

White Paper: Barriers to Private Sector Investments into Urban Climate Mitigation Projects

Elucidating barriers and solutions for cities to access finance to scale-up climate mitigation efforts

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LoCaL aims to reduce 1 Gt of CO₂ and mobilize €25 billion of climate finance for cities annually by 2050. LoCaL is an innovation platform aiming to provide cities with better tools for assessing greenhouse gas emissions, planning, investing and evaluating progress. Started in 2015, LoCaL is a growing community of more than 20 organisations dedicated to unlocking climate finance for cities. This paper was realized as part of the project Climate Financier under LoCaL and conducted by CDP. LoCaL is a Climate-KIC flagship programme.

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About Climate-KIC

Climate-KIC is the EU's largest public private partnership addressing climate change through innovation to build a zero carbon economy. We address climate change across four priority themes: urban areas, land use, production systems, climate metrics and finance. Education is at the heart of these themes to inspire and empower the next generation of climate leaders. We run programmes for students, start-ups and innovators across Europe via centres in major cities, convening a community of the best people and organisations. Our approach starts with improving the way people live in cities. Our focus on industry creates the products required for a better living environment, and we look to optimise land use to produce the food people need.

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1. Executive Summary

This paper uses an extensive literature review and 18 in-depth semi-structured interviews with city representatives, investors and other stakeholders and three questionnaire responses (Appendix A) to identify the main barriers for investment into urban mitigation projects and understand how these can be overcome.

Key findings:

- Cities have an important role to play in climate change mitigation, as 75% of all greenhouse gas emissions occur in cities, and cities offer economies of scale and co-benefits to make climate mitigation projects cost-effective.
- The interviews show that there is an advantage for cities to market their projects as ‘mitigation projects’ due to increased private sector interest in financing climate investments. We conclude that capital is available but there is a lack of bankable projects, due to four main barriers:
 - Barrier 1: Cities often lack the capacity or knowledge to develop and report bankable projects that are competitive with non-mitigation projects in attracting finance.
 - Barrier 2: A perceived lack of mandate from the electorate, and a lack of understanding by cities that climate mitigation projects can reduce and avoid costs, resulting in low political will in the city to drive the climate change agenda forward.
 - Barrier 3: Most projects require close cooperation between sectors, projects and public and private actors to aggregate smaller projects and to overcome the challenges mentioned above. Interviewees state that aligning different parties is often a limiting factor for increased investment in urban mitigation projects.
 - Barrier 4: A lack of a track record or low credit worthiness exacerbates barrier 1 in most of the developing world.
- This paper suggests that a ‘match-making facility’ between investors and cities could help cities access the capital needed for them to lock into a two degree pathway. Such a facility would help cities realize they can reduce costs, facilitate the reporting on and marketing of projects in a standardized way, and promote collaboration between parties to enable more flexible financing of urban mitigation projects.

2. Climate action in cities

2.1 Cities' role in global mitigation efforts

Cities will play a crucial role in ensuring the world will stay below two degrees Celsius warming compared to pre-industrial levels, as acknowledged at the COP21 in Paris (UNFCCC Newsroom, 2015). Not only do urban mitigation efforts have a disproportionate effect compared to other measures, due to cities' density and economies of scale, but significant cost reductions and co-benefits occur when aiming for carbon reductions within cities (OECD 2012; UNEP, 2014).

Today 75% of greenhouse gas (GHG) emissions and 80% of energy use globally are attributable to cities. Already half of the world's population lives in urban areas and this is predicted to grow significantly. To cut global emissions, cities must scale up projects to mitigate climate change which entails developing renewable energy capacity, building sustainable transport infrastructure, improving waste management and increasing energy efficiency in the built environment (CDP, 2015; Merk et al., OECD, 2012). This white paper researches these four categories of urban mitigation projects, i.e. projects that reduce GHG emissions within cities. These climate mitigation actions in cities have co-benefits on health, quality of life and economic activity, as described in section 2.3 below.

