from 94 establishments (fixed sources) that have boilers or turbines with a power of 50 megawatts thermal or more (MWt).

At the end of January 2018, Chile's four electricity providers announced an agreement with the

government in which they pledged not to invest in coal-fired power plants, unless the plant has a carbon capture and storage system.

In addition, Chile led discussions among Pacific Alliance governments to develop linked carbon pricing initiatives, including the existing linkage between the ETSs in California, Ontario and Québec, and the scheduled linkage between the ETSs of the EU and Switzerland. Members of the Pacific Alliance are also exploring possibilities for a regional market mechanism.

The Paris Declaration on Carbon Pricing in the Americas, launched at the One Planet Summit held in December 2017, affirmed further development of carbon pricing in this region. With this declaration, 12 national and subnational governments in the Americas committed to implementing carbon pricing as a central policy instrument for climate change action, and to intensifying the regional integration of carbon pricing instruments. This was initially set out by a presidential declaration in Cali, Colombia, in which the Pacific Alliance leaders committed to building on a common transparency framework as the basis for a voluntary carbon market in the future.

Bolivia

Between 2004 and 2014, the Bolivian economy grew at an average annual rate of 4.9 %, driven by high commodity prices, the expansion of natural gas exports and prudent macroeconomic policy. More recently, GDP growth decreased from 6.8 % in 2013 to 4.2 % in 2017, due to a temporary reduction in the external gas demand. (World Bank, 2018).

The currently less favorable international situation brings structural challenges, such as gradually reducing the macroeconomic imbalances, optimizing the efficiency and progressivity of public spending, and ensuring sufficient returns from large investment projects. The situation also accentuates the importance of joining forces with the private sector to continue developing the country's potential in the energy sector. In addition, there is the challenge of mobilizing capital for sectors

that have traditionally been less attractive for private investors, including mining, agriculture and manufacturing (World Bank, 2018).

The National Economic and Social Development Plan (PDES) 2016-2020 was approved in 2016 with the objective of maintaining high growth, continuing to reduce poverty and improving access to basic services. This plan includes a broad public investment program financed by macroeconomic buffers, external financing and Central Bank loans. Among other areas, investment in infrastructure, hydrocarbon exploration, industrialization of natural gas, and thermo and hydroelectric energy generation are considered. The plan also calls for greater dynamism from the private-sector and for direct foreign investment.

PDES includes goals related to climate resilience and sustainable infrastructure, such as innovation in the production of food which aims to develop more nutritional foods while taking climate change and water irrigation management into consideration.

Bolivia's National Determined Contribution defines three thematic sets of targets related to water, energy and forests. With regard to water, the focus of actions is on adaptation to climate change and risk management, which includes several measures related to sustainable infrastructure. Development of resilient infrastructure for the production and service sectors, and the construction of coverage networks for drinking water and sewage are two examples. (UNFCCC, 2016c)

With regard to energy, Bolivia's target is to increase the proportion of renewable energy from 39% in 2010 to 79% by 2030. The set of targets in the Forests sector includes an increase in the contribution of this sector to 5.4% of the Gross Domestic Product (GDP) by 2030, boosted by agricultural and forestry production complementary to conservation through, for example, agricultural, forestry and agro-forestry production systems. It also aims to strengthen environmental functions (carbon capture and storage, organic matter and soil fertility, biodiversity conservation and water availability) in about 29 million hectares by 2030. Such goals can attract investments in green infrastructure, particularly nature based solutions.

6

Conclusions



Conclusions

There is potential to increase the flow of capital by way of all the financial mechanisms presented in this white paper, but there is even greater potential in combining finance products and actors. The findings of this white-paper show that in order to catalyse investment in sustainable infrastructure, a finance model that combines public, philanthropic and private investment is needed. The mobilization of capital for this kind of project can also come through the combination of climate finance, capital markets and Public-Private Partnerships (PPPs).

This trend is known internationally as blended finance, and has been encouraged by multilateral institutions such as the IDB and the OCDE to overcome the current obstacles to mobilizing private capital for sustainable development.

