



## Resilient Cities 2016 Background Paper

# Finance Opportunities for Climate Change Solutions in Cities

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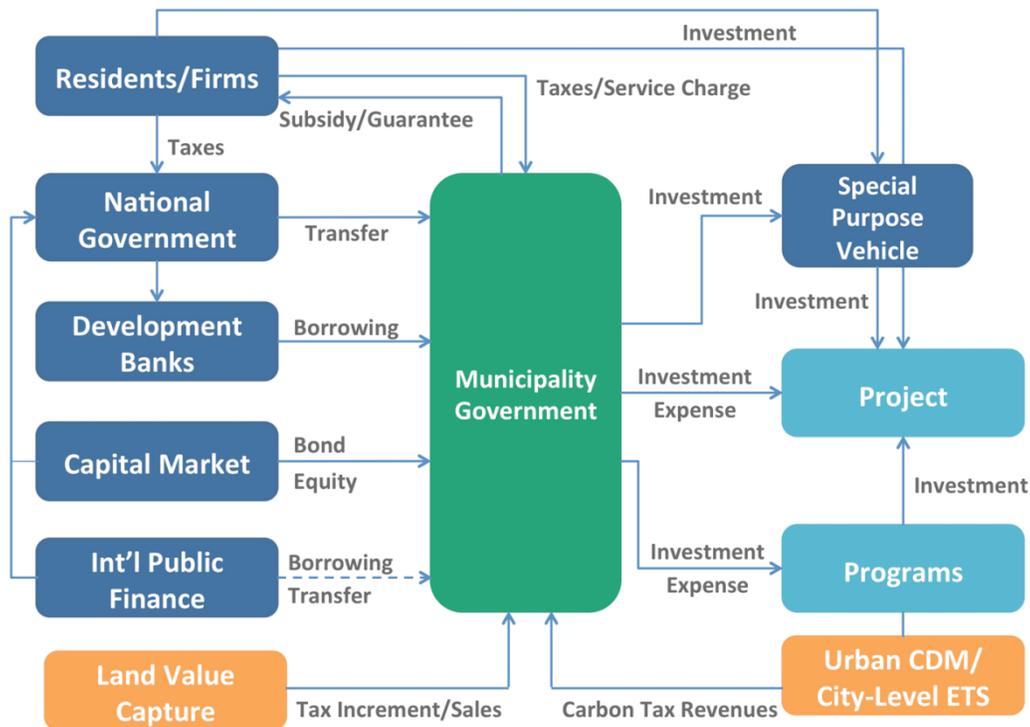
### Abstract

Cities cannot fund climate change responses on public funding sources only. Multiple funding sources are needed to deliver the large infrastructure financing that is essential to low-carbon development and climate risk management in cities. Estimates of annual cost of climate change adaptation range between \$80-100 billion, of which about 80% will be borne in urbanized areas. In an important tracking effort the World Economic Forum estimated an average annual need of almost US\$ 5.7 trillion infrastructure investment to achieve the 2°C stabilization target (WEF 2013), and correspondingly more if the world pursues efforts to limit the temperature increase to 1.5 °C above preindustrial levels as agreed in Paris last year. In the face of these challenges it is clear that public funding mechanisms will be completely inadequate - even with stepped-up contributions to the Green Climate Fund. Cities therefore must tap into a full spectrum of opportunities to raise money for climate action. This background paper shows how municipality governments could raise climate finance from various public and private finance sources and gives best practice examples on how this could be invested in programs and projects. The background paper is taken from the 2nd Assessment Report Climate Change in Cities (ARC3.2) of the Urban Climate Change Research Network (UCCRN) which is set to be released at Habitat III in Quito, Ecuador in October 2016.



**Key findings:**

- Implementing climate change mitigation and adaptation actions in cities can help solve other city-level development challenges, such as major infrastructure deficits.
- Cities cannot fund climate change responses on their own. Multiple funding sources are needed to deliver the large infrastructure financing that is essential to low-carbon development and climate risk management in cities.
- Enhancing credit worthiness and building the financial capacity of cities are essential to tapping the full spectrum of resources and raising funds for climate action.



**Figure 1: Opportunities of climate finance for municipalities**



## 1 Domestic Public Finance

Domestic public finance is a key source of finance for climate change activities at the sub-national level. For municipalities, there are four sources:

- 1) Local taxes and service charges
- 2) Transfers from the federal or state governments,
- 3) Borrowing from domestic financial institutions, and
- 4) Bond and equity finance from domestic capital markets.