2.2 Climate finance for cities

Public sector finance is insufficient for climate goals

Despite the important role that cities must play to reduce global emissions, their ability to finance climate change mitigation efforts is limited. Between 2010 and 2014 "only 1 out of every 10 dollars of total climate finance" was allocated to cities (Barnard, ODI, 2015; Gold Standard, 2014). Standard & Poor's and the OECD predict that approximately 57 trillion USD is needed to finance the global infrastructure requirements between 2013 and 2030 (Long Finance and WWF, 2015), while the Gold Standard predicts that to stay within two degrees, 93 trillion USD of investments is required for low-carbon infrastructure and activities over the next 15 years (Gold Standard, 2014, Long Finance and WWF, 2015). The global public sector is unable to cover these costs due to already high levels of debt and deficits in public budgets, which means significant finance from private investors is needed (Long Finance and WWF, 2015; UN Habitat and ICLEI, 2012).

Although the public sector is unable to fully finance climate mitigation in cities, it has a key role in creating enabling conditions that can help cities secure the required private sector investments. Currently the public sector invests 842 million USD in sustainable (i.e. low-carbon) infrastructure,

which could play an important role in leveraging and scaling-up private sector investments into similar projects (Barnard, ODI, 2015). For example, public finance could enhance a city's credit history and deliver risk guarantees to make investments more attractive to private actors through public-private partnerships (PPPs) and green bonds. PPPs are contracts between a private party bringing in expertise, capital and ability to carry risks and a public party that can deliver guarantees to lower risks. Such a partnership can help a city reduce the amount of money it needs to borrow (CDIA, 2010). Green bonds are fixed-income tools issued by for example a city that are ring-fenced for mitigation activities (CBI, 2015).

Advantage of financing urban mitigation projects

Urban climate mitigation actions have co-benefits on health and quality of life, as they can result in cleaner air, more efficient transport systems and improved waste management (CDP, 2015; UNEP, 2014; Merk et al., OECD, 2012; Gold Standard, 2014). In addition, financing urban mitigation projects in cities has economic benefits. Cities offer density and economies of scale that can make mitigation projects cost-effective. Another positive co-benefit of investing in mitigation projects within cities is the increase of urban economic activity, as “well-designed, dense, compact and connected cities” are associated with more “sustainable living patterns, and cities offer scale” to reduce costs (Dalkmann, 2014).

Finally, greening existing necessary investments into infrastructure can avoid capital costs for the city (Kennedy et al., OECD, 2012; UNEP, 2014). According to a WRI study, compact urban development could reduce global infrastructure costs by more than 3 trillion USD over the next 15 years by reducing urban sprawl and pollution. Greening cities can also reduce costs associated with congestion (4% of GDP in Cairo, 3.4% in Buenos Aires), urban sprawl (\$400 billion annually in extra infrastructure, public service and transport costs in North-America) and social costs of motorized transport (15% of GDP in Beijing) (Dalkmann, WRI, 2014).

The advantages of financing urban mitigation projects described in this section can help cities incorporate climate mitigation aspects into project design, and market these projects to investors who are interested in financing climate mitigation. This will be discussed further in section 4.2.

Trends in private sector interest in climate projects

There is an increased appetite for ‘green’ and ‘climate’ projects from the private sector (Forster, 2014; World Bank, 2015, WRI, 2015). The interviewees agreed that liquid capital to fund urban mitigation projects is available, and that the lack of private investment in urban climate mitigation is largely due to the shortage of bankable projects (as discussed in section 3).