Blended finance must have three key characteristics: 1. Provides a financial return; 2. Focuses on Sustainable Development Goals (SDGs) or key development challenges such as climate change; 3. Attracts philanthropic financing.

The OCDE released guidelines regarding blended finance that can drive the efforts aiming to build an attractive portfolio of sustainable infrastructure projects in Latin American cities. Projects should: a) be rooted in a development rationale; b) mobilize private capital; c) take the local context into account; d) offer effective partnering; e) monitor for effectiveness and transparency.

These innovative approaches will be crucial for promoting a transformational investment shift, given that major decisions involving infrastructure investment have traditionally ignored climate change. For example, a study of World Bank showed that climate resilience is not being considered in public-private partner-ship

(PPP) policy frameworks for infrastructure, despite the fact that significant progress has been made by governments and multilateral development banks (MDBs) to develop policy frameworks, processes, tools and knowledge which promote climate resilience. Among the sample of 16 national PPP policy frameworks examined, not a single one was found to mention changing climate, climate resilience or adaptation. This report emphasizes the missed opportunity, and indeed the risk, that this omission represents (World Bank, 2016).

This shift in investment can be achieved by creating new market rules which aim to establish a long-term vision that can simultaneously help to reduce greenhouse gas emissions and to improve the quality of life.

This reinforces the urgent need to develop the technical and institutional capacity of local governments to set long term strategies rooted in sustainable development. These strategies should be translated into policies, incentives and projects to guide and stimulate the investment of the private sector. Transparency also plays a key role in creating the necessary conditions to mobilize more private capital for sustainable infrastructure, as many domestic and international private investors are extremely concerned with/are well aware of the risks involving corruption and governance. Reporting data - both financial and environmental - would also allow investors to continuously monitor the performance of subnational governments, as well as the impact of climate projects, which would make investments in this area more reliable.

Platforms for permanent dialogue, with working groups to address the obstacles identified in this white paper are desirable. These platforms can help to bring together the key-actors to pursue a common agenda in order to create an enabling environment for private investment in green infrastructure.

Some inspiring ideas for platforms of this kind include: Financial Innovation Labs,, led by the IDB in several countries including in Latin America, aiming to advance the agenda of financial mechanisms to promote sustainable development.

As an area for further research we also suggest investigating opportunities for investment in nature-based solutions for sustainable infrastructure projects. Some business case studies developed by The Nature Conservancy (TNC) of private sector and local governments' collaboration show sustainable infrastructure nature based solutions projects that have proved a positive return on investment. The cases included varied examples from a private entity solving a water treatment challenge with its installations, to a multi-stakeholder organization working together with a city to create a storm water management program, to a conservation organization working with governments and communities on coastal erosion control.

These case studies have shown that nature-based solutions are an essential element in increasing the resilience of industrial businesses. Investment in this area has also shown financial advantages when compared to gray infrastructure, due to the reduction of initial capital costs and current operating expenses, these financial savings that can be used to renew older assets. In addition, thanks to their regenerative processes, nature-based solutions consume less energy and are therefore less sensitive to fluctuations in energy prices when compared to gray infrastructure.

Given the comparative advantages of Latin American countries when it comes to natural resources, case studies like these could represent interesting investment opportunities for companies and investors, working in partnership with local governments to reduce pollution, improve health in cities and increase resilience to extreme weather events.

In view of these conclusions, we propose the following recommendations to address the obstacles and opportunities identified in this study:

Enablers for attracting private investment to sustainable investment:

1. Transparency

Private Investors should rely on data to make their decisions, so transparency regarding the cities' emissions and climate strategies is key to leveraging private investment for sustainable infrastructure. The reporting exercise is also helpful for identifying both the gaps and the major opportunities for reducing emissions, and build resilience to climate change. International public data platforms that engage both the public and private sectors, such as the CDP, contribute to the improvement of the transparency and the governance of cities.

2. Building capacity and knowledge to develop projects

This research indicates that accessing and attracting finance are some of the most significant obstacles that cities face when implementing their climate change plans, while the financial services industry reports a lack of understanding of climate projects deployed and experience in the financing models cities use to fund infrastructure projects. Therefore, there is an urgent need for capacity building within cities as well as for investors; sharing knowledge between these actors in cities and financial market can help to increase the capacity to develop, report and market bankable sustainable infrastructure projects.

