

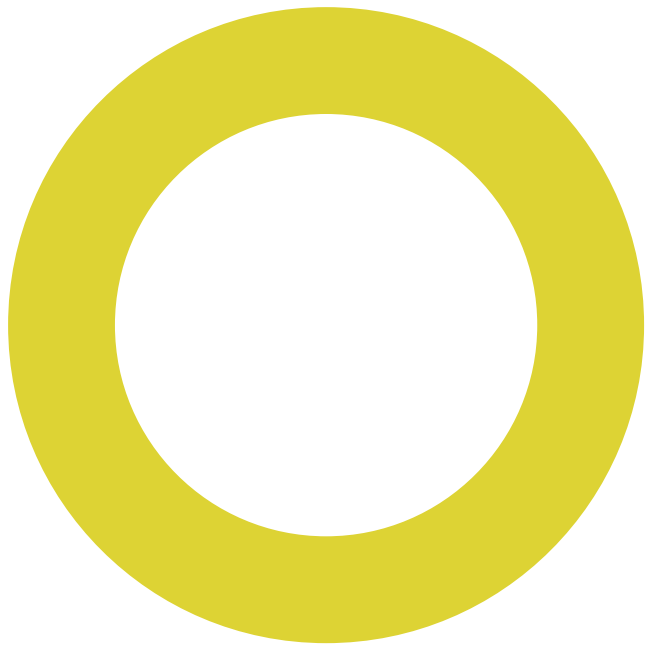
# **cities fit for climate change**

**Challenges and Opportunities for Urban Climate Finance –  
Lessons Learned from eThekweni, Santiago de Chile and Chennai**

Published by

**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH





**cities fit for  
climate change**

**Challenges and Opportunities for Urban Climate Finance –  
Lessons Learned from eThekweni, Santiago de Chile and Chennai**



As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

The project "Cities Fit for Climate Change" is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) supports this initiative on the basis of a decision adopted by the German Bundestag. Responsible division within the BMUB: SW I 1, Urban Development Policy, Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), Dr Oliver Weigel.

**Published by:**  
Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

**Registered offices**  
Bonn and Eschborn, Germany

Project: "Cities Fit for Climate Change"

Section Governance and Human Rights  
Friedrich-Ebert-Allee 36 + 40  
53113 Bonn, Germany  
T +49 228 4460-37 62  
F +49 228 4460-17 66  
E [info@giz.de](mailto:info@giz.de)  
I [www.giz.de](http://www.giz.de)

**Responsible:**  
Dr Daphne Frank  
Head of Project Cities Fit for Climate Change  
T +49 228 44 60- 33 62  
E [daphne.frank@giz.de](mailto:daphne.frank@giz.de)

**Cities Fit for Climate Change team:**  
Philipp Kühl, Amina Schild, Lea Kulick, Karen Pacheco,  
Andrea Palma, Sudakhar Krishnan, Zane Abdul

**Commissioned Authors:**  
Dennis Tänzler, Annica Cochu, Rainer Agster, adelphi  
Alt-Moabit 91  
10559 Berlin

**With support from:**  
Belynda Petrie, One World, South Africa  
Cristóbal Reveco, Adapt Chile, Chile  
Bedoshruti Sadukhan, ICLEI, India

**Design and layout:**  
EYES-OPEN, Berlin

**Photo credits:**  
Cover: © Dorigo Wu

**URL links:**  
This publication contains links to external websites.  
Responsibility for the content of the listed external sites always lies with their respective publishers.

GIZ is responsible for the content of this publication.

**As at:**  
Bonn, Germany, November 2017



# Preface

Dear readers,

In our common struggle for a sustainable future, we need to turn to the places that accommodate most humans, namely cities. Urban spaces are both powerful and vulnerable actors in the struggle against climate change. While producing over 75 per cent of global CO<sub>2</sub> emissions, a large share of the world's cities will be affected by dangerous climatic events such as floods, storms and periods of extreme heat or cold. At this critical crossroad, local authorities must be supported in minimising the causes of climate change and sufficiently protecting themselves from its impacts.

This means that cities in the future will look different from today. Existing urban development instruments and strategies such as urban development plans, land-use plans and zoning plans need to become climate-proof. The question of funding is particularly important as the large amounts of financing needed for modernising and building infrastructure cannot sufficiently be provided through domestic revenues. Unfortunately, cities still face multiple obstacles in obtaining funding for climate related investments. Appropriate legal frameworks and financial management capacities are required to access international donor funds and private capital markets are often missing.

The GIZ-project "Cities Fit for Climate Change" (CFCC), funded by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), aims to develop integrated instruments that enable a new type of climate-proof urban development. In this way, the project supports innovative solutions for urban planning and makes cities 'fit for climate change'. The partner cities Santiago de Chile, eThekweni (Durban) in South Africa and Chennai in India are supported towards further developing their strategies and financing opportunities in a climate-friendly manner. The experiences are presented at international events and thus support, among other things, the UNFCCC and Habitat III process of implementing the New Urban Agenda. The project aligns

itself with the Leipzig Charter on Sustainable European Cities and the Memorandum on Urban Energies.



To assist our partner cities in identifying available financing options and gaining access to them, the CFCC project commissioned adelphi consult to conduct this study. The objective was to produce a comprehensive assessment of the situation of urban climate finance in the three partner countries with a specific focus on CFCC's partner cities. This includes recommendations for improving municipal/city access to funding instruments for climate change related work and for better integrating climate change into planning mechanisms. One of the key takeaways from this study is that finance and governance are very closely intertwined. Without sound municipal financial management systems and enabling governance frameworks (on local and national level) all efforts to increase funding for climate action will have limited impact.

I would like to thank the adelphi team for the dedication and effort they have put into this comprehensive analysis. Gratitude is extended to all stakeholders who contributed to the study, such as the project partners in South Africa, Chile and India, all the other interviewees and the local contractors conducting the interviews. Moreover, I would like to thank the BMUB and in particular its urban development division (SW I 1) headed by Dr Oliver Weigel for their continuous support.

With this study, I hope to give you better insights into the important topic of urban climate finance and wish you an interesting read.

**Dr Daphne Frank**

*Head of the Cities Fit for Climate Change project*



# Content

<b>1. Background . . . . .</b>	<b>17</b>
<b>2. Status Quo of urban climate finance . . . . .</b>	<b>19</b>
2.1 Urban change and corresponding financial needs . . . . .	19
2.2 Defining urban climate finance . . . . .	21
2.3 Sources of funding for urban climate projects . . . . .	24
2.4 Measuring urban climate finance . . . . .	33
<b>3. Trends, challenges and opportunities . . . . .</b>	<b>36</b>
3.1 Trends in international urban climate finance . . . . .	36
3.2 Challenges for urban climate finance. . . . .	37
3.3 Opportunities and good practice examples . . . . .	42
<b>4. Case study methodology . . . . .</b>	<b>54</b>
<b>5. eThekweni (South Africa) . . . . .</b>	<b>55</b>
5.1 Background: cities and climate change in South Africa . . . . .	55
5.2 Municipal finance framework . . . . .	57
5.3 Framework for urban climate action . . . . .	60
5.4 Landscape of urban climate finance in eThekweni . . . . .	62
5.5 Challenges for urban climate finance. . . . .	65
5.6 Opportunities for urban climate finance. . . . .	70
5.7 Conclusions and recommendations for eThekweni . . . . .	74
<b>6. Santiago (Chile). . . . .</b>	<b>77</b>
6.1 Background: cities and climate change in Chile . . . . .	77
6.2 Municipal finance framework . . . . .	79
6.3 Framework for urban climate action . . . . .	81
6.4 Landscape of urban climate finance in Santiago de Chile . . . . .	84
6.5 Challenges for urban climate finance. . . . .	86
6.6 Opportunities for urban climate finance. . . . .	89
6.7 Conclusions and recommendations for Santiago de Chile . . . . .	95



<b>7. Chennai (India)</b> . . . . .	<b>97</b>
7.1 Background: cities and climate change in India . . . . .	97
7.2 Municipal finance framework . . . . .	99
7.3 Framework for urban climate action . . . . .	101
7.4 Landscape of urban climate finance in Chennai . . . . .	104
7.5 Challenges for urban climate finance. . . . .	107
7.6 Opportunities for urban climate finance . . . . .	110
7.7 Conclusions and recommendations for Chennai . . . . .	114
<b>8. Conclusions and recommendations</b> . . . . .	<b>117</b>
8.1 Lack of awareness, political priority and capacity: Linking climate change to the quality of life in cities . . . . .	117
8.2 Weak institutional structures for low-carbon, resilient development: Fostering cooperation . . . . .	118
8.3 Lack of processes and tools for climate finance: Investing in strategic planning for climate change . . . . .	119
8.4 (Possibly) Inadequate use of available funding: Strengthen monitoring, reporting and verification . . . . .	120
8.5 Low relevance of international finance: Making good use of domestic public finance . . . . .	121
8.6 Limited access to international climate finance: Increasing knowledge at the local level . . . . .	122
8.7 Lack of private engagement and finance: Creating attractive projects and other incentives . . . . .	123
<b>9. Bibliography</b> . . . . .	<b>124</b>
<b>10. Annex I: Multi- and bilateral funds</b> . . . . .	<b>131</b>
10.1 International climate funds . . . . .	131
10.2 Multi- and bilateral development banks. . . . .	136
10.3 Other multi- and bilateral public finance . . . . .	140
<b>11. Annex II: Requirements for GCF accreditation</b> . . . . .	<b>141</b>
<b>12. Annex III: Initiatives supporting climate-smart urban development and finance</b> . . . . .	<b>143</b>
<b>13. Annex IV: Interview guide and lists</b> . . . . .	<b>145</b>
13.1 Interview guide . . . . .	145
13.2 Interview list eThekweni. . . . .	146
13.3 Interview list Santiago. . . . .	147
13.4 Interview list Chennai. . . . .	148



# List of tables

<b>Table 1:</b> Multi- and bilateral funding sources for urban climate projects . . . . .	28
<b>Table 2:</b> Investment criteria of the GCF and AF . . . . .	30
<b>Table 3:</b> Funding for different stages of infrastructure development . . . . .	33
<b>Table 4:</b> Global climate finance by source in 2014. . . . .	35
<b>Table 5:</b> Processes, structures and capacities for urban (climate) finance . . . . .	39
<b>Table 6:</b> Standards and principles of the GCF . . . . .	141

# List of figures

<b>Figure 1:</b> Urban and rural population of the world, 1950–2050 . . . . .	19
<b>Figure 2:</b> Sources of funding for urban climate-aligned development . . . . .	24
<b>Figure 3:</b> Access to the GCF . . . . .	28
<b>Figure 4:</b> Urban climate finance from funds, by focus and fund, 2010–2014 . . . . .	29
<b>Figure 5:</b> Urban climate finance from development banks, by sector, 2014 . . . . .	30
<b>Figure 6:</b> Share of climate finance directed to urban projects (in US\$ millions, 2014) . . . . .	35
<b>Figure 7:</b> Opportunities for reducing urban climate finance challenges . . . . .	42
<b>Figure 8:</b> eThekweni, South Africa. . . . .	55
<b>Figure 9:</b> Revenue sources of “metros” (in %) . . . . .	58
<b>Figure 10:</b> Spending of operating budget and capital budget, eThekweni, 2012–2015 . . . . .	60
<b>Figure 11:</b> The Green Fund (Hemraj 2014) . . . . .	64
<b>Figure 12:</b> Santiago, Chile (left); Metropolitan Region of Santiago (right) . . . . .	78
<b>Figure 13:</b> Chennai, India . . . . .	97
<b>Figure 14:</b> Climate change relevant authorities in Tamil Nadu and Chennai . . . . .	101





# List of abbreviations

<b>AAAA</b>	Addis Ababa Action Agenda	<b>DEA</b>	Department of Environmental Affairs
<b>ADB</b>	Asian Development Bank	<b>DFI</b>	Development Finance Institution
<b>AF</b>	Adaptation Fund	<b>EIB</b>	European Investment Bank
<b>AfDB</b>	African Development Bank	<b>EE</b>	Energy efficiency
<b>AFD</b>	<i>Agence Française de Développement</i> (French Development Agency)	<b>EO</b>	Energy office (Durban)
<b>CAF</b>	<i>Corporacion Andina de Fomento</i> (Development Bank of Latin America)	<b>EPCPD</b>	Environmental Planning and Climate Protection Department (Durban)
<b>Capex</b>	Capital expenditure	<b>FINDETER</b>	<i>Financiera de Desarrollo Territorial</i> (Financial Corporation for the Territorial Development)
<b>CAS</b>	<i>Clima Adaptación Santiago</i> (Climate Adaptation Santiago)	<b>FFD</b>	Financing for Development
<b>CCFLA</b>	Cities Climate Finance Leadership Alliance	<b>FNDR</b>	<i>Fondo Nacional de Desarrollo Regional</i> (National Fund for Regional Development)
<b>CCR</b>	Climate change response	<b>GCF</b>	Green Climate Fund
<b>CDM</b>	Clean Development Mechanism	<b>GEF</b>	Global Environment Facility
<b>CMA</b>	Chennai Metropolitan Area	<b>IDB</b>	Inter-American Development Bank
<b>CMCDM</b>	Chennai Mega City Development Mission	<b>IDFC</b>	Infrastructure Development Finance Company
<b>CMDA</b>	Chennai Metropolitan Development Authority	<b>IDP</b>	Integrated Development Plan
<b>CMWSSB</b>	Chennai Metro Water Supply and Sewerage Board	<b>IFC</b>	International Finance Cooperation
<b>CFR</b>	Climate finance readiness	<b>IFI</b>	International Finance Institution
<b>CORECC</b>	<i>Comité Regional de Cambio Climático</i> (Regional Climate Change Committee)	<b>IPP</b>	Independent power producers
<b>CORFO</b>	<i>Corporación de Fomento de la Producción</i> (Corporation for the Promotion of Production)	<b>IRP</b>	Integrated Resource Plan
<b>CTF</b>	Clean Technology Fund	<b>JNNURM</b>	Jawaharlal Nehru Urban Renewal Mission
<b>DBSA</b>	Development Bank of Southern Africa	<b>LDCF</b>	Least Developed Countries Fund
<b>DCCS</b>	Durban Climate Change Strategy	<b>MDB</b>	Multilateral development bank
		<b>M&amp;E</b>	Monitoring and Evaluation
		<b>MFMA</b>	Municipal Finance Management Act



<b>MINVU</b>	<i>Ministerio de Vivienda y Urbanismo</i> (Ministry of Housing and Urban Development)	<b>SCCF</b>	Special Climate Change Fund
<b>MRS</b>	Metropolitan Region of Santiago	<b>SDGs</b>	Sustainable Development Goals
<b>MRV</b>	Monitoring, reporting and verifying	<b>SEREMI</b>	<i>Secretaría Regional Ministerial</i> (Regional Ministerial Secretaries)
<b>NAMA</b>	Nationally Appropriate Mitigation Action	<b>SFC</b>	State Finance Commission
<b>NAPCC</b>	National Action Plan on Climate Change	<b>SFI</b>	Specialised Financial Institutions
<b>NABARD</b>	National Bank for Agriculture and Rural Development	<b>SPV</b>	Special Purpose Vehicle
<b>NDC</b>	Nationally Determined Contribution	<b>SUBDERE</b>	<i>Subsecretaría de Desarrollo Regional</i> (Undersecretariat of Regional and Administrative Development)
<b>NIE</b>	National Implementing Entity	<b>UCCRTF</b>	Urban Climate Change Resilience Trust Fund
<b>NUA</b>	New Urban Agenda	<b>UCF</b>	Urban climate finance
<b>Opex</b>	Operating expenditure	<b>UFPP</b>	Urban Financing Partnership Facility
<b>PPCR</b>	Pilot Program for Climate Resilience	<b>ULB</b>	Urban local bodies
<b>PPP</b>	Public-private-Partnership	<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>RE</b>	Renewable energy	<b>UO</b>	Urban Operations
<b>REGO</b>	Regional Government		
<b>SANBI</b>	South African National Biodiversity Institute		



# Executive summary

Global mitigation and adaptation efforts have to be geared up in order to reach the climate goal stipulated in the Paris Agreement and to limit the negative impacts of climate change on human and natural systems. Cities and metropolitan areas have large – and still growing – potential for mitigation and adaptation. On the one hand, cities account for a lion's share of greenhouse gas emissions. This is mainly due to the concentration of economic activities in urban areas. On the other hand, large agglomerations of people and infrastructure are highly vulnerable to the potential impacts of climate change – a situation that is further exacerbated by urbanisation.

Lack or inaccessibility of funding is widely perceived as a major bottleneck for concerted climate action, especially in cities. While a large infrastructure financing gap is already apparent today, the need for significant financial resources to take proactive climate action will, at least in the short run, further widen the gap. This aspect is also crucial when exploring the potential of cities to make a major contribution to global decarbonisation processes in the aftermath of the Paris Conference in December 2015. This study looks at the status quo, challenges and opportunities for urban climate finance<sup>1</sup> in general and provides detailed overviews of urban climate finance in three case study cities (eThekweni, South Africa; Santiago, Chile; and Chennai, India).

The study was written on behalf of the GIZ global project "Cities Fit for Climate Change". The project cooperates with various partners internationally and in

Germany. The objective of the project is to support the three partner cities – Chennai, eThekweni and Santiago – in developing instruments for integrated, resilient and low-carbon sustainable urban development, climate-proofing their strategies and improving their financing possibilities. The experiences will be shared at international meetings and conferences. The present study is meant to contribute to these objectives and can also serve as inspiration and guidance for similar cities across the globe.

## Status quo of urban climate finance

Cities or metropolitan areas can theoretically tap a wide variety of sources to cover the costs of climate projects. Commonly, several funding sources have to be combined in order to cover for the expenses of urban projects from their planning to implementation and maintenance.

- Climate projects are often funded from the budget of the department in charge, with support of grants or loans from higher level governments or domestic specialised financial institutions (national development banks, municipal funds, etc.).
- Multi- and bilateral finance provided by (climate) funds, such as the Green Climate Fund and Adaptation Fund, and by development banks play an increasing role for urban climate finance. However, the vast majority of international climate finance cannot be directly accessed by local governments as accreditation is usually reserved for higher-level authorities. Cities thus have to coordinate funding proposals with implementing entities and national designated authorities.
- Private capital and investments are considered key financial instruments of future (urban) climate projects. Options range from municipal borrowing and bonds to public-private partnership and direct private investment in projects with attractive risk-return profiles. Yet, many of these private financing

<sup>1</sup> A universal definition of (urban) climate finance does not exist. Particularly at the local level, climate finance might not be a particular concept as many aspects of climate change adaptation (and, to some extent, mitigation) are blended in with other development objectives. Given the lack of an agreed definition of urban climate finance, this study considers it to be funding for projects with co-benefits for climate change mitigation and/or adaptation in cities. Such financing can come from public or private sources and can be sourced internationally, regionally, nationally or locally. The lack of a clear definition of climate (urban) finance makes it hard to track and monitor funding for projects with positive (side) effects for mitigation or adaptation.

opportunities are limited to projects with clear revenue streams that can be used to repay the debt. Private involvement in climate-smart cities currently remains limited.