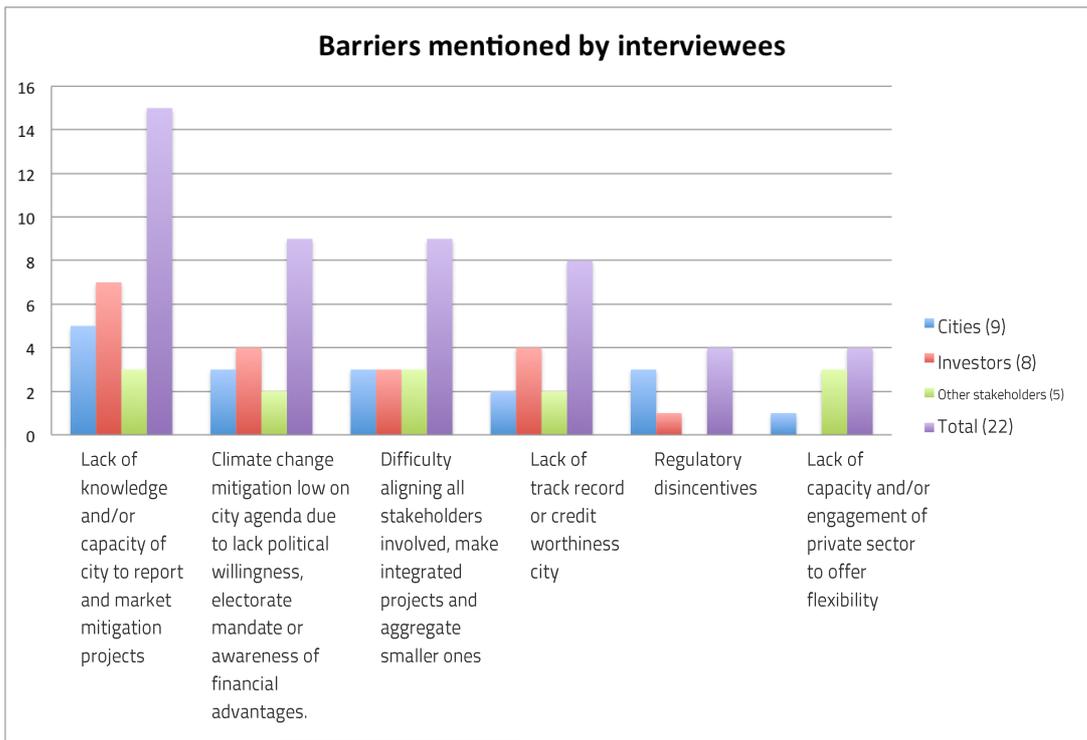
Two growing trends amongst private investors pose opportunities for financing urban mitigation projects: impact and responsible investment (Wood, Initiative for Responsible Investment, 2011).

- Impact investment is the movement to investments that, in addition to a solid financial return, also have “intended, specified and tangible social and/or environmental benefits”. As climate mitigation projects have clear social and environmental benefits

and as cities offer innovation and high impact targets, impact investment seems very relevant for urban mitigation projects (Wood, 2011).

- Responsible investment comes primarily from large institutional investors (e.g. pension or sovereign wealth funds) looking for long-term investments “with broader objectives of having a positive effect on the society”. City mitigation projects are suitable as they offer “scale, positive externalities and long-term horizons” (Wood, 2011).

3. Barriers to investment



This section discusses the four main barriers identified by the interviewees. The interviewees and questionnaire responses consist of city representatives (9), private investors (8) and other stakeholders (5) (see Appendix A). The chart above summarises the most significant barriers for financing urban mitigation projects as identified by the interviewees. The following are the top four barriers identified:

1. Lack of knowledge and/or capacity of cities to report and market mitigation projects (56% cities, 88% investors, 60% other stakeholders, 68% total)
2. A perceived lack of mandate from the electorate, and a lack of understanding by cities that climate mitigation projects can reduce and avoid costs, resulting in low political will in the city to drive the climate change agenda forward. (33% cities, 50% investors, 40% other stakeholders, 41% total)
3. Difficulty aligning all stakeholders involved to execute integrated and aggregated projects (33% cities, 38% investors, 60% other stakeholders, 41% total)
4. Lack of track record or credit worthiness of cities (22% cities, 50% investors, 40% other stakeholders, 36% total)

Interviews and questionnaires were carried out prior to, during and after Paris COP21 and conducted in English. Interviews were in-depth and semi-structured, using a question list designed after an extensive literature review. Limitations of the interviews include language barriers leading to most interviewees based in Europe and North America. This occurred mostly for investors, due to a wide network of investors via CDP located in North America. This could potentially limit the results of the study through an unrepresentative selection of interviewees.

3.1 Barrier 1: knowledge and reporting

As discussed in section 1, interviewees agreed that it is not a lack of capital, but a lack of bankable projects that limits investment in urban climate mitigation. The primary reason mentioned for this lack of bankable projects is cities' lack of capacity to develop, report on and market mitigation projects with financial returns that can compete with the returns of other non-mitigation projects.