3. Collaboration with other cities

Closer collaboration with cities may also help to increase the flow of capital investment, by grouping projects in order to make them more attractive to private investors. This collaboration among cities can work as an enabling tool for issuing

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green bonds and for diversifying the supply of climate projects that offer an attractive risk and return ratio for private investors. The CDP also provides a tool for benchmarking with a network of more than 600 cities worldwide as well as present climate projects to the 600 investors' network led by the organization. This exchange can bring insights into project opportunities and partnerships. As the cities are scored, there is also a clear incentive for local governments to make continuous improvements to their climate change management. The best practices are also identified and acknowledged, which can contribute to overcoming the obstacles identified in this paper regarding the lack of political support for climate projects, by further engaging the local government through recognition.

4. Matchmaking facility

Once there is a diversified supply of good projects, a Matchmaker facility can build bridges between cities and the private sector, thus helping to improve the communication, reporting, aggregation and marketing of projects to increase cities' collaboration with companies and investors. These facilities can be organized at different levels, as at the inter-municipal consortiums, or even at national and international levels.

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ANNEX I - Assessment of environment for private investment in five Latin American countries

	Argentina	Bolivia	Chile	Colombia	Peru
S&P Credit Rating	B	BB-	A+	BBB-	BBB+
Fitch Credit Rating	B	BB-	A	BBB	BBB+
Moody's Credit Rating	B2	Ba3	A1	Baa2	A3
Issuing of subnational bonds allowed	Yes ¹	Yes (only in La Paz) ²	Yes ³	Yes ⁴	Yes ⁵
GDP growth (annual percentage)	1.6	4.2	3.4	3.6	4.1
Inflation rate (annual percentage)	31.7	4.2	3	3.4	2
Ease of doing business ranking	117/190	152/190	55/190	59/190	58/190
Corruption perceptions index 2017	85/180	112/180	26/180	96/180	96/180
Global Competitiveness Report 2017-2018 Ranking (which include an Infrastructure score)	61/138	Not score due to insufficient data	33/138	61/138	67/138

Credit rating for reference:

Grade	Moody's	S&P	Fitch
Prime	Aaa	AAA	AAA
High grade	Aa1	AA+	AA+
	Aa2	AA	AA
	Aa3	AA-	AA ⁻
Upper medium grade	A1	A+	A+
	A2	A	A
	A3	A-	A ⁻
Lower medium grade	Baa1	BBB+	BBB+
	Baa2	BBB	BBB
	Baa3	BBB-	BBB-
Non-investment grade, speculative	Ba1	BB+	BB+
	Ba2	BB	BB
	Ba3	BB ⁻	BB-

ANNEX II - Survey sent to cities

City	Country	Response
Aipromades Lago de Chapala	Mexico	public
Alcaldía de Barrancabermeja	Colombia	public
Alcaldía de Cartago	Colombia	public
Alcaldía de Cuenca	Ecuador	public
Alcaldía de Floridablanca	Colombia	non public
Alcaldía de Ibagué	Colombia	public
Alcaldía de Leticia	Colombia	public
Alcaldía de Madrid	Colombia	non public
Alcaldía de Montería	Colombia	public
Alcaldía de Mosquera	Colombia	non public
Alcaldía de Palmira	Colombia	public
Alcaldía de Panamá	Panama	public
Alcaldía de Rionegro	Colombia	public
Alcaldía de Sopó	Colombia	public
Alcaldía de Tegucigalpa	Honduras	public
Alcaldía de Tulua	Colombia	public
Alcaldía de Tunja	Colombia	non public
Alcaldía Distrital de Barranquilla	Colombia	non public
Alcaldía Distrital de Cartagena de Indias	Colombia	public
Alcaldía Distrital de Santa Marta	Colombia	non public
Alcaldía Municipal La Paz	Honduras	non public
Alcaldía de Sincelejo	Colombia	public
Ayuntamiento de Chihuahua	Mexico	public
Ayuntamiento de Casimiro Castillo	Mexico	non public
Ayuntamiento de Degollado	Mexico	public
Ayuntamiento de Ixtlahuacán del Río	Mexico	non public
Ayuntamiento de La Barca	Mexico	public
Ayuntamiento de Naucalpan de Juárez	Mexico	public
Ayuntamiento de Tuxcueca	Mexico	public
Ayuntamiento de Xalapa	Mexico	public
Bogotá Distrito Capital	Colombia	public
CIOESTE	Brazil	public
City of Brasília	Brazil	non public
City of Buenos Aires	Argentina	public