Most of these sources are not limited to climate projects and, in fact, “regular” development finance also proves to be an important source of funding for mitigation and adaptation as long as such objectives are integrated with other urban development goals (energy and water security, reduction of air pollution, safe housing for the urban poor, extensive and well-functioning public transport, etc.).

### Challenges and opportunities for urban climate finance

Several factors deserve examination as main barriers for climate finance readiness, as they make it difficult for cities to climate-proof urban services and infrastructures; establish sound financial management; and to deal with the specific features of urban climate finance (e.g. tracking of climate finance and its impacts). The challenges can be divided into internal and external ones:

- Internally, i.e. within municipal administration itself, such barriers include lack of awareness, political priority, capacity, institutional structures and tools.
- Externally, i.e. outside of municipalities’ direct sphere of influence, challenges include detrimental national regulation, unattractive risk-return profiles of climate projects, political and economic risks as well as lack or inadequacy of financial mechanisms.

An initial review on the literature on urban climate finance helps to identify a set of opportunities for easing these challenges:

- Above all, capacity building is the basic foundation for making sure that local governments and other stakeholders understand the challenges and opportunities of urban climate finance.
- Moreover, it is necessary that municipalities create the basic institutional structures and strategies for improving climate planning and financial management.

- Where municipal revenues are insufficient, cities can attract additional revenues and investment capital through “new” financing instruments, such as land value capture and bonds.
- Financial intermediation through specialised financial institutions, in turn, can serve to pool risks and channel international funds directly to sustainable urban development.
- Finally, it is necessary to create enabling framework conditions for local governments to proactively engage in climate projects and obtain the required funding.

These challenges and opportunities were used to structure the case studies. While some aspects fit all three cases very well, others seem to be less relevant. In the following, key learnings from each city are described and final conclusions are drawn.

### Urban climate finance in eThekweni

In eThekweni, key departments have successfully initiated adaptation and, more recently, mitigation projects. A climate change strategy was developed in 2014 and is currently being operationalised. Yet, departments which could further catalyse eThekweni’s climate response, such as planning, transport and electricity, lack tools and capacities to mainstream climate change into their projects. Knowledge transfer between departments is hampered by the lack of municipal cooperation on climate change-related matters. Moreover, existing regulation stipulates short-term (financial) planning, thus discouraging consideration of the long-term benefits of climate-smart investments.

eThekweni’s climate projects are funded mainly from the involved departments’ budgets or from multi- and bilateral funds. The private sector has so far played a limited role in urban climate finance. Several factors make it necessary to strengthen climate finance for eThekweni in the future. Firstly, the traditional municipal revenue model, which heavily depends on electricity and water sales and other services charges, has become challenged by increasing private renewable energy generation and growing water scarcity. High-level political decisions (e.g. regarding renewable energy targets) and the speed of regulatory reform (e.g. of South Africa’s Municipal Finance Management Act



(MFMA)) will affect the degree to which municipalities can react to such shifts. Secondly, intergovernmental transfers do not reflect climate risks and thus fail to stimulate and support local climate action. A strategy for accessing climate finance does not exist, resulting in projects following available finance. Knowledge of international sources of climate finance and of their requirements is relatively low.

The recommendations for support to eThekweni in strengthening urban climate finance fall into three categories and in many ways cross cut other spheres of government and governance in South Africa:

**Strengthen climate governance and institutional frameworks:** An informal technical cross-sectoral climate working group (CWG) should be created to discuss new projects or developments with a view to climate change. The participation of eThekweni in provincial and national climate governance needs to be strengthened, e.g. through cooperation with the Department of Environmental Affairs on tracking and impact monitoring of climate projects. Partnerships also need to be established with universities to support the CGW and operationalisation of the climate change strategy and with civil society organisations to mitigate community conflicts or objections.

**Climate capacity development:** Capacity building is required to enable mainstreaming of climate change into development plans, hence driving climate-aligned budget allocations. Not only urban planning but also other key departments, such as engineering, finance, transport, etc., need to strengthen their climate capacities. eThekweni could also learn from other climate projects, such as Adaptation Fund (AF) projects implemented in other South African communities. This could be achieved by strengthening the relationship with the South African National Biodiversity Institute as the accredited national implementing entity (NIE) to the AF in South Africa. A proposal for the Green Climate Fund is already under way.

**Mainstreaming climate into revenue and expenditure models:** Intergovernmental transfers and grants should be adapted to specifically consider climate change among their criteria; additional government transfer instruments might be necessary. At the same time, eThekweni needs to track shifts, e.g. regarding electricity and water sales and related regulation, so as to inform

future revenue modelling and budgeting processes. However, revenue models are framed by the regulatory framework, such as the MFMA, and reform is likely to be very slow. Transformational change in revenue models can be fostered, for instance, by piloting and establishing long-term planning.

In conclusion, eThekweni is considered an excellent city case to test, learn and scale up climate driven mainstreaming, capacity development and transformation. Lessons will be useful for other urban centres in South Africa, regionally and globally.

## Urban climate finance in Santiago

The Metropolitan Region of Santiago (MRS, Spanish: *Región Metropolitana de Santiago*) is made up of 52 communes, each with its own mayor and administration (municipality). The region itself is governed by the Regional Government (REGO, Spanish: *Gobierno Regional*) which has, however, very limited power over the communes. National ministries are also involved at the local level. Important basic urban services, such as electricity and water supply, are fully privatised. Cooperation between the municipalities, the regional government and national ministries as well as between public and private stakeholders is limited, which is complicating concerted climate action and application for climate finance.

Awareness of the long-term costs of climate change and capacity for climate mainstreaming are low in Santiago. Projects with benefits for the climate and urban resilience are often initiated and funded by national ministries. As municipalities in Chile are not allowed to take debt, they depend on their own revenues and transfers or on lending from the national and regional governments. International climate finance, in turn, is perceived to be “reserved” for Chile’s forestry sector and for private renewable energy projects outside of urban areas. Due to these reasons specific climate funding is not being requested in Santiago. Experts suggest that if climate change becomes a priority and capacities get strengthened, funding for climate-compatible development can be made available from existing funds.

However, important politic-administrative changes are taking place that are going to affect the approach to climate change, making it hard to predict what will be the specific institutional needs and how this is going to

change available budgets. With reforms under way that will give more power to the regions and plans to establish a regional climate change committee (*Comité Regional de Cambio Climático*, CORECC) in the MRS, the climate mandate is expected to become clearer in Santiago. On the national level, responsibility for climate action has recently been transferred to a new agency which can potentially serve as the focal point for experimenting with new approaches to urban climate management and finance.

The recommendations for increasing access to urban climate finance in Santiago focus on supporting such change and building processes for climate-aligned development.

#### **Strengthen climate change institutions and strategies:**

The national government, development cooperation agencies and NGOs should provide support to the REGO and to the Regional Ministerial Secretary of Environment in constituting the MRS CORECC. The CORECC, once established, needs to compile and systematise information on climate change and related projects and funding, as such data is currently dispersed in various institutions. Then, an Adaptation and Mitigation Plan for the City of Santiago should be generated that goes beyond the four years of administrative terms. For the implementation and mainstreaming of this plan into all sectors and municipalities, the CORECC will have to foster coordination and cooperation. On the national level, it will be necessary to evaluate which agency is responsible for leveraging climate finance, since there is no Development Bank in Chile.

**Climate capacity development:** Capacity building can enable authorities to discuss climate change-related matters among each other and with (inter)national organisations. Both, the basics of climate change and the specific opportunities for accessing climate finance are important topics that need to be anchored within the CORECC and, as much as possible, within the communes. The Chilean Network of Municipalities for Climate Change can play an important role in fostering municipal action.

#### **Leverage the (financial) strengths of stakeholders:**

With all urban services fully privatised, efforts to promote mitigation or adaptation have to involve the private sector (e.g. for water security, waste management, clean

energy). Municipalities thus need to create incentives for Santiago's private companies to account for climate change and to adapt their investments. Climate measures with sound underlying business models need to be identified and communicated. Strengthening the role of local NGOs in Santiago, e.g. in regard to the development of the city's climate change plans, might also be helpful due to their capacity and technical expertise, and their disinterested vocation. Finally, the community itself should be considered as a generator of resilience. This requires incentives for households and local private companies to become active themselves.

## **Urban climate finance in Chennai**

The Greater Chennai Corporation, responsible for governing the city of Chennai, does not have a climate change cell and climate-relevant responsibilities are dispersed between municipal departments. Key urban services, such as planning, water management and public transport, are performed by state departments or parastatal agencies. A lack of coordination among the different authorities impedes concerted, city-wide action on climate change. What is more, political leadership in Chennai is largely unaware of the complex impacts that climate change may have on urban development. As a result, projects are based more on political interests than on resilience needs. Municipal staff (mainly engineers) lacks the capacity to integrate climate change in developmental programmes, identify climate financing sources and access and efficiently use available national and international funding.

Despite the lack of guidance and budget for climate action in Chennai, the city has a number of projects with positive side effects for climate protection (e.g. reduction of electricity losses) and resilience (water management, storm water drainage). These projects are mainly financed through national and international development projects that help improve basic urban services, without particular focus on climate change (e.g. the Government of India's Smart Cities Mission). Given such financial support and relatively stable municipal revenues, urban development is perceived to be rather well funded in Chennai. Yet, Chennai Corporation had to significantly increase borrowing in order to pay for the extension of urban services to the city's peri-urban areas (under jurisdiction of the Corporation since 2011). The real need for climate





finance in Chennai is unknown, as there is no tracking mechanism institutionalised at the city level. These factors make it difficult to predict whether traditional finance is sufficient to pay for growing adaptation and mitigation requirements in Chennai.

**Strengthen climate change institutions and strategies:**

The Chennai Corporation should assess the option of creating a dedicated Climate Change Cell. This could be an extension of the Control Room that presently brings together different departments to work on a common topic. Subsequently, a climate change strategy needs to be developed for the city that identifies vulnerabilities and prioritises appropriate interventions. At the same time, it would be beneficial to make sure that the new city plans (currently under revision) also reflect climate factors. The National and State Government must also promote the cooperation of parastatal organisations in Chennai with the Municipal Corporation. This will enable the Chennai Corporation to integrate their project activities with the broader programmes of the state government that are implemented through the parastatal organisations.

**Climate capacity development:** Chennai Corporation and the other agencies involved in Chennai need to build staff capacity on climate change (basic concepts, impact and risk assessments, effective mitigation and adaptation measures, climate co-benefits of development projects, effect of increased energy and resource efficiency on operating costs, etc.) and climate financing (available funding avenues, application requirements). Bilateral organisations can play an important role in providing training and capacity building for municipal staff. At the same time, companies need to be sensitised regarding the risks of climate change on profits. Building this understanding will help the industries to come together, connect and build funds for climate change projects.

**Improving climate finance at the level of the National and State governments:** Mainstreaming climate into development finance would allow using the available funding more effectively. If climate change can be integrated with central government schemes like the Smart Cities Mission, Housing for All, Swach Bharat Mission (national waste management programme) and others, it would enable cities to allocate finance to climate specific action through these funding sources. At the same time, Union and State Governments should

assign dedicated climate finance to encourage cities to take climate action.

## Conclusions on the prospects of urban climate finance

From the case studies, overall challenges and recommendations can be deduced.

**Lack of awareness, political priority and capacity – Linking climate change to the quality of life in cities:**

The case studies show that lack of awareness and political priority for climate change prevent cities from taking action. People tend to underestimate the costs of inaction versus potential co-benefits of climate smart development because they are very long term and difficult to measure or quantify. This challenge is even more prominent for adaptation than for mitigation because adaptation is broader and more complex and its benefits are harder to measure. Illustrating how climate change action is interrelated with urban development and delivery of urban services will serve as an impetus for gearing up climate protection and resilience building, across the government, private sector and civil society. Capacity issues are also prevalent, ranging from the basics of climate change and assessing its localised impacts to developing project proposals that match the requirements of donors and financiers. Such capacity issues require major attention to ensure that urban climate finance can realise its full potential – especially with respect to improved access to international funding. Yet, capacity restrictions can also be caused by general understaffing of departments or high turnover of staff. Even if municipal officials have the required skills to manage all aspects of climate finance, they often lack the time or incentive to do so.

## Recommendations

- **Municipal governments:** Assess and widely communicate long-term socio-economic impacts of climate change. This will create buy-in of citizens and governmental departments, increase demand for climate-smart urban services and infrastructures and help justify the costs of climate action. Such analyses should be conducted with support from academia.

- **Municipal governments:** Invest into capacity building, starting off with climate risk assessments and then moving on to more climate-finance specific topics, such as climate-sensitive cost-benefit analysis for project prioritisation and/or investment criteria of the available funding sources.
- **Development cooperation community and NGOs:** Support capacity building, especially of urban climate champions, across all departments. While departments that are already involved in climate action need capacity building on the different forms of and access modes to climate finance, other departments most likely require help in identifying the impacts of climate change on their services or industry branch and reflecting these in adequate project proposals.

**Weak institutional structures for low-carbon, resilient development – Fostering cooperation:** Mainstreaming was perceived to be of extreme importance in all case studies as it allows using available funding more effectively. Yet, the lack of cooperation between municipal departments and between municipalities and state/regional or national government bodies effectively impedes mainstreaming of climate change into all sectors and aligning (climate) frameworks to promote local action. Horizontal cooperation can be fostered by establishing climate change platforms or dedicated climate change cells. These bodies can coordinate a coherent overall approach to climate and improve climate finance readiness, e.g. through strengthening climate-relevant planning capacities. Vertical cooperation should be sought on topics that are relevant for higher-level governments and that municipal authorities cannot easily manage themselves (e.g. monitoring of urban contributions to national climate goals, integrating urban priorities into climate finance strategies, etc.).

## Recommendations

- **Municipal governments:** Foster cooperation between departments in order to make sure that climate factors are considered in the development and financial planning of new projects. Such cooperation can start off informally and later on become formalised through climate change working groups or dedicated climate cells.

- **Higher-level governments:** Increase cooperation with local governments and municipal networks to make sure that climate (finance) strategies and frameworks are aligned. Such cooperation can go beyond information exchange and take the form of action partnerships, e.g. for testing national monitoring and evaluation frameworks on the local level. Moreover, national governments should make sure to be informed about urban contributions to national climate targets.
- **Development cooperation community and NGOs:** Provide technical assistance for the establishment of climate change working groups (or dedicated climate institutions, where appropriate). Particularly local NGOs could also become regular members of such working groups and provide specific services that cannot be delivered by municipal departments.

**Lack of processes and tools for climate finance – Investing in strategic planning for climate change:** Dedicated, long-term climate change strategies are important to determine priorities for climate change action and to assign the climate finance needed to start implementation. Based on such a citywide vision, all sectors should be encouraged to amend their planning instruments where necessary. Developing an overall project pipeline of bankable climate-smart projects will help to prioritise climate action and access international funding. Yet, climate assessment and planning is hampered by several factors, including uncertainty of climate change and lack of skills, tools and data. It is thus suggested to increase cooperation with development cooperation agencies, universities and NGOs. At the same time, it is important that national- and state-level climate (investment) strategies also act as impetus and guidance for municipalities to take action. Where this is not the case, these strategies should be adapted.

## Recommendations

- **Municipal governments:** Develop a citywide climate change strategy and make provisions for mainstreaming key priorities into sectoral strategies and urban planning. Where no climate focal point exists, the strategy should be developed by a multi-disciplinary working group with support from academia and NGOs.





- **Higher-level governments:** Assess whether national climate strategies are conducive for urban climate action (*Do they stimulate urban climate action? Do they have adequate budgets?*).
- **Development cooperation community and NGOs:** Provide technical assistance for the development of climate change strategies.

#### **(Possibly) Inadequate use of available funding – Strengthening monitoring, reporting and verification:**

Neither Santiago nor Chennai tracks climate finance and its impacts. Information on projects with benefits for mitigation or adaptation is dispersed among the different authorities. In eThekweni, the National Treasury keeps track of climate finance but does not publish such information. Consequently, the costs and benefits of climate projects remain unknown to most stakeholders, including national governments. Tracking of climate finance and monitoring, reporting and verification of climate action need to be strengthened to illustrate the net present value of long-term climate projects and to justify expenses before citizens, higher levels of government and donors.

#### **Recommendations**

- **Municipal governments:** Invest into tracking of (climate) finance and sound monitoring, reporting and verification of its impacts. Such tracking and monitoring does not have to be limited to climate finance as this is expected to be mainstreamed into regular development finance for municipalities. Rather, all investment plans should routinely be assessed regarding their contribution to climate change mitigation and adaptation.

**Low relevance of international finance – Making good use of domestic public finance:** It was noted that international climate finance for municipalities has so far been insignificant or ad-hoc and limited to specific sectors. The opinion prevails among many of the interviewed experts that once climate change is mainstreamed into development priorities, funding for climate-compatible development can be made available from “regular” funding sources. If this can be achieved, the argument for additional finance for climate change is no longer necessary or feasible. Moreover, given the need for steady funding for municipal service delivery and the tendency towards mainstreaming of climate

risks across all sectors, municipal revenues and national budget contributions are considered more important instruments for climate action in cities. However, municipalities cannot always make the best use of the available domestic public finance, for example because of restrictive national regulation (e.g. in regard to raising revenue or taking debt) or because intergovernmental transfers do not take climate risks into account. Further, revenue models themselves are changing (due to both climate and non-climate related factors) and such shifts need to be tracked so as to inform future revenue modelling and budgeting processes.

#### **Recommendations**

- **Municipal governments:** Assess which funding sources are most essential for urban climate action and how their availability will be affected in the future.
- **Higher-level governments:** Assess whether policy and regulatory frameworks are conducive for urban climate finance. Relevant frameworks here include intergovernmental transfers (*Do they take climate factors into account?*) and municipal regulation (*Does it allow for experimenting with new financing opportunities? Does it impede partnerships with potential international partners?*).

**Limited access to international climate finance – Increasing knowledge at the local level:** Despite the presently stronger focus on domestic public finance, experts consider international climate finance to be very helpful in funding pilot activities and boosting climate change awareness. However, several challenges impede access to such resources. Funding requirements, especially for international (climate) funds, are often high and application processes are lengthy. Awareness and knowledge of the funding opportunities are generally low among municipal managers, particularly in sectors other than environment and energy. Capacity building and clearer guidance on selection of and application to international funds is required. Cooperation with the national implementing entities, albeit often a challenge itself, can significantly increase the possibility to access climate finance.



## Recommendations

- **Municipal governments:** Exchange information on successful project proposals with other cities, possibly from other (but similar) countries. Become engaged with the national implementing entity (or entities) and sound out opportunities for the collaborative development of a funding proposal.
- **Development cooperation community and NGOs:** Facilitate cooperation between municipalities and national implementing entities to increase access to international climate finance. Develop guidance for municipalities that helps them apply for funding, including compendia of locally relevant sources of climate finance and their investment criteria.