This lack of knowledge and capacity to develop climate mitigation projects that are bankable is present both on the city side and the investor side. Most interviewees mention that both cities and investors are unclear about what is expected of them by the other party. While cities mention the lack of understanding of what information investors require, investors mention missing financial data, emissions or other Environmental, Social and Governance (ESG) information from cities, emissions reduction commitments by cities, and cities' inability to demonstrate a track record of developing projects with a financial return and their credit history.

Project reporting by cities is insufficient

The barrier mentioned most frequently by interviewees was cities' lack of knowledge of investors' requirements and the lack of capacity to report and quantify non-financial information on mitigation projects. According to one interviewee *"especially second and third tier European cities, and cities in developing countries, do not know what to expect from investors or public-private partnerships"*.

Before making investment decisions on a mitigation project, investors require detailed reporting on both the financial and sustainability elements of a project, as well as an understanding of the city's commitments for the future. In many cases, the cities either do not know what documents and data are needed by investors or- in the case of smaller cities- they lack capacity to fulfil these requirements. Many interviewees mention technical or administrative assistance by third parties or experts as an effective way to overcome this barrier.

Current reporting by cities varies significantly and is generally not comparable across projects. One investor interviewee highlighted the need to communicate with cities directly to request information as a way to increase the supply of information. There is a need for a standardised market for information to build a common understanding of what information is required by investors.

Box 1: Data reporting requirements from investors

Both the literature and interviewees identify a knowledge gap on the reporting required by investors. The following is the information needed by investors, as a minimum, to allow them to evaluate whether to invest in a project (ordered from most to least mentioned).

- **Financial feasibility reports (major costs, income, payback period, shareholders)**
- **Impact analysis (environmental, economic and social impacts)**
- **Credit worthiness rating of local government**
- **Project monitoring and evaluation plan**
- **Technical feasibility report (technical maturity, intellectual property rights, ownership)**
- **Due diligence report**
- Gap analysis, context analysis (necessity of proposed project)
- Contracts: technology property protection, energy performance, supply, insurance, power purchase agreements
- Land use permits, construction permits, bid documents
- Climate risk and hazard analysis of the proposed city or region
- Higher government's endorsement letter

Box 1 (on page 6) lists the data reporting requirements from investors as indicated in literature and interviews.

Additionally, interviewees mention the need for a sound rule of law to enable cities to fulfil the reporting requirements in a robust and transparent manner.

While most interviewees identified insufficient reporting by cities as one of the biggest barriers to investments, they also indicate that reporting by cities has improved in the last few years. For example, 308 cities reported to CDP's 2015 disclosure process (CDP Data, 2015). Financial reporting by cities, in particular in North-America, has become more detailed, timely and standardized since the financial crisis.

Private investors do not fully understand how to encourage the development of urban mitigation projects

It is clear from the interviews that private sector actors need a better understanding of the trade-offs between increased reporting requirements and financial returns, as well as more experience in leveraging public-private partnerships to optimum effect.

As previously indicated, there is an increased appetite from the private sector to invest in 'greener' options, e.g. compact urban development rather than urban sprawl, or renewable energy rather than fossil fuels. This requires better reporting of environmental information. One investor mentioned the fear of 'greenwashing' which led the firm to use third party verification to ensure the environmental credentials of a project. Other investors mentioned the lack of city-wide and ambitious targets to reduce emissions beyond the scope of the individual project as a barrier for their investment.

While seven out of eight investors mentioned the lack of reporting as a barrier, only one of them mentioned that extra reporting requirements might add cost premiums and higher transaction costs that could make projects less competitive. This interviewee also mentioned that the 'mitigation project market' is illiquid as it is still young, which also discourages investments. These appropriation constraints for mitigation projects should be considered when setting reporting standards for cities and designing assistance programs for reporting.

Consequences of barrier 1: large, mature and measurable projects win

The consequence of barrier 1 is that early-phase, smaller and 'soft' projects, as well as projects that use novel technologies, have more difficulty accessing finance streams than larger, mature and easily quantifiable projects, e.g. mass transit systems where there is predictable demand and where financial returns from user charges can be calculated.

It is difficult to estimate financial returns accurately for early-phase projects. To spread the risk associated with these projects, cities should look to fund several parts of the project together, which includes the construction and implementation phases, as well as the early phase of planning and design. Changing how these projects are defined is possible, but requires early partnerships and dynamic relationships.