City of Goiânia	Brazil	public
City of Guadalajara	Mexico	public
City of Salvador	Brazil	non public
Ciudad de Asunción	Paraguay	public
Ciudad de Juárez	Mexico	public
Ciudad de Mendoza	Argentina	public
Comuna de Ataliva	Argentina	public
Distrito Metropolitano de Quito	Ecuador	public
Gobernación del Archipiélago de San Andrés	Colombia	public
Gobierno Autonomo de Cochabamba	Bolivia	non public
Gobierno Autónomo Municipal de Tarija	Bolivia	public
Guatemala City	Guatemala	non public
Intendencia de Montevideo	Uruguay	non public
J. I. de Medio Ambiente de la Costa Sur (JICOSUR)	Mexico	public
J. I. de Medio Ambiente de Sierra Occidental y Costa	Mexico	non public
J. I. de Medio Ambiente Region Valles (JIMAV)	Mexico	public
Metropolitan Municipality of Lima	Peru	public
Mexico City	Mexico	public
Municipalidad de Concepción	Chile	non public
Municipalidad de Tampico	Mexico	non public
Municipalidad de Córdoba	Argentina	public
Municipalidad de Belén	Costa Rica	non public
Municipalidad de Colina	Chile	public
Municipalidad de Comas	Peru	public
Municipalidad de General Alvear (Mendoza)	Argentina	public
Municipalidad de Independencia	Chile	public
Municipalidad de La Paz	Bolivia	non public
Municipalidad de La Serena	Chile	non public
Municipalidad de La Unión	Costa Rica	non public
Municipalidad de Magdalena del Mar	Peru	public
Municipalidad de Miraflores	Peru	public
Municipalidad de Peñalolén	Chile	non public
Municipalidad de Pica	Chile	non public
Municipalidad de Providencia	Chile	public
Municipalidad de Provincial de Arequipa	Peru	public
Municipalidad de Puerto Barrios	Guatemala	public
Municipalidad de Rio Grande	Argentina	public
Municipalidad de San Borja	Peru	non public

Municipalidad de San Isidro (Argentina)	Argentina	public
Municipalidad de San Isidro (Lima)	Peru	public
Municipalidad de San José	Costa Rica	public
Municipalidad de Santiago	Chile	public
Municipalidad de Santiago de Surco	Peru	public
Municipalidad de Vicente López	Argentina	public
Municipalidad de Zacatecoluca	El Salvador	non public
Municipality of Belém	Brazil	public
Municipality of Belo Horizonte	Brazil	public
Municipality of Campinas	Brazil	public
Municipality of Curitiba	Brazil	public
Municipality of Fortaleza	Brazil	public
Municipality of Medellín	Colombia	public
Municipality of Porto Alegre	Brazil	public
Municipality of Recife	Brazil	public
Município de Aparecida	Brazil	public
Municipio de Arboletes	Colombia	non public
Municipio de Bucaramanga	Colombia	public
Municipio de Chorrera	Panama	public
Municipio de Loja	Ecuador	non public
Municipio de Mérida	Mexico	public
Municipio de San Pedro de Urabá	Colombia	public
Municipio de Torreón	Mexico	public
Municipio Distrital del Rimac	Peru	public
Prefeitura da Estância Climática de São Bento do Sapucaí	Brazil	public
Prefeitura da Estância Turfística de São Roque	Brazil	public
Prefeitura de Angra dos Reis	Brazil	public
Prefeitura de Aracaju	Brazil	public
Prefeitura de Bayeux	Brazil	public
Prefeitura de Bertioga	Brazil	public
Prefeitura de Betim	Brazil	public
Prefeitura de Blumenau	Brazil	non public
Prefeitura de Bonito	Brazil	public
Prefeitura de Botucatu	Brazil	public
Prefeitura de Brotas	Brazil	public
Prefeitura de Brumadinho	Brazil	public
Prefeitura de Brusque	Brazil	public
Prefeitura de Cajamar	Brazil	public