**Low private engagement and finance – Creating attractive projects and other incentives:** The private sector can and has to contribute to climate-smart development of cities in two ways – by lending money or by providing climate-smart infrastructure and services. Yet, the private sector is not actively involved in climate-proofing urban development yet. Unfavourable project profiles have proven to be a major challenge, as oftentimes such projects do not generate stable revenues while also coming with (possibly) higher risk, e.g. if new technologies are used. Municipal borrowing, in turn, is often strictly regulated and hence unattractive to both borrower and lenders. Where the private sector rather than municipalities are in charge of delivering urban services (such as in Chile, where the majority of urban services are privatised), municipal governments have to use their (financial) powers to stimulate climate-compatible development, e.g. by raising awareness, compiling best practice case studies or by establishing price mechanisms to charge for negative externalities.

## Recommendations

- **Municipal governments:** Engage the private sector in climate action, e.g. by illustrating the effects of climate change on industries and by highlighting best practice examples of climate projects with good return on investment. Projects with sound business models can be realised with financial support of private banks (borrowing) or private project developers (through PPPs).
- **Higher-level governments:** Gear up efforts to establish disincentives for behaviour that increase GHG emissions or climate vulnerability, thereby improving the attractiveness of climate-aligned projects and stimulating a private response to climate change.



# About the project

## “Cities Fit for Climate Change”

The global project is commissioned by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). It forms part of the International Climate Initiative (IKI).

### What we do

*How can cities cope with the risks of climate change and become custodians of a liveable climate?* The CFCC global project is focused on finding answers to this question. Because there are no universally applicable solutions, existing concepts for resilient lowcarbon urban development will be analysed and compiled in a sourcebook. The CFCC partner cities, Chennai, eThekweni, and Santiago de Chile will be supported in developing case-specific climate-friendly strategies. The important issue of securing financing for required sustainable investments are also addressed. In the process these steps will facilitate the development of a climate-proof urban development approach, which promotes a new urban design. The lessons and insights from the work will be made available at international conferences and as part of global exchange.

### How we do it

In order to work effectively together with our partners on climate-friendly urban development, this global project is divided into different components:

- Component I: Analysing pioneering approaches to climate change:** In this module, good practice examples from around the world will be collected and assessed. Descriptions of these projects will be compiled in a sourcebook, which focuses on instruments used and guidelines produced. The sourcebook will also incorporate learning’s from the partner cities’ projects.
- Component II: Developing climate-proof city approaches in our partner countries:** The second work package focuses on the partner cities. The local situation is investigated, and available instruments, urban development policies and existing climate change mitigation and adaptation plans are examined. The cities receive advisory services on climate-appropriate urban strategies and will be supported in developing their own climate-proof urban development approach. Financing options for the realisation of measures will be identified according to local requirements. In all three cities, cross-departmental cooperation will be strengthened for more integrated approaches towards climate-friendly urban development.
- Component III: Contributing to the international discourse on urban transformation:** The third module focuses on supporting the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) on disseminating the knowledge gained in work packages I and II, and thereby influencing relevant international discourses. For example, the project was involved in the international process leading to the formulation of the ‘New Urban Agenda’. It now supports its implementation as well as the implementation of the Agenda for Sustainable Development and the Paris Agreement within the United Nations Framework Convention on Climate Change (UNFCCC).



## What has been achieved so far

An integrated approach to climate-friendly urban development has been promoted in all three partner cities by establishing cross-departmental collaboration platforms. A climate change academy in **Santiago de Chile** has not only brought together different departments and sectors but also provided knowledge and training on climate change. Selected urban planning instruments have been improved with a climate change lens. In **eThekweni** a climate resilience plan has been developed and will be included in the Spatial Development Framework (SDF). Climate change aspects have also been mainstreamed in two large municipal infrastructure and urban development projects in Santiago de Chile. The development of sustainable transport strategies has been supported in Santiago de Chile and eThekweni. In **Chennai** the restoration of a canal section is being discussed with the engagement of a multi-stakeholder advisory group.



# 1. Background

Cities have a key role to play in shaping a low-carbon and climate-resilient future. Already today, half of the global population lives in cities, accounting for up to 70% of global CO<sub>2</sub> emissions. At the same time, cities are particularly vulnerable to climate change, as most of the urban population lives in low-lying coastal areas. High population density and concentration of built infrastructure further increase vulnerability (OECD and Bloomberg Philanthropies 2014).

Cities have large potential to reduce greenhouse gas emissions, for example through increased energy efficiency in buildings as well as low-carbon transport and waste management. Cities can also use transportation and land use planning to promote transit-oriented development and compact growth. With regard to adaptation, cities can invest in resilient infrastructure, public health, energy and water security and other fields of action. Considerable investments are necessary in order to unlock this huge potential for mitigation and to seize opportunities for adaptation.

However, cities often have difficulties in accessing and managing finance. For example, cities often lack awareness, knowledge, skills and (financial) resources to strategically integrate climate change issues into local budgeting and planning; to manage available funding; and to access new sources of capital for climate change projects. Other barriers are related to external factors, such as detrimental national policies and difficult access procedures for international climate funds.

Against this background, this study examines different aspects of urban climate finance. The first part of the study, which is based on an in-depth literature review, analyses the status quo of climate finance for cities worldwide and identifies trends, challenges and opportunities for increasing urban climate finance. The second part consists of three interview-based case studies that illustrate both the current situation and potentials for urban climate financing in eThekweni (South Africa), Santiago (Chile) and Chennai (India), the three partner cities of the GIZ global project Cities

Fit for Climate Change. The study illustrates opportunities to increase funding for urban climate action.

In writing this study, a number of challenges were encountered. One particular barrier was the diversity of definitions, approaches and climate finance-related needs across different countries. This makes it difficult to draw general conclusions on what should best be done to improve climate finance for cities in developing and emerging economies. Another challenge for this study was that, essentially, challenges for climate finance are deeply mixed with challenges related to general municipal finance and capacity for climate smart development. While the study will look at the most prominent issues in all these fields, it cannot provide solutions to basic municipal finance and governance issues.

This study has been commissioned by the global project 'Cities Fit for Climate Change'. The project is implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB). It cooperates with various partners internationally and in Germany and in particular in its three partner countries India, Chile and South Africa.

The project aims to strengthen cities as actors of sustainable development. Ultimately, cities are responsible for the development of integrated, resilient and low-carbon instruments for sustainable urban development. The project supports innovative approaches for urban planning and makes cities "fit for climate change". Thus, dealing with climate change should become an integrated and strategic part of urban development. Plans, programmes, strategies, as well as combined investments will be more resilient and adaptable to climate change and tend to prepare the ground for future low-carbon plans, programmes and strategies. One of the project outcomes will be a climate-friendly urban development approach which provides a starting point for thinking about a new urban design.



Lessons learnt from existing concepts of resilient and low-carbon urban development will be analysed during the project. The partner cities in India (Chennai), Chile (Santiago de Chile) and South Africa (eThekweni) will be supported in the improvement of their climate-proofed strategies and their own financing possibilities. Furthermore, the experiences will be shared at international meetings and conferences. The present study is meant to contribute to these objectives and can also serve as inspiration and guidance for similar cities across the globe.



## 2. Status Quo of urban climate finance

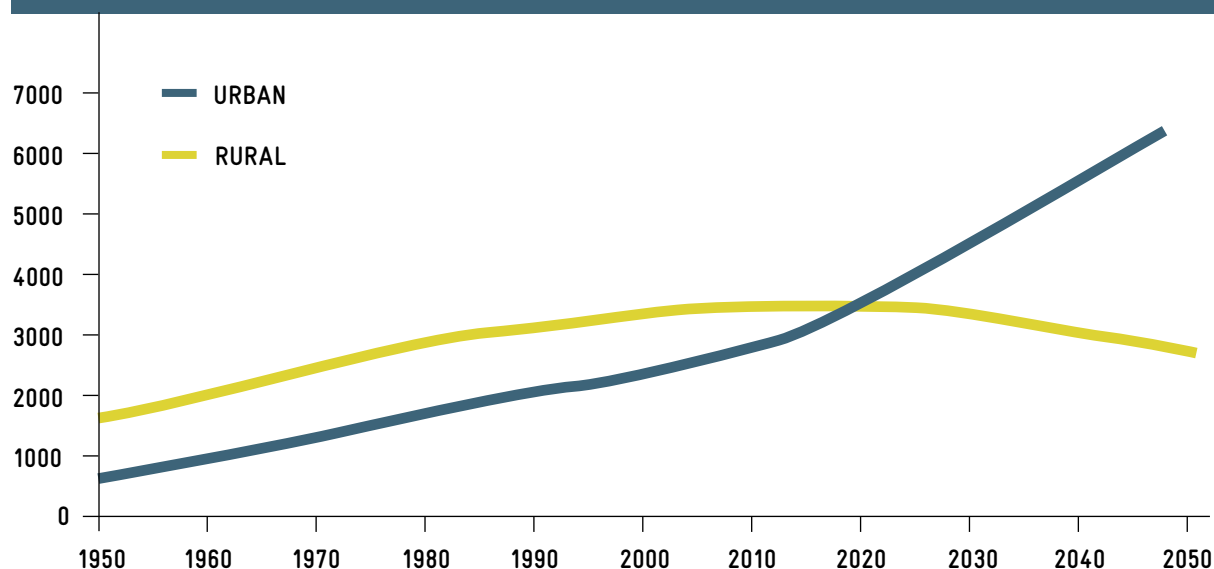
### 2.1. Urban change and corresponding financial needs

#### Urbanisation and population growth

In 2014, 54% of the world's population lived in urban areas. This share is expected to rise to 70% in 2050. In real terms, population growth and urbanisation are projected to add 2.5 billion people to the world's urban population by 2050 (UN-HABITAT 2009).

than one third of the projected growth of the world's urban population between 2014 and 2050 (Department of Economic and Social Affairs 2014).

Figure 1: Urban and rural population of the world, 1950–2050



Source: Department of Economic and Social Affairs 2014

Today, the most urbanised regions include Northern America (82% living in urban areas in 2014), Latin America and the Caribbean (80%), and Europe (73%). In contrast, Africa and Asia remained mostly rural, with 40% and 48% of their populations living in urban areas. All regions are expected to urbanise further over the next decades. Africa and Asia are urbanising faster than the other regions and are projected to become 56% and 64% urban, respectively, by 2050. Nearly 90% of the increase in urban population will be concentrated in Asia and Africa. Just three countries – India, China and Nigeria – together are expected to account for more

#### Climate change in urban areas

Urban areas are highly vulnerable to a wide range of climate change-related phenomena such as rising sea levels, inland floods, rising temperatures, heat waves, stronger and more frequent tropical cyclones, landslides, droughts and water scarcity (van Staden 2014). While cities have always been threatened by natural variations in climate and seasonal weather patterns, human-caused climate change significantly aggravates these phenomena and thus increases climate risks (Solecki et al. 2015). Moreover, climate change phenomena often interact with other apparently



unrelated environmental issues. For instance, rising global temperatures, combined with the ‘urban heat island effect’, aggravate air pollution in cities, thereby increasing health risks (Solecki et al. 2015).

Since the effects of climate change are expected to intensify in coming decades, while urbanisation is predicted to continue at a high rate, cities will face ever-greater climate change-related risks (Knutti 2013; Solecki et al. 2015). In the absence of adequate mitigation and adaptation measures, cities are likely to face large human and material losses in the mid-term and long-term (World Bank 2010).

Urban areas in low-elevation coastal zones are particularly vulnerable to the effects of climate change. If greenhouse gas emissions continue unabated, sea levels might rise by almost one meter by 2100 (World Bank 2010). Given that currently an estimated 13% of the world’s urban population (around 360 million people) lives in low-elevation coastal zones (i.e. at an elevation of less than 10 meters above mean sea level), the effects of rising sea levels would be catastrophic (van Staden 2014). For instance, the value of assets (including homes, public infrastructure and firms) exposed to flood risk from sea level rise and storm surge is expected to increase from 5% of global GDP in 2005 to 9% by the 2070s (World Bank 2010). Meanwhile, global flood losses, currently estimated at US\$ 6 billion, could reach US\$ 52 billion by 2050 (OECD 2015).

The challenges that climate change poses to cities are compounded by the fact that a large share of them are located in developing countries, which often lack the means to implement adequate adaptation measures (UN HABITAT 2015). Many of the countries with the largest urban populations living in the low-elevation coastal zone are highly populated developing countries including China, India, Indonesia, Brazil, Nigeria and Bangladesh.

The severity of climate change effects on cities will depend not just on the extent to which cities can adapt to climate change, but also on the extent to which cities can mitigate climate change by reducing their energy consumption and their greenhouse gas emissions. In other words, just as climate change affects cities, cities also affect climate change. Currently, cities account for about 80% of global greenhouse gas emissions (World Bank 2010). However, there are huge differences in

terms of the intensity of greenhouse gas emissions of cities around the world. Thus, the choices that cities make in coming decades in order to reduce energy consumption, produce or consume clean energy, and curb greenhouse gas emissions, will have a direct effect on the severity of climate change worldwide (van Staden 2014).

## Infrastructure and financial needs

Many countries already face large gaps in the stock and quality of existing infrastructure. According to the World Bank (2014) “1.2 billion people live without electricity; 2.8 billion still cook their food with solid fuels (such as wood); 1 billion live more than 2 km from an all-weather road; 60% of the world’s population lack internet access; and at least 748 million people lack access to safe drinking water”.

This infrastructure gap will be further exacerbated by urbanisation. Investments are needed to keep up with the infrastructure and service needs of the growing population and integrate mitigation and adaptation considerations at the same time. An analysis by the Cities Climate Finance Leadership Alliance CCFLA (2015) suggests that US\$ 4.1–4.3 trillion per year from 2015 to 2030 will have to be spent on urban infrastructure in both developed and developing countries just to keep up with projected growth in a business-as-usual scenario. An incremental 9 to 27% (US\$ 0.4–1.1 trillion) more capital investment will be necessary to make urban infrastructure climate-resilient and to reduce related emissions.

As Godfrey and Zhao (2016) note, these and other estimates are based on a range of uncertain assumptions while also omitting certain aspects, for example that sustainable urban development can also lead to cost savings. Yet, despite the uncertainties and differences between estimates, it becomes clear that there is a significant gap between the demand for and the supply of investment in sustainable cities. Estimates of the urban infrastructure funding gap range from US\$ 400 billion to 1.2–1.5 trillion per annum over the next 15 years (Godfrey and Zhao 2016). With current yearly investments of US\$ 2.7 trillion, the CCFLA scenario might lead to an even more considerable infrastructure investment gap (Kamiya 2016).





## 2.2 Defining urban climate finance

Understanding urban climate finance requires knowledge of the underlying concepts that together define climate finance for urban areas. In the following, the most important terms will be clarified.

### Cities, municipalities and metropolitan areas

- **Urban areas:** The definition of “urban” often depends on a minimum population threshold (ranging from 200 to 50,000 people). Other common criteria include higher population density, presence or predominance of non-agricultural activity and/or presence of urban infrastructure. Other definitions of urban areas follow administrative or political boundaries (Deuskar and Stewart 2016).
- **City:** A major population centre providing a range of urban services within the municipal boundaries. Definition in terms of population varies widely among countries (UN HABITAT 1992).
- **Municipality:** A legally constituted city, town, village, county, township, district or other entity having powers of local self-government; a community under municipal jurisdiction (UN HABITAT 1992). This study looks at two municipalities, namely that of Chennai (India) and eThekweni (South Africa).
- **Metropolitan area:** “an area constituting a single economy and labour market, a community with common interests and joint actions; often including a number of local government jurisdictions” (Andersson 2014). This study looks at one metropolitan area in particular, namely the Metropolitan Region of Santiago (Chile) which is made up of 52 urban and partly rural communes. These communes are, in turn, administered by autonomous municipalities.

### Climate projects

A “climate project” should address one or both of the following objectives:

- **Mitigation**<sup>2</sup>: Entails reducing greenhouse gas (GHG) emissions through 1) reduced use of fossil energy

2 According to local experts differentiating between mitigation and adaptation is not always conducive to urban climate projects. Often, activities can be categorised as both mitigation and adaptation.

carriers and other activities leading to GHG emission or 2) carbon sequestration. In an urban context, climate change mitigation can best be achieved by investing into low (or no) carbon buildings, transport, energy production and waste management. Further reductions can be achieved by creating carbon sinks, e.g. green spaces (Bloomberg 2014), UNEP (2014).

- **Adaptation:** Refers to all activities that reduce the effects caused by climate change, for example by strengthening adaptive capacity and reducing exposure or sensitivity to climate phenomena. Relevant urban projects include, for example, flood protection and drainage systems, measures to increase energy and water security, climate-resilient infrastructure, etc.

Even though this definition is widely used, two issues have emerged:

- Mitigation and adaptation are often not the main objectives of sustainable urban development but can be co-benefits. According to the OECD DAC Rio Markers for Climate, projects where mitigation and/or adaptation are not significant or principal objectives, are not considered climate projects and, thus, cannot receive international climate finance (OECD 2011). If climate change is mainstreamed into general developmental projects, e.g. to increase public transport, potential recipients need to clearly indicate how these projects differ from traditional approaches<sup>3</sup>. This process can be very time-consuming and has reduced the attractiveness of internal climate finance.
- Climate activities can fall into both categories at the same time<sup>4</sup>. By categorising such measures as either mitigation or adaptation their total societal benefits will likely be underrated.

3 For example, if the process of mainstreaming climate change into a traditional power project results in the project being redesigned so that it instead relies on renewable energy and energy savings, the entire activity can be considered as having climate change mitigation as its principal objective.

4 For example, investments into small-scale decentralised renewable energy reduce greenhouse gas emissions from cooking with fuel wood while also improving poor households’ adaptive capacity

## Climate mainstreaming

Climate mainstreaming is defined as incorporating climate change considerations into broader development strategies and sectoral plans. This is important because in cities, climate protection and adaptation are often co-benefits of activities targeted at poverty reduction (creating jobs in the renewable energy sector), transport (introducing biofuel-based public transport to reduce fine dust pollution), education (training on disaster and disease management) and other urban development priorities (UNEP 2014). Mainstreaming makes sure that available (non-climate specific) funds are used efficiently and with co-benefits for mitigation and/or adaptation.

## Climate projects in the urban context

In the context of urban areas, climate-smart development is commonly linked to the quality of infrastructure. Given long lifespans, cities need to make sure that new or refurbished physical assets produce as little GHG emissions as possible in order to avoid locking in carbon emissions. Moreover, infrastructure should itself be resilient to climate change and reduce citizens' vulnerability.

Another important concept is that of compact and connected cities. By avoiding urban sprawl and investing into low-carbon mass transit systems, urban GHG emissions can be reduced. Simultaneously, compact cities are often considered to be more productive and inclusive, i.e. because they allow for greater employment density, easier access to economic areas, etc. (New Climate Economy 2014). In contrast to the compact city, the “de-concentrated and perforated” city has emerged as another model. It aims at selectively reducing compactness and density of space and population within existing urban structures. The resulting heterogeneity of spatial and urban functions creates new qualities for leisure, ecological recovery and regional adaptation (Knieling et al. 2012).

Additionally, climate-smart development also requires investments into food security, disease prevention, disaster risk management and other aspects of resilience building. In contrast to physical infrastructure, such projects are often implemented over time and thus require less upfront funding. Nevertheless, they should not be omitted when planning the cities of the future.

## Climate finance

For the purpose of this study we define climate finance as: “Climate finance concerns any financing that is tied specifically to projects or program[me]s for climate change mitigation or adaptation” (UNEP 2014). Such financing can come from public or private sources and can be sourced internationally, regionally, nationally or locally.