Smaller projects are also harder to fund, as are projects in smaller cities, which often lack the capacity to report to a high level of detail. Small projects consist of those below 1 million USD according to most investors, while projects between \$25-50 million are easier to find funding for.

Interviewees mentioned that 'soft' mitigation projects, i.e. project that do not require new infrastructure to be built, offer opportunities to reduce emissions without focusing on building new infrastructure, which can provide relatively easy 'wins' for the city. However, at present city authorities are generally unaware of the emissions reduction benefits that 'softer' measures provide and that they can seek to secure financing for these projects. Examples include projects where the private sector might find returns from improved fares of public transport or returns may be paid by the government for energy efficiency achievements (Allen et al., 2015).

According to the OECD, urban green projects with high capital intensity and high technology risk are the most difficult to finance (Merk et al., OECD, 2012). City questionnaire responders to this research (3 responses) claim that financing emerging technologies is a challenge.

3.2 Barrier 2: Climate change mitigation low on city agenda

Several of the interviewees mention the lack of mitigation projects due to low priority on the city agenda as a key barrier. The interviewees attribute this to the lack of cities' electoral mandate and/or willingness to act on climate change, or their difficulty in prioritizing climate change projects over other urban projects.

Interviewees gave different reasons for the lack of political will from cities to develop mitigation projects, including:

- Cities believe the costs for ‘green’ projects are higher and as stewards of tax-payer money they want to be careful in driving this agenda forward.
 - Several US cities mention a lower interest in (green) bonds issuance due to the ‘fear of debt’ that is engrained in the public sector because of previous financial crises.
 - An interviewee mentions that in Asia there is a perception of a lower return for ‘green’ or ‘mitigation’ projects regardless of the actual predicted return.
- The majority of the interviewees, especially investors, cite the lack of understanding on the city side that developing low-carbon projects can reduce and avoid costs.
 - In the transport sector, one stakeholder mentions that often cities do not understand that “we cannot build our way out of congestion” and that other ‘softer’ measures, such as promotion of cycling, parking permits or technology in the transport sector, also need to be higher on the agenda because of their potential to reduce carbon emissions with lower upfront capital costs.
- Lack of leadership and teams in cities to drive the climate change agenda
 - Many cities are afraid that voters will not agree with a ‘climate change’ agenda or with issuing ‘green bonds’, e.g. in California there needs to be a two-thirds vote before a council or municipality can issue (green) bonds.
 - Lack of leadership and an apprehension about moving forward when national climate change policy is not ambitious or is misaligned with the city’s expectations.

However, most interviewees mention the growing trend among cities to focus on the services which they supply to their population and their ability to influence the long-term sustainability of these services through an assessment of the carbon impacts of all planned projects, better marketing of projects to investors and potential cost-savings for the city.

Box 2: Canberra (Australia) shows that being a front-runner can pay off

Canberra has set ambitious greenhouse gas reduction targets, despite the Australian government’s low priority for this issue. Canberra reported to CDP to aim to reduce carbon emissions by 80% by 2050 compared to 1990 levels (CDP, 2015). As the City of Canberra has a triple A credit rating, the active marketing and integration of climate mitigation into their projects received a lot of investment interest from the private sector who increasingly had a mandate from their clients to find ‘responsible’ or ‘impact’ investments. Through several programs, including a reverse option process for renewable energy, Canberra showed that being a frontrunner and leader in climate action could pay off. However, the City is aware that the higher reporting and appropriation requirements and relative immaturity of green projects can cause higher transaction costs, lower liquidity and cost premiums that might make projects less competitive with other alternatives.

This case study illustrates that the private sector has an interest in climate mitigation projects and that actively developing projects towards this interest at an early stage can increase investments.

3.3 Barrier 3: Difficulty in aligning all parties involved

Most interviewees highlighted that climate mitigation projects heavily depend on cooperation between actors across sectors to successfully access finance.