### **Local Tax, Service Charges and Transfers from the National Government**

Revenues from local taxes and service charges are a limited but stable source of finance for cities. While most countries collect taxes through national systems, local governments often have the legal authority to collect residual taxes on their own. In practice, there is a tension between national and local taxes and between different localities for imposing lower taxes to attract industrial and commercial investment which limit the municipal revenue that can be achieved. Another relatively limited source of revenue for cities is the collection of service fees. Cities provide public services such as public transport, waste collection/disposal and a drinking water supply. These services generate stable, but price-sensitive sources of municipal revenue that add to local budgets, but are often earmarked for specific use.

Thus, local governments have only limited opportunities to raise discretionary revenues. Typically, they are financially reliant on national governments. For example, while the highly decentralized national government in Indonesia has limited influence over urban policy, it provides a financial incentive through the Specific Allocation Fund (DAK) to encourage urban investment to reduce air pollution, increase adaptation, improve basic services, or otherwise contribute to green growth (Indonesia Ministry of Finance, 2014). In addition to transferring part of their budgets to the local government, in case of the large infrastructure projects (e.g. mass transit systems), the national governments will take responsibility for undertaking urban infrastructure development. Even though the national government can manage larger amount of



public investment than those of municipalities, the national government does not necessarily invest what's needed.

In some instances, despite limited resources, national governments compensate local authorities for the positive environmental spillovers of their spending. Examples include Brazil's tax-based Payment for Ecosystem Services and Sweden's climate investment program (KLIMP) (Revi et al., 2014).

### **National and Regional Development Banks**

Some countries have their own national development banks. In general, they are established as publicly owned entities and national governments will be major shareholders, but they collect funds from the market and/or savings and deposits. National development banks play an important role as agents for governments to provide long-term finance in line with their policies (IDFC, 2014). City governments and municipalities may be able to apply to these domestic public banks for resources under special lines with favorable lender conditions in the field of climate change mitigation and adaptation (KfW, 2013).

One emerging case of a regional development bank is the New York Green Bank that has been established as a public-private partnership. It is a state-sponsored specialized financial entity designed to address gaps in clean energy financing to transform those markets as part of an integrated strategic statewide energy plan ([greenbank.ny.gov](http://greenbank.ny.gov)). Another example is the UK Green Investment Bank, founded in 2012 by the government of U.K. to fund leverage private funds for modern green infrastructure ([UKgov.greeninvestmentbank.com](http://UKgov.greeninvestmentbank.com)).

### **Local Government Bonds**

Depending on the powers granted by the supra-local governments, some cities may be able to issue local government bonds in domestic and/or international markets. The bond issuer can earmark the use of proceeds as well as designate the source of funds for repayment, so the tool can be focused on financing climate change responses. Today, some bonds earmarked for environmental or climate purposes are being called "Green Bonds" or "Climate Bonds". In 2013, the state of Massachusetts initiated this bond form, authorizing the municipal issuance of



US\$ 100 million in green bonds. Gothenburg, Sweden, and Johannesburg, South Africa, followed, issuing green bonds for SEK 500million (US\$79million) and ZAR1.45 billion (US\$136 million) respectively. The Green Bond market is growing rapidly and HSBC estimates that green bond issuance will reach US\$ 40 billion by the end of 2014, rising to US\$ 100 billion in 2015 (Climate Bond Initiative, 2014).

Sub-national entities are often perceived to be high-risk borrowers, which increases their borrowing costs. By obtaining formal (public) credit ratings, creditworthy sub-nationals can increase their lenders' pool, raise cheaper funds, and borrow without sovereign guarantees. Shadow, or confidential, ratings allow sub-nationals to identify the issues that need to be addressed to improve their creditworthiness before obtaining a formal rating. The World Bank Group's PPIAF's Sub-National Technical Assistance (SNTA) program can assist sub-national entities to prepare for and obtain credit ratings. The SNTA program can also provide technical assistance to improve the sub-national's creditworthiness and address weaknesses highlighted by a rating assessment. Although the possibility of bond issuance as well as borrowing from financial institutions depends on the national and local regulations for fiscal management of the municipalities, municipalities should explore this possibility for direct access to finance.

## **2 International Public Finance**

Bilateral and multilateral donors have increasingly focused on providing financing specifically for climate action and corresponding programs and funds have been established that support activities in urban areas.