In the international context, climate finance often refers to the transfer of finance (and/or other resources) from developed to developing countries for climate-related actions. This definition omits funding for climate change projects between and within developing countries and investments made by the private sector. Moreover, there are a number of (theoretical) limitations to international climate finance<sup>5</sup>. Firstly, it should only be used to fund “additional” projects that would not be necessary if it were not for man-made climate change (Yan and Hurwitz 2013). In some contexts, additionality is considered to be a binary quality: either a project is additional or not. In other contexts, additionality is quantified, with climate finance being made available to cover the estimated incremental (or “extra”) cost between the business-as-usual scenario and the project scenario<sup>6</sup> (UNDP 2016). Moreover, international climate finance should be used primarily to reduce the incremental costs of climate projects (rather than to fund the project itself), i.e. by increasing project revenues, reducing project costs, improving the investment climate and stimulating private investment (Falconer et al. 2014).

In reality, international climate finance mechanisms often “fail” to exclude non-additional projects. With climate change becoming more and more mainstreamed into development strategies, additionality and incremental costs are increasingly difficult to proof. Whether or not these concepts will continue to characterise international climate finance is uncertain<sup>7</sup>.

<sup>5</sup> Domestic and private climate finance is usually less restrictive and often mixes with general municipal finance (i.e. funding for urban development).

<sup>6</sup> In the case of electrical buses, for example, international climate finance will be provided for the difference in costs between electrical and fuel-powered buses. This approach is based on the understanding that climate-compatible development is often more expensive than “traditional” carbon intensive development and, hence, requires additional funding in excess of regular development assistance.

<sup>7</sup> See, for example, Ashford (2015) for a discussion of additionality in the context of the Paris Agreement.



## Urban climate finance

There is no agreed definition of urban climate finance. However, based on the explanation of climate finance provided above, urban climate finance can be described as funding for projects with co-benefits for climate change mitigation and/or adaptation in urban areas<sup>8</sup>. For the purpose of this study, we further narrow down the term to funding that local urban governments can (potentially) tap in order to make their cities more climate-smart and resilient.

## Public and private finance

Public finance is funding provided by an entity that is owned to a major share by the government or government-controlled institution. This includes ministries and any other executing agencies of the government as well as all public (development) finance institutions. All of these sources of public funding will be discussed throughout the study as they are often highly relevant for local level investments.

Private finance, in turn, encompasses two different forms of funding with varying degrees of ownership over the asset. Private investment refers to financing of assets that are in majority privately owned. Private capital, in turn, means that the project is funded with third party financing from the private sector (Stumhofer et al. 2015). Local governments can stimulate private investments in climate projects via favourable investment policies and other incentives. They cannot, however, control and steer private investments towards any particular project. Private capital, which is essentially borrowing from private financial institutions or capital markets, can be used freely by urban governments to finance public goods or services, as long as these comply with the lenders' requirements.

<sup>8</sup> Paulais (2012) points out that urban climate projects can take place in rural areas, for example if a city's the landfill is situated outside of the city boundaries.

## Operating expenditure and capital expenditure

Operating expenses (abbreviated Opex) are expenses that an organisation (here: municipality) incurs through its normal operations (e.g. building rents, personnel costs, equipment costs, utility payments and other regularly occurring expenses). In relation to urban infrastructure, Opex mainly comprise costs for operation, maintenance, refurbishment or decommissioning and re-payment of debt.

Capital expenditures (Capex), in turn, are funds used by an organisation to acquire or upgrade physical assets such as property, buildings or equipment. In the case of infrastructure, Capex typically refers to the costs for project preparation and construction.

In municipalities, funding will first be used to cover basic service delivery and related Opex. Yet, real progress in climate-smart and resilient development will require considerable Capex, for instance into more sustainable transport infrastructure.

## Climate finance readiness

Climate finance readiness (CFR) is one of the key concepts that help to describe international cooperation “to support the capacities of developing countries and emerging economies to access and use international climate finance as effectively as possible” (GIZ 2013). However, as the five dimensions of GIZ's CFR approach<sup>9</sup> indicate, the capacities are not only referring to enabling international access but also include the mobilisation of financial flows at the national level – both from national governments and the private sector.

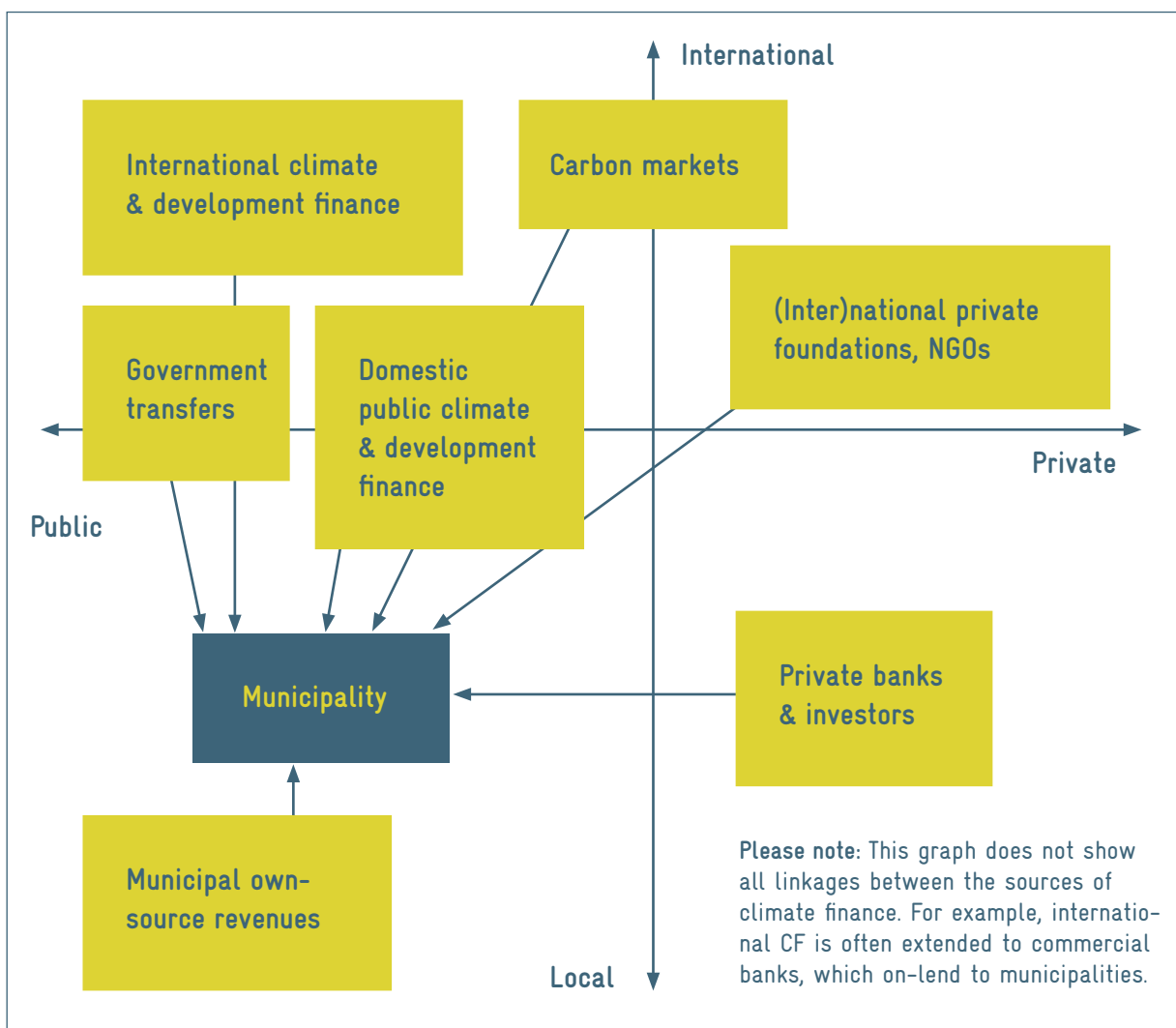
<sup>9</sup> GIZ CFR approach (GIZ 2013) consists of 1) strategic planning and developing policies 2) strengthening institutions and good financial governance 3) accessing international climate finance 4) effective and transparent spending and implementation and 5) promoting private sector engagement.

## 2.3 Sources of funding for urban climate projects

This chapter analyses the sources of funding that local governments can potentially tap for climate-aligned development of internal and external factors<sup>10</sup> allow them to do so. Funding can come from public or private sources at the international, national or sub-national level (figure 2). In most cases, municipalities have to use a mix of funding sources to pay for climate-compatible urban projects.

The majority of these funding sources are common sources for urban development. However, specific climate funds and programmes have further diversified the financing landscape.

**Figure 2: Sources of funding for urban climate-aligned development**



Source: adelphi

<sup>10</sup> Chapter 3.2 describes and discusses the internal and external factors that determine whether or not governments can access and effectively manage funding. Internal factors include awareness and political priority, capacity and skills, as well as institutions and tools. External factors refer to regulation, project profiles, investment environment and funding requirements.



## Methodology for describing and analysing funding sources

The funding sources are described and analysed according to the following guiding questions:

### Instrument

- How does the financing instrument work?

### Relevance for local governments

- Can local governments decide on the use of the capital provided?
- Which restrictions reduce the local use of certain instruments?

### Relevance for urban climate projects

- Can the money be used to fund urban climate projects?
- If yes, which size and type of urban climate project can be financed?
- Which types of costs can be covered?

## 2.3.1 Municipal own-source revenues

### Instruments

Cities and municipalities have different ways of collecting revenues from local citizens and businesses. These revenues remain within the municipality for direct use.

### Charges

User charges are levied for the consumption of certain goods or services (e.g. water, electricity, public transit, parking, road use, waste collection). They are used to pay for the delivery of the respective service (Slack 2011).

A development charge is imposed on project developers when planning permission is granted to carry out development projects. The development charge will be used by the municipality to build necessary infrastructure (Junghans and Dorsch 2015).

Municipalities can also levy charges for special building rights that allow the property owner to build higher or denser than it is typically allowed (land-value capturing).

### Taxes

Taxes can be charged on property, income, sales, business activity and other goods or activities.

Revenue generated through taxes depends on the value or size of the underlying product or activity.

### Other

Other sources of local revenue include, for example, land sales and leaseholds, rental income, interest and investments, traffic fines, licenses and permits, agency services, entrance fees for use of local facilities and other sources.

### Relevance for local governments

In most developing countries, municipal own-source revenues are made up from user fees and property taxes. Yet, especially property taxes are often not very significant in terms of revenue collected. More lucrative revenue sources, such as income, sales and fuel taxes are often charged by higher-level (i.e. central or provincial/state) governments to reduce transaction costs and to avoid congesting revenues in a small number of economic hubs (UN-HABITAT 2009).

Many municipalities cannot collect sufficient revenues and are highly dependent on external funding, such as national government transfers (see chapter 2.3.2). This is particularly true for smaller, more rural and/or less economically attractive municipalities. Cities with dense residential/commercial areas and strong economic activity often generate more revenue from taxes and fees.

### Relevance for urban climate projects

User or development charges and a number of other fees are levied to pay for specific services or infrastructures. Hence, such charges can only be used as “climate finance” if 1) the service or infrastructure itself has

climate co-benefits<sup>11</sup> or if 2) surplus revenues are generated that can be re-directed to climate-smart activities (Junghans and Dorsch 2015).

Most other revenues are not as clearly linked to specific services and can be used to fund projects that are in line with the respective authorities' mandates<sup>12</sup>. Hence, whether or not they can serve to pay for climate projects depends on the mandate, priorities and overall budget of each authority.

Municipal revenues are collected on a monthly or yearly basis and do not usually suffice to cover large one-off investments. Hence, own-source revenues are most appropriate to pay for less capital-intensive but more regular activities, such as the preparation of feasibility studies, maintenance of climate-smart infrastructure or debt service. Whenever possible, public money should be used to leverage private investments, e.g. by paying for thorough project preparation or marketing of projects.

## 2.3.2 Intergovernmental transfers

### Instruments

The majority of municipalities across the globe obtain some form of funding from higher levels of government, including provincial and/or central governments.

### Intergovernmental transfers

Intergovernmental transfers refer to the sharing of revenues between different levels of government, often from national or state governments to lower-levels of government. Higher-level territorial governments typically earn greater revenues than provinces or cities. Parts of revenues are then shared to pay for public goods and services (particularly if their benefits spill over municipal boundaries).

<sup>11</sup> For example, if electricity is produced from renewable energy plants (electricity charge) or if areas for development are linked to the city centre via low-carbon mass public transit (development charge).

<sup>12</sup> Ideally, property taxes should be directed to services where individual beneficiaries cannot be identified but there are collective benefits (e.g. street lighting, parks). Income and sales taxes are most relevant for redistributive services (e.g. social housing) Kitchen and Slack 2015.

Intergovernmental transfers can be unconditional (to be used for any purpose) or conditional (to be used for specific, pre-defined purposes). They do not have to be paid back (Paulais 2012).

### Relevance for local governments

Many local governments depend heavily on inter-governmental transfers (UN-HABITAT 2009). As the main purpose of such transfers is to make sure that lower levels of government have the required financial resources to fulfil their mandates, intergovernmental transfers should be designed to accommodate for the different characteristics of municipalities. Moreover, they should be regularly reviewed to make sure that they are still aligned with local realities. Yet, many cities suffer from unstable or inadequate transfers.

### Relevance for urban climate projects

- Conditional intergovernmental transfers have to be used for the stated purpose(s). If conditional grants are not fully spent, municipal governments can or cannot usually use the difference for other activities, depending on the national context. Thus, it depends on the characteristics of such funds whether they can be used to fund activities with benefits for adaptation or mitigation.
- Unconditional transfers should also be used to fulfil basic municipal functions.

In both cases, mainstreaming of climate-related objectives into traditional urban development sectors will increase the revenue base for climate projects.

## 2.3.3 Other domestic public climate and development finance

### Instruments

Most national governments have set up Specialised Financial Institutions (SFIs) such as national development banks, dedicated (climate/urban/rural) funds and other state-owned investment vehicles. These provide financial support for meeting public policy objectives and to leverage private investments (Smallridge et al. 2013). The same services can also be provided by





higher-level governments themselves. With easier access to public funding and capital markets, specialised financing institutions and national/state-governments can provide money at below-market rates (Cochran et al. 2014).

---

## Grants

Grants do not have to be paid back.

## Concessional loans

Concessional (soft) loans have more favourable terms than market-rate loans from private lenders. Often, they have low interest rates and long repayment periods.

## Equity

Specialised Financial Institutions may make equity contributions to qualifying businesses, special purpose vehicles and joint ventures.

## Guarantees

Guarantees are not funding but rather ensure that debt is paid back in case the original lender has financial difficulties and cannot repay.

## Other risk management products

SFIs can further reduce the risks of borrowing by providing, for example, currency swaps and interest rate caps. In case of unforeseen changes in interest rates, currencies or other factors, borrowers are guaranteed stable conditions and can continue to serve their debt under the predefined conditions.

---

## Relevance for local governments

Grants, loans, equity and guarantees provided by SFIs can be highly relevant for local governments as they often reduce the risk of local investments and attract additional private capital. Development banks and funds can also extend funding to commercial banks, which then on-lend to local governments, or to private investors (Smallridge et al. 2013).

## Relevance for urban climate projects

- Grants are highly relevant for climate projects that do not create stable revenues or cost reductions. Moreover, they can be used to reduce loan costs or function as additional collateral.
- Concessional loans, in turn, can be used to fund large-scale capital expenditures for infrastructure that is expected to create revenue streams or cost reductions.
- Equity is also relevant for funding large-scale infrastructure projects in early stages of development.
- Guarantees and risk management products help to improve the risk profile of climate projects that are based on new technologies or that have long amortisation periods.

The majority of funding from national SFIs is not tied to specific climate objectives but rather serves to support public policy objectives. Hence, such funds can be used to fund climate objectives wherever these are mainstreamed into the public agenda and development strategies.

However, there are also dedicated national climate funds (e.g. the Green Fund in South Africa), and specific climate programmes. It depends on the regulations of each SFI for which kind of expenditure this funding can be used. As pointed out by Junghans and Dorsch (2015), the national public climate finance landscape is highly diverse and cannot be summarised here.

### 2.3.4 International public climate and development finance

Multi- and bilateral climate funds and development banks make up another potentially relevant source of funding for urban climate projects. Table 1 presents an overview of funds and development financial institutions that provide funding for climate-related investments<sup>13</sup>. For more detailed information on each of these funding sources, see Annex I. However, it needs to be noted that the vast majority of these sources cannot be directly accessed by local governments.

of Finance 2016). For example, the Clean Technology Fund (CTF) combines grants and loans, with the grant component typically amounting to at least two-thirds of the total investment.

- Development banks clearly focus on providing concessional loans. Moreover, they provide grants and equity and also apply other funding instruments.

Funding instruments vary by investment targets. For example, grants represent 88% of adaptation finance approved by climate funds (UNFCCC Standing Committee of Finance 2016).

Table 1: Multi- and bilateral funding sources for urban climate projects<sup>14</sup>

Multilateral (climate) funds	Multi- and bilateral development banks
<ul style="list-style-type: none"> <li>• Adaptation Fund (AF)</li> <li>• Clean Technology Fund (CTF)</li> <li>• Global Environment Facility (GEF)</li> <li>• Green Climate Fund (GCF)</li> <li>• Least Developed Countries Fund (LDCF)</li> <li>• Pilot Program for Climate Resilience (PPCR)</li> <li>• Special Climate Change Fund (SCCF)</li> </ul>	<ul style="list-style-type: none"> <li>• African Development Bank (AfDB)</li> <li>• Asian Development Bank (ADB)</li> <li>• Corporacion Andina de Fomento (CAF)</li> <li>• European Investment Bank (EIB)</li> <li>• Inter-American Development Bank (IADB)</li> <li>• World Bank and its subsidiaries</li> <li>• Nat. development banks (AFD, KfW, JBIC, etc.)</li> </ul>
Other multi- and bilateral public finance	
<ul style="list-style-type: none"> <li>• Climate Change Resilience Trust (UK, Rockefeller Foundation, ADB)</li> <li>• Local Climate Adaptive Living Facility (UN Capital Development Fund)</li> <li>• Global Climate Change Alliance+ (EU COM)</li> </ul>	<ul style="list-style-type: none"> <li>• International Climate Initiative (Germany)</li> <li>• International Climate Fund (UK)</li> <li>• NAMA facility (UK, Germany)</li> <li>• Global Climate Partnership Fund (Germany, UK, Denmark)</li> <li>• Global Climate Change Initiative (USA)</li> </ul>

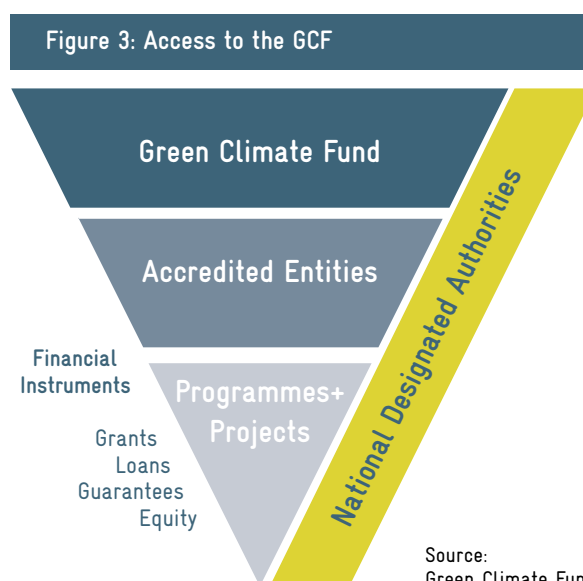
Source: Nakhooda et al. 2015, websites

### Instruments

Multi- and bilateral financial institutions use the same instruments to channel funding as national specialised financial institutions, including (concessional) loans, grants, equity and guarantees. The mix of instruments varies by funding source.