This is due to several reasons:

- **Lack of public finance and co-dependency finance:** Public finance is insufficient to cover all costs needed for a two degree pathway. Public finance therefore has to be able to leverage private sector investment through, for example, public-private partnerships (PPPs) as described in section 2.2. PPPs have the advantage over green bonds in that they do not need a voter majority. Moreover, PPPs offer the possibility of more dynamic partnerships, use of private sector expertise and lower risk with guarantees from the public side. However, PPPs require a clear understanding of what is needed and expected from both parties, which is often a barrier. In some cases there is even cooperation between private sector actors, i.e. consortia, needed to overcome cost barriers or attract the right areas of expertise (Allen et al., GIZ/SloCaT, 2015). Public finance is often also co-dependent, i.e. funding will only become available if it is matched with funding from other sources and thus requires cooperation.
- **Clear pathways for industry and investors required:** If cities cooperate among themselves, e.g. in developing a sustainable bus scheme where buses can be ordered in bulk, then this can send clear messages to engage financiers and reduce costs.
- **Regulatory disincentives:** Misalignment between local and national government policy can be a barrier to climate action by cities. For example, in Asia there have been instances where the national policy framework for renewable energy (tax incentives and Feed-in-Tariffs) has been so uncertain that it undermined efforts taken on a local level (Kennedy and Corfee-Morlot, OECD, 2012).
- **Misalignment between planning and implementation:** City departments may be functioning as silos and increased cooperation could form more integrated projects.

Cooperation limiting factor for small projects

Most investors mentioned that 'smaller' projects or cities are often less suitable for investment. These projects and cities require a facility to aggregate small projects into bigger, suitable investment options. This aggregation is especially useful for low-cost carbon reduction measures such as parking permits, cycle master plans, tariffs etc., which rely heavily on the public space and have many different actors involved, as one stakeholder mentions. Another interviewee proposes an independent third party to take the lead in aggregating 'smaller' projects.

3.4 Barrier 4: Lack of track record or credit worthiness

As can be seen in the graph on page 5, eight interviewees (four investors) indicate the lack of a track record or low creditworthiness as a barrier to investment. This aligns with a recent World Bank article, which highlights that "most cities in the developing world don't have access to sufficient, long-term financing and credit".

Only 4% of the 500 largest cities are creditworthy in the international markets and only 20% have a domestic credit rating” (World Bank, 2015). Moreover, lack of a financial track record may also lead to a worse rating, making it even harder for these cities to access finance (World Bank, 2014).

The conclusions of this paper are limited, as all investors interviewed were based in North-America or Europe. They all mentioned that cities in these two continents generally had satisfactory credit ratings for their investments. However, creditworthiness was mentioned in a third of all interviews, so it is clearly a barrier to investments. Two interviewees mention that public finance can help create a credit history ‘as a bridge’ to stimulate private sector finance after a period of time. Two other interviewees mention the World Bank’s Credit Enhancement programme that aims to both improve the regulatory framework of cities to attract finance and “strengthen [their] municipal borrowing performance” (World Bank, 2015).

Early partnerships to overcome credit issues

Earlier partnerships, i.e. engagement of public and private parties in the project planning and feasibility stage can create flexibility that might be needed to overcome credit issues. Early partnerships can allow investors to be involved in project planning and feel greater ownership over the outcome, which builds trust between the city and investor and may help overcome credit issues related to a lack of track record.

4. Ways to overcome barriers

4.1 What are the different finance mechanisms available?

Below we provide an overview of the finance mechanisms available and their advantages and disadvantages by indicating a low, medium or high potential for being used to effectively finance urban mitigation projects (mostly based on Long Finance and WWF, 2015, other sources: Merk et al., 2014, OECD, 2012 and World Bank, 2014). As the overview shows, some mechanisms are more suitable than others to use for urban mitigation projects. The most suitable tools include listed infrastructure equities, green bonds, public-private partnerships and tax incentives. However, all these tools need to be supported by policy for them to stimulate additional investment into urban mitigation projects.