Prefeitura de Campina Grande	Brazil	public
Prefeitura de Campo Grande	Brazil	non public
Prefeitura de Campos de Goytacazes	Brazil	non public
Prefeitura de Cruzeiro do Sul	Brazil	public
Prefeitura de Cuiabá	Brazil	non public
Prefeitura de Extrema	Brazil	public
Prefeitura de Feira de Santana	Brazil	non public
Prefeitura de Fernandópolis	Brazil	non public
Prefeitura de Florianópolis	Brazil	public
Prefeitura de Guarujá	Brazil	public
Prefeitura de Guarulhos	Brazil	non public
Prefeitura de Itatiba	Brazil	non public
Prefeitura de Jahu	Brazil	public
Prefeitura de Jundiá	Brazil	non public
Prefeitura de Limeira	Brazil	public
Prefeitura de Londrina	Brazil	public
Prefeitura de Lorena	Brazil	public
Prefeitura de Maceió	Brazil	public
Prefeitura de Manaus	Brazil	non public
Prefeitura de Morungaba	Brazil	non public
Prefeitura de Natal	Brazil	public
Prefeitura de Osasco	Brazil	public
Prefeitura de Palmas	Brazil	non public
Prefeitura de Pirenópolis	Brazil	public
Prefeitura de Porto Velho	Brazil	public
Prefeitura de Presidente Prudente	Brazil	public
Prefeitura de Rio Branco	Brazil	public
Prefeitura de Rio Verde	Brazil	public
Prefeitura de Santa Barbara d'Oeste	Brazil	non public
Prefeitura de Santo André	Brazil	non public
Prefeitura de São João da Boa Vista	Brazil	non public
Prefeitura de São Leopoldo	Brazil	public
Prefeitura de São Luís	Brazil	non public
Prefeitura de São Paulo	Brazil	public
Prefeitura de São Sebastião	Brazil	public
Prefeitura de Sorocaba	Brazil	public
Prefeitura de Tangará da Serra	Brazil	public
Prefeitura de Tatuí	Brazil	public

Prefeitura de Tremembé	Brazil	non public
Prefeitura de Tupã	Brazil	public
Prefeitura de Vinhedo	Brazil	public
Prefeitura de Vitória	Brazil	public
Prefeitura do Município de Maringá	Brazil	non public
Prefeitura do Rio de Janeiro	Brazil	public
Prefeitura Municipal da Estância Turística de Olímpia	Brazil	public
Prefeitura Municipal de Aparecida de Goiânia	Brazil	public
Prefeitura Municipal de Araçatuba	Brazil	public
Prefeitura Municipal de Araraquara	Brazil	public
Prefeitura Municipal de Bauru	Brazil	non public
Prefeitura Municipal de Boa Vista	Brazil	public
Prefeitura Municipal de Cabreúva	Brazil	non public
Prefeitura Municipal de Caieiras	Brazil	public
Prefeitura Municipal de Canoas	Brazil	public
Prefeitura Municipal de Cascavel	Brazil	non public
Prefeitura Municipal de Cerquillo	Brazil	non public
Prefeitura Municipal de Cotriguaçu	Brazil	public
Prefeitura Municipal de Cubatão	Brazil	non public
Prefeitura Municipal de Franco da Rocha	Brazil	public
Prefeitura Municipal de João Pessoa	Brazil	public
Prefeitura Municipal de Juruena	Brazil	public
Prefeitura Municipal de Macapá	Brazil	non public
Prefeitura Municipal de Mairiporã	Brazil	non public
Prefeitura Municipal de Petrolina	Brazil	non public
Prefeitura Municipal de Porto Feliz	Brazil	non public
Prefeitura Municipal de Santos	Brazil	public
Prefeitura Municipal de São José dos Campos	Brazil	public
Prefeitura Municipal de São Vicente	Brazil	public
Prefeitura Municipal de Sertãozinho	Brazil	public
Prefeitura Municipal de Sumaré	Brazil	non public
Prefeitura Niterói	Brazil	public
Región Metropolitana de Santiago	Chile	public
Santa Cruz de Galápagos	Ecuador	non public
Santiago de Cali	Colombia	public
Santiago de Guayaquil	Ecuador	public