- Multilateral climate funds use mainly grants and concessional loans (UNFCCC Standing Committee

### Relevance for local governments



Source: Green Climate Fund

<sup>13</sup> Programmes addressed primarily at energy, transportation, health, etc. can of course also serve to fund urban projects with benefits for mitigation or adaptation but will not be discussed here due to space limitations.

<sup>14</sup> There are certainly more source of multi- and bilateral funding for climate change-related investments in urban contexts. Due to time limitations, we assessed only those entities identified by Nakhooda et al. (2015) as part of the international climate finance architecture.





- **Access to (climate) funds**

Funds do not usually interact with local governments. Rather, money is channelled through accredited implementing entities, most of which are international organisations (UN agencies, development banks). The Green Climate Fund and Adaptation Fund also allow for regional or national entities to become accredited.

In addition to the implementing entities, national designated authorities or focal points have to be set up to coordinate all funding activities within their respective countries. They are often responsible for communicating the funds' objectives, approving funding proposals before submission to the funds and making sure that projects are complementary and effective. They are usually central government agencies or officers.

Through the national designated entities and implementing entities, capital is channelled to the executing entities that are responsible for actual project implementation. These entities can be (local) government agencies, civil society organisations, private sector companies, research institutions or other organisations. For municipal governments to access climate funding, they have to develop joint proposals with implementing entities and coordinate them with national focal points.

Some climate funds, e.g. the Adaptation Fund, have specific funding windows for “urban development”. These are specifically designed to address urban adaptation challenges and to involve local government authorities. However, funding still has to go through the accredited entities.

Some opportunities for more direct access to international funds are provided, for example, by the GEF Small Grants Programmes and the Urban Climate Change Resilience Trust. See Annex I for a more detailed description of these funding opportunities.

- **Multi- and bilateral development banks**

Multi- and bilateral development banks do not usually provide funding directly to cities but rather channel money through sovereign loans, national banks, specific urban development funds, and private-sector lending and public-private partnerships (PPPs).

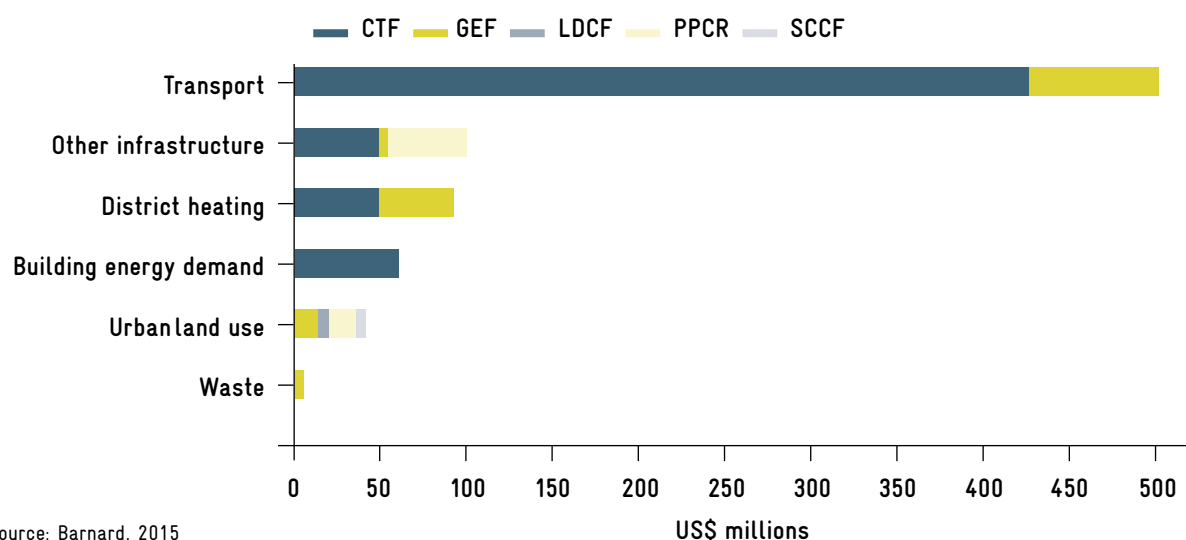
Some examples of development financial institutions that provide direct funding for cities are the IFC (through its Subnational Finance Programmes) and the French Development Agency (AFD) (through “sub-sovereign” loans). See Annex I for a more detailed description of these opportunities. When lending directly to cities, development banks often require central government guarantees (Paulais 2012).

## Relevance for urban climate projects

- **Target sectors**

Analysis of multilateral climate funds by Barnard (2015) shows that the major share of urban projects funded by the selected funds was focused on mitigation. Especially transport is an important recipient of funding, followed by other infrastructure, heating and building energy demand (figure 4).

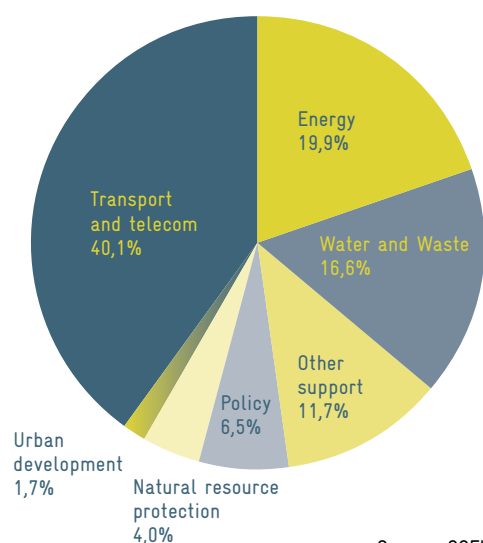
Figure 4: Urban climate finance from funds, by focus and fund, 2010-2014



Source: Barnard, 2015

CCFLA analysis of urban climate finance by multi- and bilateral development banks (CCFLA 2015) shows that the focus on transport and energy also holds true for funding distributed through development banks (figure 5). Overall, Canales Trujillo et al. (2015) come to the conclusion that compared to mitigation, adaptation remains underfunded.

**Figure 5: Urban climate finance from development banks, by sector, 2014**



Source: CCFLA 2015

• **Type of activities funded**

According to Barnard (2015), multilateral climate finance can be extended to cofinance specific investment projects and to establish an enabling environment for investment.

- Funding is most commonly extended to pay for technical assistance and capacity building to improve policy frameworks or credit ratings, develop action plans, etc.
- Funding can also be provided to increase the climate-related benefits of development projects (e.g. by paying for feasibility studies to determine the benefits of climate-smart over business as usual approaches) or to cover the additional costs of climate-compatible investments.
- Some funds and the majority of development banks can also cover “regular” project costs, i.e. those costs that would occur even if the investment was not climate-aligned.
- Finally, climate funds can also channel concessional finance through intermediaries for incentivising markets in a specific sector.

**Table 2: Investment criteria of the GCF and AF**

GCF (Green Climate Fund 2015a)	AF (Adaptation Fund 2015)
Applicants must describe the expected project performance against six investment criteria:	In assessing project and programme proposals, the AF gives particular attention to:
<b>Impact:</b> The project or programme contributes to e climate mitigation and/or adaptation.	Consistency with national sustainable development strategies.
<b>Paradigm shift:</b> The project contributes to a shift in the developmental paradigm towards a low-emissions, climate-resilient sustainable path, rather than simply ameliorating the consequences of high-emissions development models.	Economic, social and environmental benefits from the projects.
<b>Sustainable development:</b> The project has environmental, social and economic co-benefits and gender-sensitive development impacts.	Meeting national technical standards (where applicable).
<b>Needs of recipient:</b> The project answers to the real needs of the identified beneficiary groups.	Arrangements for monitoring and evaluation and impact assessment.
<b>Country ownership:</b> The project is in line with the country’s climate strategy and priorities, fits to the capacities of the accredited or executing entity and involves stakeholder engagement.	Arrangements for management, including for financial and risk management.
Financial efficiency and effectiveness.	Cost-effectiveness of projects and programmes.
	Avoiding duplication with other funding sources.
	Moving towards a programmatic approach (where appropriate).



- **Investment criteria**

Urban climate projects can be funded through international climate finance when and if they comply with the respective fund's or development bank's investment criteria. Table 2 provides an overview of the investment criteria of the GCF and AF.

## 2.3.5 Private finance and investments

### Instruments

Municipal governments can tap private capital by borrowing from commercial banks or other private financial intermediaries as well as private (institutional or individual) investors. Private capital usually comes at market rates and requires rigorous risk management.

#### Loans

Loans can be obtained from commercial banks and other private financial institutions. The borrower receives the loan as a lump sum and pays it back in regular instalments over a certain time period. The repayment instalment, interest rate, repayment schedule, grace period, collateral requirements and other aspects of the loan terms depend on the borrower's creditworthiness and on the risk profile of the project that is to be funded. However, municipalities are often not allowed to take on private loans and if they are, their creditworthiness might be limited.

#### Bonds

Bonds are sold directly to investors. The money raised through bonds has to be paid back upon maturity of the bond. The issuer pays regular interest payments to the bond holder.

#### Equity

Private equity can be brought in through PPPs.

#### Public private partnership

In a public-private partnership (PPP), a private investor finances all or part of the investment into a revenue-generating infrastructure (telecommunications, electricity, railways, etc.), earns money from

the revenue that it generates, and eventually hands ownership over to the local government (Paulais 2012).

The typical set-up for a PPP is a so-called Special Purpose Vehicle (SPV) that allows for non-recourse financing. These SPVs are usually highly leveraged, i.e. debt-driven, while private equity often covers only small parts of the investment.

### Relevance for local governments

Municipal borrowing is usually restricted by regulation and is thus not available to all cities. Where allowed, loans and bonds provide access to large sums of money at a single point in time. This allows cities to make larger investments than would be possible through municipal revenues. Cities can use municipal bonds to finance either large infrastructure investments or a group of smaller projects that would not be financed by investors if offered individually.

However, loans and bonds are debt instruments, meaning that the money has to be paid back over time. Repayments are funded from revenues that are then not available for other uses (Slack 2011). Moreover, many municipalities already have significant debt levels and should not take up additional debt without thorough assessments of their repayment capacity (Z/Yen Group and WWF 2015).

In theory, PPPs are very interesting instruments for local governments as they allow municipalities to avoid having to pay for up-front costs. Thereby they enable large-scale projects even if government funding is constrained (Slack 2011). However, only few urban services can serve as income sources for the private sector. Very often, a private sector operator cannot recover investments through user fees alone; public financing remains necessary. Market-priced financing for private project developers is usually more expensive than donor-funded concessional loans and grants. Moreover, a complex contractual structure is required between the SPV and the municipality. Due to these issues, both investors and municipal officials are often hard to convince of PPPs (Paulais 2012).

## Relevance for urban climate projects

Borrowing and bond issuance are most adequate for projects with clear revenue streams that can be used to repay the debt. This is certainly a barrier for climate projects that do not generate (regular) revenues. Particularly adaptation is not usually linked to any goods or services that can be sold. Mitigation projects, on the other hand, more often have economic co-benefits. Examples include revenues from renewable energy and low-carbon public transport.

As private and institutional investors are often risk averse, climate projects that are based on proven technologies or business concepts will have a better chance to be funded. The global climate-related bond market is currently estimated at US\$ 503 billion. Municipal bonds are a small share of this, less than US\$ 2 billion (New Climate Economy 2014).

### 2.3.6 Other international climate finance

#### International philanthropic finance

Some private foundations, such as the Rockefeller Foundation, actively promote urban climate action. While the majority of funding is earmarked for technical assistance, foundations can also provide finance for selected projects. Such funding is usually provided in the form of grants.

#### Carbon market

The international carbon market was created to support countries with commitments under the Kyoto Protocol.

- Under Clean Development Mechanism (CDM), countries can obtain certified emission reduction (CER) credits for projects that lead to carbon savings.
- Under the Joint Implementation (JI) mechanism, countries can earn emission reduction units (ERUs) by funding emission-reduction projects in other countries.

Both CERs and ERUs can be sold and traded, thereby creating an incentive to reduce GHG emissions and serving as a source of funding.

At the COP17 (2011), Parties decided that a new international market mechanism (NMM) should be established under the UNFCCC that will complement the CDM and JI. This mechanism is still under development (UNEP 2014).

#### Relevance for local governments and urban climate projects

Access to international private sources, such as foundations, can be difficult for municipalities. Local implementation projects are usually identified through an active search for candidates rather than through open application processes. As is noted by Junghans and Dorsch (2015), “this suggests a preference for top-down grant making”. For example, interested entities can apply for grants from the Rockefeller Foundation but only very few projects are funded.

Carbon trading mechanisms can be applied to local projects leading to carbon savings. However, carbon credits are not currently a promising instrument for local governments as carbon markets have “collapsed amid a lack of demand from credit buyers, an uncertain continuation of the Kyoto framework, and critiques of the mechanisms themselves” (Paulais 2012).



## 2.3.7 Summary: Funding for different stages of infrastructure development

As described previously, sustainable infrastructure plays a major role in climate-smart development. Table 3 provides an approximate overview of how the different funding sources can be used throughout the lifecycle of an infrastructure project.

**Table 3: Funding for different stages of infrastructure development**

Stage	Funding sources
Project preparation, feasibility studies	<ul style="list-style-type: none"> <li>• (Inter-)National development banks (grants, technical assistance)</li> <li>• Climate funds (grants, technical assistance)</li> <li>• Municipal budget (own-source revenue, intergovernmental transfers)</li> <li>• [Multi-/bilateral development agencies, project preparation facilities, international initiatives and NGOs (mostly only technical assistance)]</li> </ul>
Construction/Implementation	(Inter-)National development banks (concessional loans, equity) Climate funds (grants for adaptation, concessional loans for mitigation) Private finance (market-rate loans, bonds, equity) or PPPs > Where allowed and feasible, municipalities can borrow from these sources directly. Otherwise, debt can be taken up and on lent by higher-level governments or specialised financial institutions. > These founding sources can often provide guarantees, risk management products, grants, etc. to improve municipal creditworthiness or reduce costs of capital. Municipal budget (own-source revenue (particularly development charges, tax revenue or other revenues assigned to the participating departments/authorities in charge), intergovernmental transfers)
Operation, maintenance and debt service	Municipal budget (own-source revenue (particularly user fees, tax revenue or other revenues assigned to the departments/authorities in charge), intergovernmental transfers)
Refurbishment or decommissioning	<ul style="list-style-type: none"> <li>• (Inter-)National development banks (refinancing)</li> <li>• Private finance (refinancing)</li> <li>• Municipal budget (own-source revenue, intergovernmental transfers)</li> </ul>

## 2.4 Measuring urban climate finance

### 2.4.1 Challenges for measuring finance flows

Measuring climate finance is an important task that can help to identify funding gaps for particular target countries, target investments and recipients. Yet, as is explained in much detail in the Biennial Assessment and Overview of Climate Finance Flows (UNFCCC Standing Committee of Finance 2016), several challenges hamper tracking of climate finance flows. These factors lead to the result that any measurement of urban climate finance is incomplete and almost certainly underestimated.

#### Challenges at the national and local levels

- **Defining climate finance:** A universal definition of climate finance does not exist. Particularly at the local level, climate finance might not be a particular concept as many aspects of climate change adaptation (and, to some extent, mitigation) are blended in with other development objectives. A large share of climate investments is funded through the local authority's general budget, or through traditional debt markets not targeted at climate measures.

- **Tracking climate finance:** Cities and other levels of government often have limited institutional capacity to track climate finance. In addition to the lack of a clear definition, reporting is hampered by other difficulties. Especially in developing countries, climate finance is divided between on budget and off budget spending with different accounting and reporting procedures. Monitoring systems are often not in place or are not implemented fully. Due to the overlaps between mitigation and adaptation<sup>15</sup> and to the sharing of responsibilities for climate-related projects between different sectors, double counting is difficult to avoid.

### Challenges at the global level

- **Obtaining data:** Difficulties with measuring climate finance at the (sub-)national level leads to data gaps at the global level. Even if data is available, it might not be shared freely and regularly by the organisations holding it. Particularly in the private sector, restrictions based on confidentiality often reduce climate finance reporting.
- **Aggregating climate finance:** Climate finance comes from a large number of sources and is distributed through different channels and financial vehicles. Definitions, methodologies and assumptions for tracking and reporting climate finance vary between individual organisations, countries and cities. Such numbers cannot simply be aggregated. Yet, reviewing all information provided is a major task. Even the UNFCCC Standing Committee of Finance (2016), which is responsible for measuring climate finance at the global level, states that biennial reports are not reviewed in time for aggregating data for the biennial assessments.

<sup>15</sup> For example: Decentralised renewable energy production reduces CO<sub>2</sub> emission and increases energy security; green spaces simultaneously function as carbon and heat sinks; etc.

## 2.4.2 Estimates of global climate finance flows

Despite the challenges described, some studies attempt to measure global climate finance flows. Neither of these studies measure subnational or municipal public budgets spent on climate projects.

According to the **Biennial Assessment and Overview of Climate Finance Flows** (UNFCCC Standing Committee of Finance 2016) global total climate finance was US\$ 741 billion in 2014, up from US\$ 687 billion in 2013. This number includes climate finance and investments by public and private sources. Yet, the amount of climate-related finance flows would be higher if significant data gaps in critical sectors such as sustainable transportation, agriculture, energy efficiency and resilient infrastructure were closed. Additional adjustments to domestic public finance expenditures have not been included, which again downsizes the measured climate finance as compared to real finance flows.

The **Climate Finance Landscape**, which is prepared by the Climate Policy Initiative (Buchner et al. 2015), estimates that global climate finance flows reached US\$ 391 billion in 2014, up from US\$ 331 billion in 2013. This figure is much lower than that calculated for the Biennial Assessment because private sector investments were tracked only partly while other significant finance flows were not measured at all. Moreover, the report does not track domestic public budgets.

The following table provides an overview of public and private climate finance by funding source. Where available, information on urban climate finance was included. Please note that these figures cannot simply be added up as some categories overlap. The majority of the figures were taken from the Biennial Assessment. Where this is not the case, the source is stated in parentheses.