Public	Private Debt	Private Equity
<ul style="list-style-type: none"> • Equity funds (listed and unlisted) low potential due to lack of strategy, depends on scope of fund and reporting. • Equity-funded direct investments in infrastructure: Medium potential. • Special-purpose vehicles, "a subsidiary company with an asset/liability structure that makes its obligations secure even if the parent company goes bankrupt", commonly used for renewable energy projects and depends on government involvement and the type of project. • Joint venture: agreement whereby parties develop a new entity by contributing equity and share revenues and expenses, depends on type of infrastructure. • Infrastructure equities listed: high potential and these own a significant amount of infrastructure assets, "depends on companies' capital expenditure strategy towards low-carbon infrastructure and on policy requirements". • Joint Credit Rating with other national credit rating agencies. • Main advantage: Can leverage private funding • Main Disadvantage: Limited capital available 	<ul style="list-style-type: none"> • Syndicated loans: provided by a group of lenders and administered by one lead arranger (bank). Low potential as difficulty incorporating extensive sustainability lending criteria specified by the providers. • Loans: Concessional and flexible loans have more potential as can specify sustainable objectives. • Bonds: depends on scope and purpose, but can combine with taxes and can make them specific, e.g. infrastructure bonds. • Green bonds: depends on scope, project selection criteria should be specified upfront and monitored. High potential to finance a wide variety of projects, including small ones and accessing the large fixed income investment market which is increasingly interested in low-carbon developments, e.g. asset management firms (World Bank, 2014). • Debt funds: depends on scope of fund and debt refinancing instruments: e.g. securitisation such as forfeiting and subordinate debt financing, suitable for long-term sustainable infrastructure. • Main Advantage: Big scope of financing wide variety projects and accessing large market, including for developing countries where access to capital markets is often restricted • Main Disadvantages: 98% of market is USA/EU, other countries have foreign exchange risks or lower credit ratings. Moreover, often need voter/public approval to issue bonds or loans as city. Lastly, no mature liquid secondary market for sustainable infrastructure exists yet. 	<ul style="list-style-type: none"> • Land sales or infrastructure asset leaseholds: one off source of finance and limited impact, difficulty incentivizing sustainability. • Public-Private Partnerships (PPPs), long-term risk transferred to public sector but attract expertise of private sector. Suitable for capital intensive projects, but even small ones are suitable (OECD, 2014). Could easily include sustainability targets. • Taxes, (tax-increment financing, development charges, value-capture charges) future tax revenues used to attract private finance, real estate developers pay for infrastructure needed to connect their new development to existing infrastructure or value increases of real estate due to new infrastructure development nearby is captured. Requires coordination between city departments and clear goals. • User charges and fees, depends on how externalities are incorporated. • Grants and subsidies: can leverage private finance. • Building rights, planning permits: can easily incorporate sustainability. • Main advantage: Large potential to leverage private finance with these mechanisms and less public approval needed than in debt finance. • Main disadvantages: depends on stable policy environment, hard to replicate as each case is different.

One interviewee also mentioned Energy Performance Contracts (EPCs) as the universal solution for accessing finance for energy efficiency projects. In this scheme, an organization develops a project to deliver energy efficiency and uses the cost savings to repay the costs of the project, which means no extra costs are needed and most building owners would be interested in joining. However, one criticism of this financing mechanism is that it rarely goes beyond standard insulation of buildings to innovative projects or renovation of buildings.

4.2 Ways to overcome barriers and support the use of suitable financial mechanisms

Below are some of the mechanisms proposed by different interviewees to overcome the barriers outlined in section 3:

- **Technical assistance and standardization of reporting** on financial and sustainability information for cities. Interviewees generally believed that if reporting and marketing of projects by cities improved through, for example, technical support by third parties, then this would send a clear signal to financiers who would be more likely to invest in those projects as indicated in previous research by CDP among cities and investors (CDP, 2015).
 - Multi-lateral development banks (MDBs) have so far taken the lead in standardization and improving transparency of reporting (World Bank, 2015). The World Bank initiative already has the support of “55 of the largest investors, bond issuers and intermediaries of green bonds in the world including Bank of America Merrill Lynch, Citibank, Credit Agricole, JP Morgan Chase, Goldman Sachs, HSBC and SEB” (World Bank, 2015).
 - Reporting by cities, mainly in the US, has already improved after the financial crisis.
 - Most investors use third party verification or auditors to ensure that sustainability reporting is reliable. This seems to suggest that investors are willing to bear extra costs associated with sustainability reporting to ensure that these projects meet their standards.
- **More direct communication** between investors and cities can improve understanding of both sides’ needs and add flexibility to the market.
 - Several investors mention they already have more direct contact with issuers of municipal bonds, which leads to a clearer understanding of what is needed and more dynamic partnerships. A direct link between investors and cities would help identify the right financial vehicle needed in specific circumstances and overcome knowledge barriers.
- **Marketing revolution** for projects to provide investors with a method of comparing projects and knowing what is currently in the pipeline. This would also include the aggregation of smaller projects and helping to overcome credit-worthiness problems by incorporating projects within a city-backed green bond, for example (Forster, 2014).