International public funds dedicated to climate change include:

- Multilateral Development Banks
- Global Environment Facility
- Climate Investment Funds
- Green Climate Fund



- Least Developed Countries Fund
- Special Climate Change Fund
- Millennium Development Goal Achievement Fund
- Adaptation Fund
- Global Facility for Disaster Reduction and Recovery (GFDRR)
- Bilateral sources (national donor funding)

Most international donors and funds channel their resources through national governments of the recipient country (World Bank Group 2011: 81). The Mexico Urban Transport Transformation Program, for example, is co-financed by a \$200 million World Bank loan and by another \$200 million loan from the Clean Technology Fund. While these resources will benefit Mexican municipalities to reduce greenhouse gas emissions in the urban transportation sectors, participating cities access them through the Banco Nacional de Obras rather than receiving them directly from the donor institutions (World Bank Group 2010b: 3). Also multilateral grant finance benefiting cities is usually distributed through or at least in close cooperation with national governments.

There are several reasons for the central role of national governments in the distribution of multilateral funding to sub-national actors. Most importantly, the activities of international donors usually follow agreements negotiated with national governments, for example bilateral contracts or the World Bank's Country Assistance Strategies. Furthermore, internationally-funded projects need to be planned and implemented in a manner consistent with national development plans, which were likely disclosed to funders before monies were awarded. For lending operations and guarantee instruments, the role of national governments is even more important as a sovereign guarantee is usually required for these modalities to be used. If cities want to benefit from multilateral funding, they will therefore usually have to negotiate access with their national government.

Nevertheless, under certain conditions donors can deal directly with city governments. In the case of the Inter-American Development Bank, loans and guarantees can be provided to



municipalities through the bank's private sector facility without requiring a sovereign guarantee. Multilateral sources providing direct access for cities also include the Adaptation Fund and the Millennium Development Goal Achievement Fund (World Bank Group 2011: 83). Nevertheless, consistency with country strategies and the non-objection of the national government still are required. Therefore, even though cities could access multilateral finance directly, these provisions are rarely used. This is unfortunate since the incentive and capacity to leverage external funds may be greater at the local than national level.

The limits and barriers to accessing international donor funding imply that most of the funding needed to tackle the challenges of climate change in cities will have to be mobilized by local governments themselves, in the best case with support from their national government. As such, it is crucial that cities mainstream climate change considerations into their sectoral infrastructure activities. This is especially true as managing climate change can be achieved to a considerable degree by simply closing the current development gap, especially when it comes to building resilience (World Bank Group 2011: 1).

### **3 Private sources of finance**

#### **Private Investment in cities' infrastructure**

In some instances, private finance takes the form of actual ownership of, rather than lending for, needed infrastructure. That is, the private sector may construct or purchase public assets and operate them, freeing up public sector resources for other investments as the private firms manage and deliver public services. Private capital has funded water and sewage systems, transportation systems, telecommunications, and other needed infrastructure for decades (Smith, 1999; Clive, 2003). Privatization has its costs, in terms of some decline in the level of public control over prices and quality of services, but its benefits may include making funds available for public efforts that no private investor would fund itself, such climate adaptation measures for the most vulnerable urban populations with minimal ability to pay for such protection (Satterthwaite, Huq, Pelling, Reid and Romero-Lankao, 2007).



Over the long term, the need for such investments to return profits to their owners will mean that public services or facilities owned by private firms may generate lower public benefits than those owned publically, especially after the debts incurred in their construction are paid for (Clive, 2003; Kessides, 2004). But provision of needed infrastructure through private ownership may be one way for cities to overcome the problems of their limited creditworthiness when pursuing loans, even from favorably-inclined development banks. As climate risks become more severe and the need for adaptation measures more acute, the public benefits to be gained from freeing capital for adaptation investments that would not otherwise be available in urban areas with low credit status may warrant support for private ownership of assets that traditionally have been held in public hands but where the private sector is able and willing to provide the services. On the other hand, such developments may pose problems for public provision, due to concerns over allocation of associated risks (Ng and Loosemore, 2007).

### **Pension Funds**

The by far largest individual investment pools in the world include public and private pension or superannuation funds. Pension fund asset at the end of 2012 in the OECD countries alone totaled over US\$78 trillion (OECD, 2013b). Globally, sovereign wealth funds held by national governments, some of which provide pensions to their citizens with these public assets, amounted to under US\$7.2 trillion in 2014 (SWFI, 2015). With the responsibility of investing to provide funds for retirees, such funds can be characterized as “patient capital.” That is, they do not need to show immediate returns to impatient individual investors, but rather need to have earned returns over a longer horizon, that is, typically decades in the future. At the same time, they have stringent fiduciary responsibilities and must concern themselves with capital preservation. Thus, they can only accept innovative opportunities if their risk of loss is minimized. They may, however, be modernizing their investment criteria (OECD, 1998; OECD, 2008).