<sup>16</sup> Adaptation Fund; Clean Technology Fund; Forest Carbon Partnership Facility; Forest Investment Programme; Global Environment Facility; Least Developed Countries Fund; Pilot Programme for Climate Resilience; Scaling-up Renewable Energy Programme; Special Climate Change Fund

<sup>17</sup> Asian Development Bank (ADB), Agence Française de Développement (AFD), African Development Bank (AfDB), CAF Development Bank of Latin America, European Investment Bank (EIB), Inter-American Development Bank (IDB), Japan International Cooperation Agency (JICA), KfW Development Bank (KfW), and the World Bank (WB)





Table 4: Global climate finance by source in 2014																																					
Source	Amount of funding provided (2014)																																				
UNFCCC and multilateral funds	<p>US\$2.5 billion was channelled through the UNFCCC funds and multilateral climate funds on the basis of their financial reports.</p> <p>Barnard (2015) analysed all projects approved by a selection of large multilateral climate funds<sup>16</sup> from 2010 to 2014. Out of 700 projects, 47 have explicit urban objectives. Their combined value is US\$842 million or 11% of the total funding approved by the selected funds in the same period.</p>																																				
Multi- and bilateral development banks	<p>A survey by CCFLA (2015) comes to the conclusion that the surveyed development banks<sup>17</sup> distributed US\$ 54 billion of climate finance, equalling 26% of total commitments. 31% of this money was channelled into explicitly urban projects. Figure 6 shows the share and amount of urban climate investment per bank.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;"><b>Figure 6: Share of climate finance directed to urban projects (in US\$ millions, 2014)</b></p> <table border="1" style="margin: 10px auto;"> <caption>Data for Figure 6: Share of climate finance directed to urban projects (in US\$ millions, 2014)</caption> <thead> <tr> <th>Bank</th> <th>Total Climate Finance (US\$ millions)</th> <th>Urban Climate Finance (US\$ millions)</th> <th>Urban Climate Finance as % of Total</th> </tr> </thead> <tbody> <tr> <td>UNFCCC and multilateral funds</td> <td>1,916</td> <td>0</td> <td>3,7%</td> </tr> <tr> <td>IDB</td> <td>2,461</td> <td>~300</td> <td>33,9%</td> </tr> <tr> <td>CAF</td> <td>2,810</td> <td>~400</td> <td>28,2%</td> </tr> <tr> <td>ADB</td> <td>2,856</td> <td>~100</td> <td>6,4%</td> </tr> <tr> <td>afc</td> <td>3,720</td> <td>~1,800</td> <td>50,6%</td> </tr> <tr> <td>KfW</td> <td>5,912</td> <td>~2,500</td> <td>57,3%</td> </tr> <tr> <td>The World Bank</td> <td>8,839</td> <td>~2,500</td> <td>28,0%</td> </tr> <tr> <td>European Investment Bank</td> <td>25,374</td> <td>~8,000</td> <td>27,0%</td> </tr> </tbody> </table> </div> <p>Source: CCFLA 2015</p> <p><sup>1)</sup> Other currency amounts converted to US\$ using average annual exchange rates for 2014.  <sup>2)</sup> ADB and WB include as "urban" only projects taking place within the geographic boundaries of urban areas.</p>	Bank	Total Climate Finance (US\$ millions)	Urban Climate Finance (US\$ millions)	Urban Climate Finance as % of Total	UNFCCC and multilateral funds	1,916	0	3,7%	IDB	2,461	~300	33,9%	CAF	2,810	~400	28,2%	ADB	2,856	~100	6,4%	afc	3,720	~1,800	50,6%	KfW	5,912	~2,500	57,3%	The World Bank	8,839	~2,500	28,0%	European Investment Bank	25,374	~8,000	27,0%
Bank	Total Climate Finance (US\$ millions)	Urban Climate Finance (US\$ millions)	Urban Climate Finance as % of Total																																		
UNFCCC and multilateral funds	1,916	0	3,7%																																		
IDB	2,461	~300	33,9%																																		
CAF	2,810	~400	28,2%																																		
ADB	2,856	~100	6,4%																																		
afc	3,720	~1,800	50,6%																																		
KfW	5,912	~2,500	57,3%																																		
The World Bank	8,839	~2,500	28,0%																																		
European Investment Bank	25,374	~8,000	27,0%																																		
Multilateral development banks	Climate finance provided by multilateral development banks (MDBs) to developing countries from their own resources was reported as US\$25.7 billion. An additional US\$16.6 billion was delivered by developed countries.																																				
Bilateral finance	Total bilateral funding was estimated at US\$17 billion (Buchner et al. 2015).																																				
National public finance	Comprehensive data on domestic climate expenditures are not available. However, estimates of climate-related finance through national budgets, national development banks and developing country's national climate funds suggest flows of US\$192 billion per year in developed and developing countries. In the limited number of developing countries for which information on domestic public climate finance is available, the data suggest that, in these countries, domestic public finance significantly exceeds the inflows of bilateral and multilateral climate finance.																																				
Private finance	Private investment in renewable energy and energy efficiency represents the largest share of the global total. Renewable energy finance by developed-country companies in developing countries is estimated at US\$ 2.1 billion. Foreign direct investment in greenfield alternative and renewable energy in developing countries was estimated at US\$21.6 billion (UNFCCC Standing Committee of Finance 2016).																																				
Own-source revenues	No estimates on the amount of municipal revenues spent on climate projects are available.																																				

## 3. Trends, challenges and opportunities

### 3.1 Trends in international urban climate finance

Urban climate action has been recognised as key for achieving sustainable development. Urban climate finance was discussed at recent international conferences with the following outcomes:

- **Financing for Development:** The Addis Ababa Action Agenda (AAAA), outcome of the Third International Conference on Financing for Development (FFD), promotes more financial autonomy and integrated urban planning at the local level as key to sustainable development. With public budgets and official development aid severely restricted, the AAAA clearly highlights the need to mobilise domestic financial resources and private investors. Important mechanisms for tapping domestic (or endogenous) finance flows include land-value sharing and tax reform and collection. The private sector will have to participate through blended-finance.
- **Sustainable Development Goals:** While the eight Millennium Development Goals did not specifically refer to cities, the Sustainable Development Goals (SDGs) recognise that cities play an important role in achieving sustainable development. SDG 11 highlights the need to “make cities inclusive, safe, resilient and sustainable”. However, funding commitments by international donors are not particularly earmarked for any of the SDGs; the amount of funding for each SDG is unknown.
- **COP21:** At COP21, more than 400 mayors gathered for the Climate Summit for Local Leaders. Overall, COP21 was an important forum to highlight the role of cities in the global fight against climate change. Acknowledging this, the UN Secretary

General Ban Ki-Moon announced that cities will be more involved in future negotiations. Yet, climate finance for cities was not specifically addressed at the event. The Paris Agreement, outcome document of COP21, recognises the importance of adequate and predictable financial resources for both adaptation and mitigation but does not specifically refer to funding for cities.

- **Habitat-III:** The United Nations Conference on Housing and Sustainable Urban Development (Habitat III) took place in Ecuador in October 2016. The signatories of its outcome document, the New Urban Agenda (NUA), commit to “supporting effective, innovative and sustainable financing frameworks and instruments enabling strengthened municipal finance and local fiscal systems” (UN HABITAT 2016). The NUA acknowledges that context-sensitive financial approaches, embedded in coherent policy frameworks and fiscal decentralisation processes and accompanied by capacity building, are crucial elements of sustainable urban development. It supports the deployment of a wide range of financial instruments from public to private and from local to global. Financing for affordable housing and public transport is particularly highlighted.

These outcomes show that, even though international climate finance flows are set to increase, it will also be crucial to catalyse domestic financial resources and private investments. With the NUA, the importance of municipal finance was embedded in the international development agenda.



## 3.2 Challenges for urban climate finance

### 3.2.1 Observed challenges at the local level

From the literature and the three country case studies we can summarise five broad problems that are in the way of urban climate finance.

- **C1: Lack of strategic planning for climate change:** Many cities, above all the smaller and less economically active ones, do not have comprehensive approaches to tackling climate change. Without an overall climate strategy and climate-aligned sectoral plans, it is highly difficult for them to identify appropriate climate projects and develop coherent climate finance plans.
- **C2: Lack of project pipeline:** Even if funding is available, cities are often unable to present promising projects. Issues relate to the identification of climate-compatible and economically attractive projects as well as development of sound technical and financial project proposals.
- **C3: Lack and inefficient use of local revenues.** Many local governments have weaknesses in financial management and do not use funds efficiently. This reduces the availability of own-source revenues for climate projects. Even if used efficiently, local revenues are usually too low to cover large investments, such as into sustainable infrastructure.
- **C4: Low creditworthiness of cities:** Only a small percentage of the 500 largest cities in developing countries are deemed creditworthy – about 4% in international financial markets and 20% in local markets (World Bank 2013). This is mainly due to the weak revenue bases that often characterise municipal budgets and to the limited financial infrastructure and capacity of cities. As a result, it is often difficult for cities to borrow money from private financial institutions.
- **C5: Limited access to international climate finance:** Local governments are often unable to access multi- and bilateral (climate) funding. Accreditation is usually reserved for higher-level authorities. Projects have to be aligned with the priorities of these accredited entities as well as national strategic

objectives. This can make it hard for cities to develop projects that reflect their local needs and circumstances. Moreover, funded projects have to comply with strict eligibility criteria.

The observed problems are caused by a set of underlying factors. The internal factors (within local governments) and external factors (outside of local governments' sphere of influence) described in chapter 3.2.2 and 3.2.3 have been identified as basic challenges for many cities.

Yet, such barriers vary between the different types of urban areas. For example, metropolitan areas often have greater fiscal capacity than smaller municipalities as they benefit from more economic activity and qualified personnel. At the same time, expenditures per capita can be lower in high-density metropolitan areas and municipalities because infrastructure is more compact (UN-HABITAT 2009). More information on the challenges for small urban areas can be found, for example, in (Fox 2014). These challenges will not be discussed in this study since as all three case study cities are large, well-connected municipalities/metropolitan areas with strong economic activity.

Many of the challenges identified in this chapter are even more prominent for adaptation than for mitigation. This is due to the fact that adaptation is broader and more complex than mitigation and that its benefits are even more difficult to measure.

### 3.2.2 Underlying internal issues

#### 3 internal factors

Awareness, capacity, institutional structures

#### Lack of awareness and political commitment

Many cities around the world have realised and taken on their role in climate change mitigation and adaptation. This becomes evident, for example, in the fast growth of several cities networks such as the C40 Cities Climate Leadership Group (See Annex III for more city networks). Yet, awareness of the risks and opportunities

of climate change is still relatively low in most municipal administrations.

At the same time, other development challenges are often more pressing in the short-term. People tend to underestimate the potential co-benefits of climate smart development (e.g. cost savings, contribution to poverty reduction and health) because they are very long term – well beyond the next election – and difficult to measure or quantify. It is difficult to convince taxpayers and politicians to invest today for seemingly uncertain future gains (World Bank 2013). Thus, climate protection and adaptation are delayed until more immediately relevant.

Climate change responses and climate finance can also suffer from lack of personal motivation. Familiarising oneself with this complex and unprecedented topic is cumbersome and does not usually generate direct benefits for the individual. Municipal officers can also be biased against climate activity if personal contacts are involved in polluting industries.

Another challenge that affects willingness to deal with climate change and related climate finance is linked to the status of responsible administrative personnel. If people are not permanently employed and expect to switch to other departments or jobs in the near future they might be less motivated to delve into a complex topic. Moreover, their sense of responsibility might be lower than that of staff members who are able to conduct a climate project from beginning to end.

Finally, responsible municipal staff is often not aware of the different opportunities for funding urban climate-compatible development. Particularly international climate funds are often not very visible at the local level. Best practices in urban climate finance need to be shared more widely.

### Lack of institutional structures, processes and capacity

The capacity of municipalities to attract and manage urban climate finance is based on two pillars, namely sound municipal financial management (and governance) and thorough understanding of climate change. Yet, even if the basic preconditions are fulfilled, climate finance still comes with specific challenges. Table 5 describes some of the key structures, processes and capacities (see page 39).

These capacity issues are not limited to municipal administrations but often also apply to local financial institutions and investors. Such institutions have limited experience with financing municipal projects and lack expertise in dealing with the uncertainties of climate change (Godfrey and Zhao 2016).

Finally, even if municipal officials or financial institutions have the required skills to manage all aspects of climate finance, they often lack the time to do so.

## 3.2.3 Underlying external issues

### 4 external factors

Regulation, project profiles, investment environment, funding requirements

### Detrimental legal and regulatory framework conditions

National legal and regulatory frameworks may not be conducive to climate smart development or even discourage it. This affects municipalities' willingness to deal with climate change and to develop expertise in climate finance. Detrimental financial and fiscal regulations may also restrict local governments' options for making the best use of available revenues and attracting additional sources of funding.

- **Uncertainty over national policies:** Cities often have uncertainty over policies, including policies that affect low emission, climate-resilient infrastructure. For example, national governments often leave it open as to when subsidies or tax incentives for carbon intensive industries will be withdrawn. Incentives for climate smart investments, in turn, can be easily withdrawn in case of economic downturns or regime changes. These uncertainties make it difficult for local governments to plan ahead and to demonstrate the real economic benefits of climate projects.



Table 5: Processes, structures and capacities for urban (climate) finance	
<b>Sound municipal financial management and governance:</b> If municipalities have issues with finance and/or governance, they will not be able to obtain enough funding to fulfil their basic tasks.	
<b>Revenue collection</b>	Municipalities need to have the necessary data and mechanisms to fully collect revenues and to sanction non-payment.
<b>Budgeting, accounting and reporting</b>	Municipalities should do long-term strategic and short-term operational planning of financial resources. All financial activities need to be accounted for and reported in a transparent manner to enhance credibility amongst citizens and investors. Data on municipal finance should be collected on a comparable basis.
<b>Credit rating</b>	Municipalities can improve their attractiveness to potential lenders by obtaining a credit rating, either in international financial markets or in local markets.
<b>Project preparation and marketing</b>	Where projects are to be externally financed, authorities have to be able to project costs and revenues, financially structure projects, prepare and promote attractive project proposals, negotiate effective contracts, etc.
<b>Municipal governance</b>	Finance and governance are closely linked. For example, it is difficult to pay for services and coordinate service delivery when there are many municipalities in a region or metropolitan area. Transparency and accountability, cooperation as well as community participation are also crucial basics for effective finance.
<b>Climate-smart development:</b> If climate change is not a priority and municipal staff lack climate-related skills, municipalities will not get to the point where they start thinking about climate finance.	
<b>Climate data and modelling</b>	Mitigation actions have to be evaluated in their potential to reduce GHG emissions. GHG inventories should thus be complete, consistent and reported in a transparent way. Moreover, municipalities require both information on past changes in climate variables and modelling skills in order to project future expected trends and impacts.
<b>Long-term planning</b>	Planning is often linked to legislative periods, hence hampering the development of long-term urban development and capital investment plans. Under such circumstances, it is difficult to account for the impacts of climate change and to illustrate the benefits of mitigation and adaptation (UNEP 2014).
<b>Climate mandate</b>	Climate co-benefits are often generated through investments made by the energy, transport and health sectors or other departments. Hence, these sectoral departments need to have the mandate mainstreaming climate change.
<b>Urban climate finance:</b> Finally, urban climate finance requires additional structures and capacities that are not usually necessary for business-as-usual urban development.	
<b>Cost revenue projections</b>	Municipalities need to project the costs and revenues of climate project as accurately as possible in order to develop sound financial proposals. This requires data and skills for quantifying economic benefits (such as energy savings, emission reductions, increased productivity due to affordable mass urban transit systems, etc.) or accounting for non-economic benefits.
<b>Investment criteria</b>	Projects have to fulfil the context-related requirements of the funding sources. For example, the GCF assesses project proposals according to their potential to contribute to 1) the Fund's objectives, 2) a general paradigm change in local development and finance, 3) sustainable development, etc. (Green Climate Fund 2015a).
<b>Coordination</b>	Project preparation usually requires coordination with the implementing entities of international funds and climate programmes. As described before, these are often international financial institutions but can also be regional or national entities.
<b>Monitoring, reporting and verification</b>	International financial institutions often make it mandatory to monitor, report and verify the real impacts of climate projects. In case of result-based finance, funding is even disbursed only upon achievement of certain pre-determined results. In addition, particularly private lenders and investors might require even more thorough monitoring of revenues in order to reduce risk of default.

- **Uncertainty over intergovernmental transfers:** Another challenge with which local governments can be faced is the irregularity and uncertainty of revenue streams. Intergovernmental transfers do not necessarily reach cities at regular intervals or amounts. This negatively affects local governments' capacity to repay any loans, hence reducing their creditworthiness.
  - **Regulations reducing local fiscal and financial autonomy:** Cities often have little or no control over the tax rates they can levy, thus severely limiting their possibility to generate additional revenues from undesired behaviour. Regulation may also limit municipal borrowing, for example by establishing borrowing ceilings. Access to debt from multi- and bilateral financial institutions often requires loan guarantees from national governments. Yet, not many governments in developing countries provide such guarantees (UN-HABITAT 2009).
  - **Lack of adequate investment frameworks:** National governments should make sure that investment frameworks are in place that support municipalities' climate finance ambitions. This would, for example, include clear policies or defined standards for sustainable infrastructure projects or mandatory obligations to disclose the climate performance of projects. The lack of such frameworks makes it more difficult for authorities to develop bankable projects and for investors to assess the performance of such projects (Godfrey and Zhao 2016).
- measures do not produce stable revenues (such as is often the case for adaptation measure), repayment depends on the degree to which these measures increase a municipalities' profitability and, consequently, its capacity to generate additional revenues. More often, non-revenue generating measures have to be funded from the general budget. This binds resources that might be needed for other expenses, thereby reducing politicians' willingness to invest in such measures.
- **Technology and policy-related risks:** Investors and financial intermediaries often see further risks. Many low-carbon climate-resilient technologies are new and (relatively) unproven, thus making it hard to assess their feasibility and economic potential. Uncertainty related to future regulatory policies can further increase the risk of climate projects, particularly for projects in sectors that are subject to a range of energy or climate policies.
  - **Scope of projects:** Economically attractive projects are often too small or too different from each other to be relevant for large private investors. Bonds generally have to have a volume of several (hundred) million US\$ in order to have adequate transaction costs. Fixed costs for banks are too high to serve local governments (Kamiya 2016).

### (Perceived) Unfavourable economic and risk profile of climate projects

Economic viability and risk are factors that affect both the developers and financiers of climate projects. Municipalities with scarce economic resources are required to find the most cost-efficient solutions so that basic service delivery is not negatively affected. Private investors will only make investments if they can expect appropriate and reliable returns.

- **Economic risk:** Many sustainable urban infrastructure projects require large initial investments (e.g. flood dams) and amortise only after years or decades. This increases the risk of default and reduces the attractiveness of such projects to investors and city officials alike (World Bank 2013). If climate

### Other factors influencing creditworthiness of local governments

Investors often have concerns not only about the economic profile of climate projects but also about the general creditworthiness of local governments. As was mentioned before, local revenue is generally too low to guarantee stable repayment. Additionally, local administrative staff often lacks the required skills and capacity to develop viable projects and to make sure that debt is repaid in time. Yet, the following factors affect creditworthiness as well:

- Lack of transparency makes it hard to track whether the borrowed money is used for the agreed purposes, hence hampering adequate risk management and results-based finance. Opaqueness is also conducive for corruption and financial mismanagement.