A match-making facility

The interview findings indicated that private sector interest in urban mitigation projects exists, but the main roadblocks are the proper labelling of these projects and the ability for investors to find suitable bankable projects. Therefore, this report suggests that a 'match-making facility' that improves communication, reporting, aggregation and marketing of projects from cities to investors could significantly increase private sector finance of urban mitigation projects. This facility could also be used to connect cities to each other, to allow them to seek joint funding for smaller projects, and also connect public and private investors to facilitate the development of a wide range of projects and finance mechanisms.

4.3 Conclusion

The four main barriers for further investment into urban climate mitigation projects are the political and internal issues faced by cities in developing mitigation projects, knowledge and reporting barriers to develop competitive and bankable projects, the challenge of aligning different actors involved in this space, and the lack of track record or creditworthiness of cities. However, this research has shown that these barriers may be overcome by supporting the use of existing finance mechanisms such as green bonds and public-private partnerships. This can allow cities to tap into a large resource base from private sector investors who have an increased interest in financing 'green' mitigation projects.

The research suggests that the use of existing financial mechanisms can be supported by developing technical capacity in cities, encouraging direct communication between cities and investors, and improving how cities market mitigation projects. However, investors require sufficient reporting to ensure that projects are genuinely green, which may make projects less financially competitive. Early partnerships and flexible and dynamic communication and commitments between parties is therefore essential. A match-making platform that enables cities to develop bankable projects and that allows investors to partner with cities at an early stage of projects could play a significant role in the marketing revolution that urban mitigation projects will need to access this new, substantial stream of finance.

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Appendix A: List of Interviewees

Name	Organisation	Job title
Barbara Whitehorn	City of Asheville	Chief Financial Officer
Sarah Moe and Gil Friend	City of Palo Alto	Finance and Climate Action Plan Implementation and Chief Sustainability Officer
Calvin Wen	Pingtung County (including Pingtung City)	Confidential Assistant to Director of Environmental Protection Bureau
Sean Rooney	City of Canberra	Executive Director Sustainability and Climate Change
Milton Bevington	IMT (Institute for Market Transformation) (City of Boston)	City Advisor for City of Boston
Hronn Hrafnisdottir	City of Reykjavik	Policy and Analysis Department of Environment and Planning
City representative	City of Belo Horizonte	Questionnaire Response
City representative	City of Campinas	Questionnaire Response
City representative	City of Cordoba, Argentina	Questionnaire Response
James Dearborn	Columbia Threadneedle Investments	Senior Portfolio Manager - Head of Municipal Investing
Stephen Liberatore, Sarah Wilson, Joel Levy	TIAA-CREF Asset management	CFA, Managing director and fixed-income portfolio manager
Robert Fernandez	Breckinridge Capital Advisors	CFA, Director of ESG Research
Charles Sandmel	Shelton Capital Management	Portfolio Manager
Lisa Beauvilain	Impax Asset Management	Head of Sustainability & ESG, Director
Manuel Lewin	Zurich Insurance	Head of Responsible Investment
Paul Herman	HIP Investor	CEO and Founder

Alan Synott	Blackrock Inc.	Director, BlackRock Alternative Investors
Talks and report	Meridiam	Talk attended of Thierry Deau, CEO Meridiam
Heather Allen	SloCat (Sustainable Low Carbon Transport Partnership)	COP21-Outreach/Senior Consultant at Paris Process on Mobility and Climate
Adolfo Guerrero	CDIA (Cities Development Initiative for Asia)	Head of China Regional Office and Senior PPP specialist
Chiara von Gunten	GIB Foundation (Global Infrastructure Basel)	Project Manager, Standard for Sustainable and Resilient Infrastructure
Jeffrey Schubb	Coalition for Green Capital (CGC)	Executive Director