To the extent that climate change becomes more acute over time, any investments that successfully respond to those changes, whether providing adaptation and/or mitigation goods and services, will increase in value over time. If the goods and services are sufficiently in



demand today that their provision involves a break-even investment, sector-level losses are unlikely and future profits could be exceptionally high. City climate action programs that can meet this threshold condition, therefore, may be able to access the masses of capital controlled by those pension funds.

#### **4 Market Mechanisms and other innovative finance sources**

##### **Clean Development Mechanism (CDM)**

The CDM is one of the “flexibility mechanisms” defined under the Kyoto Protocol. Its objective is to assist developing countries in achieving sustainable development and mitigating greenhouse gas emissions that cause climate change. In addition, the CDM aims to assist industrialized countries in achieving compliance with their quantified emission limitation. Despite its great success, with more than 7,500 CDM projects registered ([cdm.unfccc.int](http://cdm.unfccc.int)) within many countries and within many sectors, some important emission sources, sectors and countries are still underrepresented within the CDM. A relatively high number of approved methodologies are applicable in the urban context and several successes demonstrate that CDM activities are possible there and should be further developed into SDM activities under the Paris Agreement past 2020.

Urban areas have usually highest population concentrations, which lead to increased demand for the energy resources that cause high levels of greenhouse gas emissions. Implementing sustainability and emission mitigation measures have great potential to be replicated in other cities and countries and may lead to positive cross effects. Although the CDM instrument with its ever-changing and evolving nature has its limitations for wider application in mitigating carbon emission in cities, mitigation measures in cities that are initiated by city councils or municipalities should cover more than one sector/ technology. UNEP and Gwangju City (2012) demonstrate that the CDM has evolved in the right direction by introducing the concept of a Programme of Activities (PoA) that allows for the combination of an unlimited number of emission mitigation activities under a single umbrella using different methodologies. The World Bank’s city-wide



approach proposal follows the basic principles of a CDM PoA that is based on a multi-sector approach (World Bank, 2010). Other innovative approaches include setting aside the funds saved from increased energy efficiency investments for adaptation or further mitigating efficiency efforts (Meyer et al, 2013, Revi et al, 2014), or revolving loan pools that replenish themselves as projects mature and which might be funded through revenue streams from CDM projects (Puppim de Oliveira, 2009).

### **City-level emissions trading systems**

A city-level emission trading system (ETS) is a mitigation approach to encourage municipalities and private sectors to foster low-carbon project financing. The Governor of Tokyo, Shintaro Ishihara, submitted a bill to the Tokyo Metropolitan Assembly in June 2008 that introduced mandatory targets for reductions in overall greenhouse gas emissions for large-scale emitters as part of an emissions trading program. The Tokyo Metropolitan Assembly passed the bill, thus introducing Japan's first cap-and-trade emissions trading program, which took effect in fiscal 2010. Since then, the Tokyo Metropolitan Government (TMG) developed a cap-and-trade program that many advanced nations and regions are also moving to implement. TMG's program is the first one to be implemented in Japan and Asia. (Tokyo Metropolitan Government, 2010; for more details see the Case Study Docking Station of ARC 3.2).

### **Land Value Capture**

Cities usually own substantial assets that could be managed to facilitate climate change mitigation and adaptation. One approach, already frequently used for financing transportation systems, is land value capture. Land value capture, like local taxes, user charges, and licenses, are local public sources of finance. As Smith and Gihring (2006) describe, transit infrastructure can be at least partly funded by capturing the increase in the land value of properties close to transit stations." For example, in Hong Kong, the government's "Rail plus Property" model captures the uplift in property values along new transit routes, ensuring efficient urban form while delivering US\$940 million in profits in 2009 for the 76% government-owned MTR Corporation (Rode et al. 2013). Sao Paulo has raised over US\$1.2 billion in six years using



related instruments, and Curitiba is funding the conversion of a highway into a BRT corridor, complemented by higher-density, mixed-use spaces and green areas – an investment of US\$600 million (Soffiatti 2012, Merk et al. 2012). There are different variations of land value capture: development impact fees, tax incremental financing, public land leasing and development right sales, land readjustment programs, connection fees, joint developments, and cost/benefit-sharing (NCE 2014).

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