- Unpredictable regulatory changes, demographic shifts, macroeconomic cycles and economic restructuring affect the availability of intergovernmental transfers and local capital. Such issues oftentimes require local governments to spend their revenues on activities other than debt repayment. Non-payment of taxes and fees causes local revenues to be volatile.
- Moreover, local political conditions can be instable. In case of regime changes, the new government might no longer intend to repay the debt taken up by previous governments. Political instability may also reduce economic activity and revenue collection, thus causing volatile revenue streams.

### Lack or inadequacy of international funds and financial mechanisms

International and bilateral funds and banks are often willing to take on higher risks than private lenders as it is their mandate to facilitate local development through targeted funding. However, several challenges make it difficult for local governments to obtain funding from such sources.

- **Lack of direct access to international climate finance:** Internal policies confine the majority of climate funds and development banks to cooperating with national governments or international organisations only. Funding proposals can only be submitted by Accredited Entities (AE) or National Implementing Entities (NIEs) and have to be channelled through National Designated Authorities (NDAs) or National Focal Points. Cooperation with these organisations can be difficult for cities as both sides often lack resources for coordinated project planning.
- **Disincentives for accreditation:** Local (urban) institutions that wish to accredit with international funds themselves will find it difficult to do so. Accreditation is usually reserved for international organisations and national governments. The Adaptation Fund (AF) and GCF make notable exceptions as they allow sub-national entities to become accredited through their “direct access track”. Yet, accreditation to climate funds is difficult and time-consuming (see Annex II on the requirements for GCF accreditation) and will thus not be feasible for the majority of local institutions.
- **Challenging project eligibility criteria:** Many climate funds and development banks reserve climate finance for “additional projects” (that would not be necessary without man-made climate change) and “incremental costs” of climate-compatible development. These aspects are difficult to demonstrate. Moreover, eligibility for international climate finance usually requires a strong record of fiduciary standards, social and environmental safeguards and creditworthiness that many cities cannot comply with (Junghans and Dorsch 2015). Funds and banks frequently require specific monitoring, reporting and verifying (MRV) in order to demonstrate real impacts. MRV conditions are not standardised, thus placing great pressure on local governments to comply with different MRV practices (Technical Assistance Unit & Western Cape Government 2013). Overall, the application process to climate funds often takes a long time and requires considerable expertise and capacity.
- **Inappropriate spending conditions:** International climate finance is more difficult to obtain for adaptation than for mitigation. Moreover, threshold amounts for investments might be too high for municipalities. Another challenge is that international funds often have to be requested and spent too quickly to allow for comprehensive planning and careful implementation. Further, many development banks are unwilling or unable to provide loans in local currency, hence reducing the relevance of such funding for local authorities (Kamiya 2016).

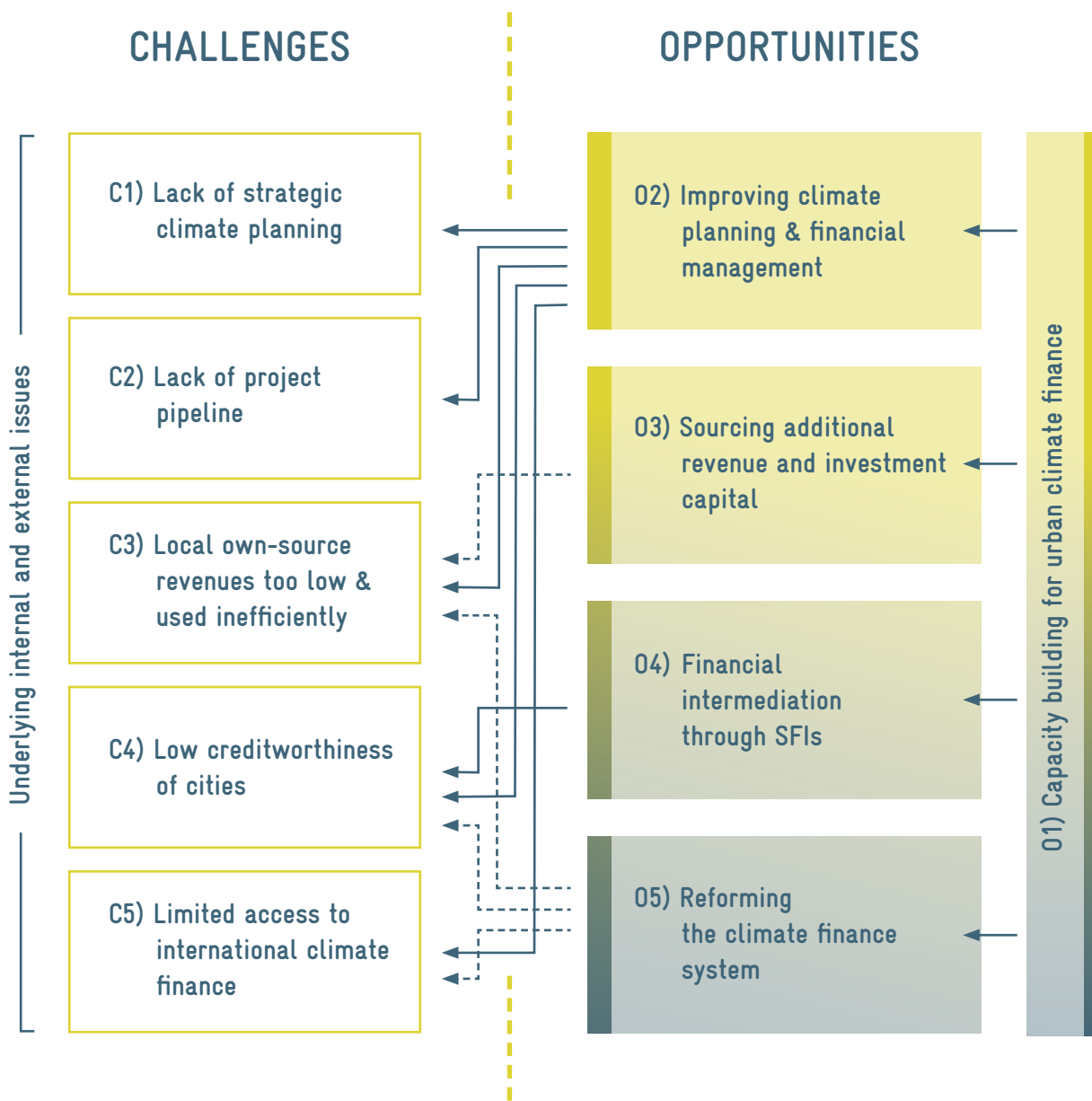
Private finance also comes with many challenges. Private investors and local financial institutions oftentimes lack capacity to assess climate-related investments, thus restricting their funding activities to traditional fossil fuel based industries. Available financial instruments, such as loans and bonds, tend to be too short for the lifecycle of infrastructure projects.

### 3.3 Opportunities and good practice examples

In the following chapters, we describe measures that help to create the necessary conditions to achieve both better management of existing funds and easier access to additional sources of funding. Figure 7 shows how these measures are linked to the identified challenges.

- **01: Capacity building** is the basic foundation for making sure that local governments and other stakeholders understand the challenges and opportunities for urban climate finance. Information exchange and discussion will enable governments to learn

Figure 7: Opportunities for reducing urban climate finance challenges



Source: adelphi

LEGEND:

Measures led mainly by local governments

Measures led mainly by (inter-)national entities



from the successes and mistakes of climate finance front-runners (some of which are included as case studies in the following chapters).

- **02: Improving climate planning and financial management** involves that cities create the basic institutional structures and strategies for climate-smart planning and finance (C1). It improves local capacity for identification of effective and viable projects (C2) and for management of local own-source revenues (C3). Moreover, investments into better planning and management will reduce the risks for private lenders, thus incentivising them to become more involved in urban climate projects (C4). Finally, it will enable local governments to take into account and comply with (some of) the requirements of international financial institutions (C5), such as mandatory environmental safeguards.
- **03: Sourcing additional revenue and investment capital** involves that cities use “new” financing instruments, such as land value capture and bonds. Different instruments are available for increasing own-source revenues and tapping additional investment capital from the private sector (C3).
- **04: Financial intermediation through specialised financial institutions** can serve to pool risks, facilitate match-making with investors or guide international funds directly to sustainable urban development. This makes local climate investments more attractive for private and public investors and more economically viable for cities (C4).
- **05: Reforms of the climate finance system** help to create the required framework conditions for local governments to proactively engage in climate projects and obtain the required funding. Policy changes can have positive effects on the use and availability of local own-source revenues (C3), private intermediaries and investors (C4) or public funds (C5).

These opportunities will be described in more detail in the next chapters.

### 3.3.1 Capacity building for urban climate finance

Climate change is perceived by many as a distant and low order threat. Especially decision makers (but also their staff) must become aware of the effects of climate change on their cities. They have to understand why and how climate-smart planning contributes to – rather than constrains – sustainable social, economic and environmental development (Parramon-Gurney and Gilder 2012). Hence, awareness raising is the first step to create demand for more targeted urban climate action.

Planning and managing climate projects requires technical and managerial skills that often exceed the capacities of administrative staff. Capacity building is thus one of the most important measures for reducing the perceived burden of climate protection and adaptation. Training for urban climate finance will have to focus on both basic climate- and finance-related skills as well as the on the particularities of climate finance itself.

- **Capacity for strategic climate planning:** Responsible officers need to have a good understanding of climate change in general and in the context of their specific sectors. Hence, capacity building for strategic climate planning should first provide participants with the required basic climate change information (for instance on expected climate trends in the respective city) and skills (e.g. climate risk assessment). Then, participants should be trained on climate planning and mainstreaming techniques, such as multi-criteria-analysis, life-cycle assessment, etc.
- **Capacity for sound financial management:** Climate finance requires that planners and project implementers have sound financial management skills so that they can develop bankable projects and plan adequate budgets. Where this is not the case, training should be provided on accounting principles and capital investment plans. Later, technical knowledge of more complex financial instruments such as bonds, credit ratings, loans and others should be refined (Kamiya 2016).
- **Capacity for public climate finance:** Funding climate projects can be more complex than investments into traditional sectors. This is due to the specific requirements attached to the different types of climate funding.

Capacity can be built in various ways. Responsible administrative staff members can receive targeted training through in-service training, online courses or webinars. If possible, selected climate champions<sup>18</sup> can participate in dedicated climate (finance) programmes organised by universities, NGOs, development cooperation agencies or other providers. Such champions can raise awareness and promote capacity building among other stakeholder groups (Roberts and O'Donoghue 2013).

However, capacity building should not be restricted to staff of the local climate change focal point (e.g. the ministry of environment's climate department). The ministries of finance and planning as well as relevant line ministries or departments also have to make sure that their staff is able to mainstream climate change into planning and implementation of their respective activities. Additionally, financial institutions and investors should also be encouraged to invest into capacity building of their own staff in order to increase internal expertise and experience with municipal climate projects.

Higher levels of government as well as bi- and multi-lateral institutions can contribute to capacity building by helping local governments assess capacity building needs, subsidising training costs, establishing dedicated trainings programmes, etc. They should provide cities with legal, technical and financial assistance to support capacity development. On the ground support, e.g. for project development and climate change mainstreaming, can also help building local capacities (CCFLA 2015).

Local and city governments can join a large variety of networks and contact different organisations to ask for capacity building and technical assistance. Case study 1 provides insights into how the City Creditworthiness Initiative helps cities in building local capacities for sound financial management. Annex I lists funds and development banks that are involved in urban climate finance and that also offer technical assistance and capacity building. Annex III presents an overview of initiatives that provide capacity building support and foster partnerships to facilitate urban climate action.

<sup>18</sup> Climate champions are administrative and/or political stakeholders who promote and advance climate action in their cities.

## Box 1: City Creditworthiness Initiative

**Short summary:** Launched in 2013, the World Bank's City Creditworthiness Initiative helps cities in developing countries improve their financial performance and secure private investments.

**Detailed description:** The initiative has two elements: a capacity building scheme, called City Creditworthiness Academies (CCA) and a technical assistance scheme called City Creditworthiness Implementation Programs (CCIP) (World Bank 2016).

- The CCA offers hands-on learning programmes on creditworthiness and municipal finance for city leaders. Through a self-assessment tool (available at [www.citycred.org](http://www.citycred.org)) participants develop a customised preliminary action plan in order to strengthen the creditworthiness of their city.
- Once an action plan is developed at the CCA, the CCIPs are launched in order to implement the action plan. CCIP comprises in-depth, multi-year, on the job, customised technical assistance programmes for city government leaders. These programmes seek to help city governments prepare for, structure and close market-based financing transactions for climate-smart infrastructure projects.

CCA is designed to last one year, while CCIP can last up to 4 years. So far, 261 local authorities in 30 countries have participated in the City Creditworthiness Initiative, mostly through the academies. The goal is to reach 300 cities in 60 low- and middle-income countries (World Bank 2016).

**Success factors:** Through shared learning and hands-on training directly relevant to the local level, the City Creditworthiness Initiative enables city governments to significantly increase their capacity to finance climate-smart projects. Moreover, the multi-year nature of the initiative means that local governments are assisted as they achieve goals that build on each other such as improving municipal services, strengthening administrative fundamentals, improving their creditworthiness and gaining access to local financing.

**Challenges:** One of the challenges that the initiative faces is ensuring that city governments not only design an action plan through the CCA but that they continue with the implementation of the plan under the



CCIP. An important reason why the implementation of the plan might be affected by risks is a lack of continuity in public programmes and policies at the local level, for instance due to a change of government. This could lead to a delay or cancellation of the implementation of the action plan designed at the CCA. Finally, a third challenge concerns the capacity of local governments to retain the public officials trained through the CCA and CCIP. If the rotation of key local officials is high, there is a risk that the action plan may not be implemented and hence cities might not be able to increase their creditworthiness and improve their access to financing for climate-smart projects.

### 3.3.2 Improving climate planning and financial management

Cities have to improve their climate planning and financial management in order to ensure that available funds are used as efficiently as possible. The following steps are all part of enhancing a municipality's climate finance readiness.

#### Climate data collection, modelling and analysis

Cities need to gather a broad range of information to design effective climate projects, for example:

- **Greenhouse gas emissions:** One of the first steps towards ambitious climate change mitigation in cities is to collect raw data on greenhouse gas (GHG) emissions in order to develop city-specific GHG inventories. Such inventories serve as the basis for identifying the most GHG-intensive sectors and activities and developing respective mitigation strategies. They are also critical for measuring a city's climate performance over time and adapting mitigation strategies where necessary.
- **Climate and weather data:** Simultaneously, cities need to collate data on past changes in climate variables (e.g. rainfall patterns, changes in seasonal patterns and temperature distribution) and develop downscaled climate models predicting future weather events and climate conditions. With this information, cities can conduct vulnerability analyses, e.g. to determine the impact of climate variations

on socio-economic variables. Such assessments provide important input for cities to determine the costs of climate change and benefits of adaptation.

Climate-related information is required for justifying climate projects to those who are in charge of granting the required funding, e.g. municipal finance departments, private banks, (inter)national development banks and international funds. Highlighting the net present benefits of medium- and long-term investments will allow planners and funders to see past some of the short-term challenges of climate projects, such as high upfront investments. Moreover, comprehensive analysis is crucial for allocating scarce funding as efficiently as possible.

#### Climate strategies, action plans and investment plans

Once a city has determined its contribution and vulnerability to climate change, it should develop strategies for tackling these challenges. Climate change should be addressed at several points:

- **Overall development plan of the city:** The overall development plan should refer to the city's climate change challenges and define basic principles, priority areas and flagship programmes for low-carbon, climate resilient development. Such plans serve as the overall guideline for a city's development and should therefore set the right incentives for sectoral strategies.
- **Sectoral strategies:** All climate-relevant sectors (energy, transport, health, education, etc.) should make sure that their strategies are climate-proofed, i.e. that they do not unnecessarily incentivise GHG intensive development and measures increasing a city's vulnerability.
- **Urban planning:** Urban land-use planning should also take climate change risks into consideration and create opportunities for resilient urban development. For example, new green spaces can be designed to function as natural CO<sub>2</sub> and heat sinks.
- **Dedicated climate change strategies:** Finally, the local climate focal point(s) should develop dedicated climate change strategies for mitigation and adaptation. These plans should specify greenhouse gas reduction targets and, if feasible, concrete adaptation targets.



These strategies need to be translated in to clear action and investment plans to allow for effective implementation and to provide security to all stakeholders who are planning to invest into low-carbon, resilient urban projects. Coordinating the climate action and investment plans between different levels of government and different sectors is crucial for avoiding wasteful spending. All plans should be made publicly available to attract the attention of private investors and public financial institutions.

### Developing and marketing fundable climate projects

Climate-proofed strategies then need to be translated into economically feasible and – in the case that they are to be funded through (development) bank loans – “bankable” projects.

- **Project conceptualisation:** Project planners should make sure that new projects in critical urban sectors are as emissions extensive as possible and contribute to making the city and its citizens more resilient. All projects should be assessed by their costs and benefits in order to make sure that the projects with greatest net economic, social, environmental and climate-related benefits are chosen. Considering solutions that are low-carbon but not dependent on new technology can reduce project risks and, hence, make it easier to obtain external funding. A list of planned projects should be published to indicate investment opportunities for private investors.
- **Developing bankable project proposals:** In the next step, project designers need to screen the available funding sources and analyse their requirements. An inventory of local, national, regional and international climate funds could be developed for the entire city and enriched with sector-specific information in order to make the search for funding more efficient. Responsible departments then select the most appropriate funding source for their projects and develop detailed technical and financial proposals in line with the requirements of the selected financial vehicles. Uniform project investment templates should be developed to speed up proposal writing and to make sure that all key aspects are covered in the proposals (C40 Cities Climate Leadership Group 2016).

### Monitoring and evaluation

Successfully funded climate projects need to be monitored for several aspects:

- **Contribution to mitigation and/or adaptation:** Monitoring and evaluation of the real impacts and implementation success of climate projects is often a prerequisite for funding from donor financial institutions. This is particularly true if a results-based approach is applied where funding is only disbursed once the expected positive results have been achieved. Private lenders may also require such information for their risk management.
- **Financial performance of projects:** Additionally, climate projects need to be monitored in regard to their financial performance. It is important to track whether the expected revenues or profitability increases can be generated in order to quickly adapt the budget or restructure the repayment schedule in case of underperformance.
- **Overall climate finance:** Additionally, it can be helpful to track climate-related investments. This information helps governments identify funding gaps and communicate them to higher-level authorities. Tracking of climate finance requires a clear definition of climate finance, including specifications on how to deal with climate-aligned budgets that are not categorised as such.

The results of such monitoring and evaluation should be reported regularly and used to update climate strategies as well as budgets and implementation plans.

### General public financial management

The success of climate finance also depends on the quality of general public financial management. Investing into better financial management will reduce wasteful expenditure, improve revenue collection and contribute to propelling a city’s creditworthiness. A comparison of over 100 studies on urban finance by Nixon et al. (2015) shows that “strengthening fundamentals is important: improving the intergovernmental environment, coherent decentralisation, improving the administration of core revenues such as property taxes”.

Specific opportunities for improving financial management include, for example, widening and more strictly





implementing sanctions for non-payment of taxes and fees; simplifying administrative approaches (e.g. for property tax collection); introducing best practices for financial management processes; and introducing information and communication technology to support financial management. Moreover, it is crucial that cities collect data on a comparable basis on municipal finances. These measures will not be discussed in more detail as this would go beyond the scope of this study.