ANNEX III - Survey sent to cities

1. In what areas is your city seeking funding? At what stage is the project?

- a. The. Energy efficiency / retrofit
 - Scope
 - Pre-feasibility stud
 - Pre-deployment / Deployment
 - Operation
 - Deployment completed
 - Monitoring and Reporting
- b. Public lighting / traffic lighting
- c. Renewable energies (solar, wind)
- d. Low emission public transport
- e. Energy Efficiency
- f. Bus rapid transit (BRT)
- g. Non-motorized transport solutions and / or active mobility
- h. Waste Management
- i. Rainwater management
- j. Management and supply of drinking water
- k. Green solutions for thermal comfort
- l. Pervious floors
- m. Management of urban river basins
- n. Urban tree planting
- o. Public spaces (parks, squares, leisure areas)
- p. Infrastructure works in areas of geological risk
- q. Removal of population in areas of geological risk
- r. Construction of low-emission housing
- s. Other (please specify)

2. In what form does your city receive private investment?

- a) Public-Private Partnerships (PPP's)
- b) Consortia
- c) Capital market through issuance of debentures (if applicable for the legal context of the country)

- d) Cooperation agreements with national and international agencies
- e) Investment Partnership Programs (PPI's)
- f) NAMAS - Nationally Appropriate Mitigation Action
- g) Donations
- h) Environmental compensations
- i) Other: please specify

3. Does your city have any Public-Private Partnership (PPP), consortium or other active arrangements with the private sector?

- a. Yes: please specify
- b. No

4. What are the main barriers to private sector investment?

- a. Lack of technical and institutional capacity
- b. Lack of political support for green projects
- c. Difficulty in meeting the requirements of private investors (governance structure, documents, technical and economic-financial information)
- d. Changes in management
- e Lack of integration / dialogue between departments
- f. Legal restrictions and administrative barriers
- g. Insufficiency of specific subsidized financing lines for local governments
- h. Low debt capacity of local governments
- i. Federal barriers to local government access to international financing
- j. Others

ANNEX IV - Survey for investors

Climate resilient infrastructure projects - low-carbon and resilient infrastructure (LCR)

Contact information

1. Name of the organization
2. Country
3. First Name, Surname
4. Email
5. Phone number

Survey Questions

1. Do you invest in green, sustainable, or low-carbon infrastructure in Latin America?

- a. No
- b. Intend to.
- c. Yes

If no:

2. What are key constraints /barriers investing to in Latin America green infrastructure?

- a. Cities often lack the capacity or knowledge to develop and report bankable projects
- b. Unclear municipal counterparty.
- c. Difficulty in determining concessionary financing, tax regime, or loan guarantee options.
- d. Lack of performance-based track record with previous, existing, or future projects.
- e. Uncertain, unclear, or low credit worthiness.
- f. Country-level credit rating concerns.
- g. Risk of political interference.
- h. Lack of cooperation between sectors, pro-

jects and public and private actors

- i. Costs outweigh returns.
- j. Insufficient number or scale of projects.
- k. Insufficient or inadequate investment vehicles to fund projects.
- l. Projects are illiquid with no apparent exit strategy / off-taker.
- m. Long-term currency risk management.
- n. Other: please specify

Comments:

If yes:

3. Which category of areas/products:

- a. Energy efficiency / retrofit
- b. Outdoor lighting
- c. On-site renewable energy
- d. Local renewable energy
- e. Low carbon transport systems
- f. Bus rapid transit
- g. Traffic demand management systems
- h. Bike share systems
- i. Waste management
- j. Waste recycling
- k. Storm water management
- l. Potable water management
- m. Building automated systems (dashboards)
- n. Green roofs
- o. Permeable street paving
- p. Bioswales, rain gardens and planter boxes
- q. Urban tree canopy
- r. Constructed wetlands
- s. Urban watershed management
- t. Biophilia

u. Other: please specify

4. How many funds invest in these categories of areas/products in Latin America

- a. 0
- b. 1-3
- c. 4-6
- d. Over 6

Comments:

5. What percentage of your investment portfolio is allocated to these categories of areas/products?

- a. 0
- b. 0-5
- c. 5-10
- d. 10 – 20
- e. 20-30
- f. Over 30

Comments:

6. Which countries and cities are you interested in?

6.1 Argentina

- a. Buenos Aires
- b. Cordoba
- c. Mendoza
- d. Other: please specify

6.2 Bolivia

- a. La Paz
- b. Cochabamba
- c. Other: please specify

6.3 Brazil

- a. São Paulo
- b. Rio de Janeiro
- c. Belo Horizonte
- d. Campinas
- e. Fortaleza
- f. Sorocaba
- g. Recife
- h. Brasilia
- i. Other: please specify

6.4 Chile

- a. Santiago Metropolitan
- b. Other: please specify

6.5 Colombia

- a. Medellin
- b. Cali
- c. Barranquilla
- d. Bogota
- e. Cartagena
- f. Monteria
- g. Other: please specify

6.6 Peru

- a. Metropolitan Lima
- b. Arequipa
- c. Cajamarca
- d. Other: please specify

6.7 Mexico

- a. Mexico City
- b. Guadalajara

- c. Mérida
- d. Puebla
- e. Other: please specify

6.8 Other city in Latin America: please specify the name of the city and country

If you intend to invest:

1. What are key objectives investing in Latin American green infrastructure?

- a. Specific return on investment
- b. Expansion of/in this market
- c. Meeting ESG or portfolio requirements
- d. Building relationship with a specific business or government
- e. Other (please specify)

2. What investment criteria do you consider for investment in municipalities?

- a. Ability to obtain concessionary finance (e.g. green bonds, loan guarantees, favorable tax status, etc.)
- b. Track record or history of similar project development
- c. Credit rating history
- d. Risks: Geopolitical, economic, policy (please specify)
- e. Other: please specify

3. In your opinion, which of the following could help the redirection of capital from the private sector to green infrastructure projects in cities?

- a. Municipal bonds.
- b. Green bonds
- c. Infrastructure project financing

- d. Public-Private Partnerships
- e. Local PRIVATE high-net worth or institutional investors looking for local investments.
- f. Other: please specify

4. What are key constraints /obstacles to investing in Latin American?

- a. Liquidity risk at portfolio level
- b. Legal / regulatory
- c. Time constraints horizon
- d. Taxes
- e. General macroeconomic risk (currency, inflation...)
- f. General political risk
- g. Other: please specify

5. What are the unique constraints of your portfolio investing in Latin America?

- a. Gender issues
- b. SDG
- c. Climate change mitigation
- d. Return guarantees
- e. Ownership risk (must own either majority or minority of a project)
- f. Other: please specify

6. Which countries and cities are you interested in?

- 6.1 Argentina
 - a. Buenos Aires
 - b. Cordoba
 - c. Mendoza
 - d. Other: please specify

6.2 Bolivia

- a. La Paz
- b. Cochabamba
- c. Other: please specify

6.3 Brazil

- a. São Paulo
- b. Rio de Janeiro
- c. Belo Horizonte
- d. Campinas
- e. Fortaleza
- f. Sorocaba
- g. Recife
- h. Brasilia
- i. Other: please specify

6.4 Chile

- a. Santiago Metropolitan
- b. Other: please specify

6.5 Colombia

- a. Medellin
- b. Cali
- c. Barranquilla
- d. Bogota
- e. Cartagena
- f. Monteria
- g. Other: please specify

6.6 Peru

- a. Metropolitan Lima
- b. Arequipa
- c. Cajamarca

d. Other: please specify

6.7 Mexico

- a. Mexico City
- b. Guadalajara
- c. Mérida
- d. Puebla
- e. Other: please specify

6.8 Other cities in Latin America: please specify the name of the city and country



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