### 3.3.3 Sourcing additional revenue and investment capital

Traditional sources of municipal financing from local revenues, higher-level governments and specialised financial institutions will not be sufficient to close the funding gap for sustainable urban development. Cities need to establish additional revenue-generating mechanisms and attract investment capital. The following instruments are already being used by several cities around the world, particularly in more advanced economies. However, for most cities such instruments are “new” and can thus serve to source additional revenue and investment capital.

It needs to be noted that all of these options will be difficult to implement for cities that do not have a good tax system in place, good budgeting procedures, transparency and accountability for decision-making, etc. These issues have to be tackled parallelly.

#### Additional own-source revenues

On the one hand, the instruments described in this section – land-value capturing and pricing of negative externalities – allow governments to generate revenues. On the other hand, they can serve as (dis)incentives for certain behaviour and urban development patterns. Such steering functions also apply to other municipal funding mechanisms not described here. For example, a development charge for infrastructure that charges different amounts depending on how close the development is to existing services will more likely lead to compact growth than a development charge that charges all developments the same amount regardless of where they are located. Yet, it should also be noted that the pressure on the growth of many cities is so strong that such incentives might not be sufficient to prevent urban sprawl.

#### • Land-value capturing

Public regulation, planning or investment can increase the value of land. For example, improving road infrastructure will increase the price of land in suburbs. “Up-zoning” an area for more intense development will increase the demand for such areas, thereby also increasing its value. Land-value capturing allows the public sector to financially participate in such a value increase (Kamiya 2016). Cities wanting to benefit from land-value increases can, for instance, raise taxes for nearby land or properties, levy betterment fees or sell special building rights.

Land value capturing requires local governments to have strong institutional capacity. Besides the capacity to collect taxes and manage projects, local governments also need to conduct detailed assessment with good data, and clearly communicate the potential economic and environmental benefits of any infrastructure project to property owners (Godfrey and Zhao 2016).

For land value capture to work, a good property tax system is needed, i.e. one where there is a good property assessment system to value properties.

#### Box 2: Land-value capturing in São Paulo

**Short summary:** The government of Sao Paulo issues special bonds (Certificates of Additional Potential Construction (CEPACs)) that allow investors to construct larger buildings in certain areas than it is usually allowed. The proceeds of the bonds are re-invested into the same area.

**Detailed description:** In Brazil, land ownership rights are separate from building rights. Local governments regulate and sell both kinds of rights, thereby ensuring that property is developed in line with social interests. Generally, private landowners are entitled to construct buildings in line with a basic floor area ratio (FAR)<sup>19</sup> that is below the maximum FAR that the area could support. São Paulo’s current master plan (2014) determines a basic FAR of 1 for the entire city.

In 2002, the city of São Paulo introduced a system that allows landowners to build above the FAR in exchange

<sup>19</sup> FAR = (total amount of usable floor area of the building)/ (area of the plot)

for financial contributions to sustainable urban development. Under this system, the city identifies areas for redevelopment (called Urban Operations (UOs)) and auctions a certain number of tradable Certificates of Additional Potential Construction Bonds (CEPACs) that entitle the investors to build higher or to change the use of their land. The amount of CEPACs to be issued corresponds to the additional square meters that the designated UO can support. The minimum price for a CEPAC is determined by calculating the value difference between the land with and without additional building rights. The auctions are conducted by the Bank of Brazil and are supervised by the national Securities and Exchange Authority. One of the most well-known UOs in São Paulo is Água Espraiada. As of February 2013, 2.39 million CEPACs for this area had been sold, generating net revenues of US\$ 1,181 million for the city (Suzuki et al. 2015).

**Success factors:** Whether and how successfully municipalities can capture the value of urban spatial development depends on the overarching policy framework. Brazil's Statute of the City, 2001, establishes several mechanisms for ensuring the social function of property (e.g. separate property and building rights, progressive taxation on vacant land, etc.), thus laying a stable the foundations for local governments to benefit from land value increases. In Sao Paulo, demand for CEPACs and financial gains from their sale was raised by incrementally reducing basic FAR (Smolka 2013).

**Challenges:** CEPACs limit development to the designated UOs and render other areas unattractive for developers. Critics also argue that CEPACs can lead to wasteful spending because all of the proceeds of the auctions have to be spent in the area to which the additional building rights apply. This has so far also prevented the city from investing into public transport connecting different districts. To deal with these challenges, São Paulo's city council currently considers allowing part of the CEPAC proceeds to be spent in neighbouring areas. Another challenge is that developers buying CEPACs generally focus on high-end properties that are expected to generate greater return than social housing. This results in a limited supply of affordable housing in the UOs (Suzuki et al. 2015).

- **Pricing of negative externalities**

A congestions charge is levied on driving motor vehicles within certain areas at certain times. Such charges often have two purposes, namely reducing urban traffic and generating revenues for the municipality (GIZ and ADB 2015). The London Congestion Charge is a well-known and successful example. Drivers have to pay £11.50 (US\$ 14,35) per day from Monday to Friday for driving a vehicle within the charging zone between 07:00 and 18:00 (Transport for London 2017).

Road tolls and parking fees also allow municipalities to increase their revenues while at the same (dis)incentivising certain behaviour through the pricing of externalities. For all of these instruments to be effective, both in regard to revenue collection and reduction of negative externalities, municipalities have to have effective control and sanctioning mechanisms.

## New forms of private financing

- **Green municipal bonds**

Green municipal bonds are issued by municipal authorities to fund "green" projects, i.e. with benefits for the environment and/or climate. Since the emergence of the green bond market in 2008, US\$ 131 billion of capital has been raised. It is estimated that US\$ 2.3 billion (or 1.7%) of this funding flowed into urban infrastructure projects in emerging and developing countries (Low Carbon City Lab 2016).

Issuers of green bonds have traditionally been development banks (e.g. KfW, World Bank, IFC) but corporate and municipal issuers have become more actively involved as well. Currently, the majority of green bonds are issued in China, the USA and Europe. Yet, there is great potential for cities in developing and emerging economies to issue green bonds. 20% of such cities have the required creditworthiness to raise capital in the local financial market through green bonds. The other 80% of cities struggle with low creditworthiness and other challenges that increase the (perceived) risks of urban climate investments. These cities probably require external support to access local green bond markets (see next chapter for a discussion of de-risking and credit enhancement).



### Box 3: Green bond in Johannesburg

**Short summary:** Johannesburg issued a large green bond in 2014 to finance a wide range of green investments in the city, primarily mitigation.

**Detailed description:** In June 2014, the city of Johannesburg issued the first green bond in South Africa through the Johannesburg Stock Exchange (JSE). The bond was worth R1.46 billion (US\$ 136 million) and was priced at a competitive 185 basis points above the R2023 government bond. Due to great demand from investors, the bond was 150% oversubscribed. It “matures” by 2024, meaning that it has to be paid back ten years after its issuance. The coupon, or annual interest rate paid on the bond, is 10.18% (Environmental Finance 2014).

According to the city, the money raised through the green bond will be used to finance “green initiatives such as the Bio Gas to Energy Project and the Solar Geyser Initiative, as well as all other projects that reduce greenhouse emissions and contribute to a resilient and sustainable City” (City of Johannesburg 2014). Generally, Johannesburg focuses on promoting resource-efficiency and climate-resilience in the energy, transport, water, waste, housing and building sectors. Other green projects include, for example, retrofitting identified households with energy-saving light bulbs; recycling of waste; and promoting water conservation initiatives.

In 2015, the International Financial Corporation (IFC) issued its first domestic bond on the JSE. The bond, worth R1 billion (US\$ 71 million), targeted low-carbon projects by the private sector. Even though the proceeds of the bond are managed by the IFC rather than the municipality itself, this green bond listing demonstrates that the city and its major financial institutions are taking efforts to attract significant capital for funding and investment activities in green sectors (African Markets 2015).

**Success factors:** Johannesburg issued its first (non-green) municipal bond in 2004 and has since then continued its involvement in the bond market. The city was able to use its experience with bond issuances for preparing and launching the 2014 green bond. The green bond was promoted and supported by Johannesburg’s former executive mayor Parks Tau.

It is, as indicated, the first municipal green bond issuance in South Africa, providing useful learnings for other metros, such as Cape Town in developing a similar market.

**Challenges:** The initiative has been criticised for under developed project selection criteria and for an unbalanced focus on mitigation activities. Developing adaptation projects that are often a priority is cited as a challenge by other municipalities, such as Cape Town. Cape Town envisages the issuance of a green bond in June/July 2017. The main difference to the Johannesburg green bond is that it will be certified by the Climate Bonds initiative. This means that the entire process of issuing the green bond is according to the international standards set by this initiative. Furthermore, an external consultancy audits the process. Whereas the City of Johannesburg did not adhere to any standards and is not externally audited, projects that will be financed through the proceeds of the Cape Town green bond are earmarked and focus on climate change mitigation and adaptation, such as water conservation and the purchase of electric buses.

#### • Crowdfunding

Crowdfunding is an approach whereby a large group of (mostly private) investors provide small amounts of capital for individual projects through online platforms. Crowdfunding can be debt-based, meaning that borrowers have to pay fixed interest rates on the borrowed money and repay the entire amount over a pre-determined time frame. Debt-based crowdfunding can serve to fund revenue-generating projects, such as the installation of renewable energy plants. Donation-based crowdfunding also exists for certain kinds of projects, e.g. with particular societal benefits.

Overall, crowdfunding is suitable only for funding small initiatives that are clearly in the interest of citizens (Junghans and Dorsch 2015). For example, the city of Ghent (Belgium) has created a crowdfunding platform to realise climate change adaptation through urban greening. Citizens donate a minimum of €5 to their favourite projects; the projects with most community support can then apply for a municipal subsidy. In its first year, the crowdfunding platform has generated total revenues of €70.000 (Climate-ADAPT 2016).

## Other mechanisms

- **On-bill financing**

On-bill financing can be used to increase funding for energy efficiency retrofits of buildings. Under this approach, the organisation responsible for realising the energy efficiency measures pays all upfront costs. It is then gradually paid back by the building owner via a charge on the utility bill (ACEEE 2012). On-bill financing spares public entities from having to pay the initial investment costs. Instead, measures are funded from the budget that is freed up by reducing energy costs. On-bill financing is also sometimes referred to as energy performance contracting (Junghans and Dorsch 2015).

- **Support and incentives for private investments**

City governments can create enabling conditions and incentives for private actors, such as project developers, corporations and households, to invest in climate change mitigation and adaptation individually. For example, municipalities can grant tax abatements for citizens investing into climate-friendly buildings and household appliances (Junghans and Dorsch 2015). This approach does not generate revenues for the local government but allows it to use its limited resources for climate projects that cannot attract private investments.

### 3.3.4 Financial intermediation through specialised financial institutions

One of the main purposes of financial intermediation, as defined in this study<sup>20</sup>, is to channel money from organisations which are not willing or able to lend directly to local governments. National, regional or municipal financial institutions can be created to collect this money and on-lend it to urban entities. Through credit enhancement, risk pooling and matchmaking between project development and investors, such specialised financial institutions can reduce the risks of lending to municipal entities, thus making urban

investment more attractive for public and private financial institutions or investors.

- **Pooled financing mechanisms**

Provincial or state government agencies or municipalities can set up pooled financing mechanisms between (smaller) cities to aggregate the packaging, standardising, marketing and selling of urban infrastructure investments for the private sector (New Climate Economy 2014). Special mechanisms to pool smaller cities' resources allow them to access credit jointly.

- **External investment bodies**

Larger municipalities can create external investment bodies (e.g. local infrastructure fund, city climate fund) to manage local infrastructure projects and to match infrastructure projects with financial backers, encouraging private-sector consulting and investment (Kamiya 2016).

#### Box 4: Chicago Infrastructure Trust

**Short summary:** The Chicago Infrastructure Trust invests in sustainable infrastructure projects. It attracts private sector resources through alternate financing methodologies, such as public-private partnerships, joint ventures, private equity, and state, federal or private grants.

**Detailed description:** The Chicago Infrastructure Trust was set up in 2012 to invest in transformative infrastructure projects in several areas (energy, transport, urban development, telecommunications), comprising both hard and soft (i.e. organisational and institutional) infrastructure. The fund's mission is to help close the gap between the city's infrastructure investment needs and the financial capacities of its local government. To this purpose, the fund seeks to attract private investment to finance projects and then repays investors from the revenue stream generated by the project (or alternatively, from the savings generated by projects that reduce public costs) (Chicago Infrastructure Trust 2017).

The Trust is responsible for initiating projects and leading the project scope, design, procurement and implementation. To initiate projects, the Trust publishes various requests. However, private entities or individuals may also submit unsolicited proposals.

<sup>20</sup> Financial intermediation is often defined as the process performed by banks of taking in funds from a depositor and then lending them out to a borrower. In this study we consider financial intermediation to be the management of funding flows between two or more organizations.





Once a project is implemented, responsibility for operations and maintenance of the new infrastructure can shift to either the city of Chicago or private firms. The Trust is constituted as a not-for-profit organisation headed by a Board of Directors, whose seven members are appointed by the Mayor of Chicago with the approval of the City Council. At the time of its creation in 2012, it was the first trust of its kind in the USA.

The Trust is currently implementing two initiatives (Home Buyer Assistance Programme, Chicago Smart Lighting Project). The former provides grants to home owners to cover down payment and closing costs, while the latter consists of the conversion of 270,000 street lights from high-pressure sodium to LED technology. Five other initiatives have been approved but are pending implementation. There are also 6 projects classified as “potential initiatives” and 21 inactive ideas. Project proposals are prioritised according to their overall complexity and magnitude of revenue stream generated.

**Success factors:** One of the elements underpinning the operation of the Trust is its autonomy. Constituted as a not-for-profit organisation, the Trust enjoys a high degree of flexibility that allows it to devise specific financing mechanisms for each project, in order to attract investors. Rather than acting as a public agency, the Trust mediates between the city government and private investors to design partnerships that benefit both sides. At the same time, the sound and transparent legal framework of the Trust provides legal certainty to investors and allows the public to scrutinise its operation. All documents related to project proposals, bids for tenders, proposal assessments, contracting, and implementation progress, are publicly available and can be downloaded from the website.

**Challenges:** Generally, the Trust has not lived up to the initial expectations, as both the number of projects and the total invested sums have remained well below target. Interest on the side of private investors has been low. Between 2012 and 2015, the Trust only implemented one project. This could be explained by the fact that public-private partnerships require substantial, stable revenue streams, which most proposed projects could not guarantee. Another challenge has

been the internal structure of the Trust and the composition of its Board of Directors, which until 2015 met only sporadically. The Trust was overhauled in 2015, when the Board of Directors was expanded from five to seven members, many of which were replaced at this point. Since then, the Trust has expanded its portfolio to seven projects (Chicago Tribune 2015).

#### • National specialised financial institutions

Moreover, cities can apply for financial support from regional, national, subnational and local development banks or funds. These specialised financial institutions often have better access to international climate finance and can on-lend the money to sub-national entities. Moreover, they can provide guarantees. For example, FONERWA, Rwanda’s Environment and Climate Change Fund, blends domestic and international funds, and provides low-cost loans and grants for environmentally sustainable and climate resilient projects. Yet, this fund has so far invested mainly in the private sector. Case study 5 describes a fund that has been more active in municipal finance.

Both local and higher-level governments should strengthen existing specialised financial institutions. If no such institutions exist, they should develop new ones. National governments could provide greater leadership in establishing channels for funnelling resources to cities and supporting local governments to improve access to international financing (Godfrey and Zhao 2016). Bilateral and international organisations should help them.

However, specialised financial institutions and direct guarantees can also have negative effects: they shut out banking market players and stifle the possibility that direct municipal debt-financing activity on local capital markets will emerge (Paulais 2012).

#### Box 5: FINDETER (Colombia)

**Short summary:** Colombia’s national development bank FINDETER (Financiera de Desarrollo Territorial) offers rediscount loans and guarantees for financing infrastructure and environmental projects.

**Detailed description:** Colombia set up FINDETER in 1989 to facilitate decentralisation for local governments and address financing constraints

for infrastructure projects. As a quasi-public financial institution, it provides discounted loans to domestic commercial banks that lend to local entities. Also, technical assistance is given to beneficiaries of FINDETER finance, typically in the form of project preparation support. In addition to rediscount loans, the portfolio of financial products includes management of public funds, and guarantees and endorsements. The resources provided may be used by the local governments for working capital, debt substitution or investment projects related to the development of infrastructure, purchase of assets or implementation of new technologies. FINDETER has an AAA local credit rating that enables it to access less expensive financing. It financed about US\$ 4 billion in loans in over 700 municipalities over the five years from 2006 to 2010, while maintaining bad debt below 2% (FINDETER 2016).

In 2012, in partnership with Inter-America Development Bank (IDB), FINDETER created the Platform for Sustainable and Competitive Cities (CSC). Within two years of establishment, seven urban sustainability projects have received financial and technical assistance, and six more are in the pre-investment phase. Several cities received Environmental Studies, including urban footprint assessment and simulation of climate change scenarios, as well as Action Plans in fields of transportation, energy, climate change adaptation, and fiscal management. IDB and FINDETER support the implementation of these projects with resources for pre-investment and credit, as well as developing partnerships with public and private institutions in order to ensure the execution of projects. Resources are found from a variety of external resources, including bilateral donors (e.g. British and Swiss governments). In addition, FINDETER has channelled long-term financing for projects prioritised in the action plans and the IDB is also developing a loan to support the interventions in these cities, which will be implemented through FINDETER.

So far, four cities, Barranquilla, Bucaramanga, Manizales and Pereira, have received support for their Action Plans. With US\$ 480 million that has been channelled for investment in these projects, 25 per cent of the amount identified in the plans is being covered. This initiative demonstrates the potential for rapid scale-up of solutions through local-national-international partnerships.

**Success factors:** FINDETER's second-tier lender status makes it an unconventional type of municipal development fund. Over the time, it established itself as viable financial institution, financing more than 78% of its activities through revenue from existing loans. The initiative led to greater revenue collection and credit worthiness of local governments, effective access by municipalities to long-term credit, and ultimately improved urban services (Kharas and Linn 2013). In addition to providing loans, facilitating technical assistance led to improved technical capacities of local governments. FINDETER's success with the refinancing of municipal loans has helped commercial banks to become familiar with lending to sub-national governments and convince them to lend directly to municipalities with their own resources (The World Bank Group 2016a).

**Challenges:** At the beginning, FINDETER's project review period was long, taking an average of up to 18 months. This limited the attractiveness of this financial approach for municipal governments. Later, a streamlined process was introduced (The World Bank Group 2016a).

### 3.3.5 Reforming governance for a better climate finance system

#### National level

National governments should make sure that regulation affecting the local level stimulates climate-smart development and enables municipalities to access the funding they require.

- **Redirecting national public funds to climate-smart development:** National governments have a powerful instrument in reducing or eliminating subsidies on fossil fuels. Such reform discourages private investments into carbon-intensive sectors and frees up resources that can then be channelled for alternative uses such as sustainable urban development (Godfrey and Zhao 2016). Moreover, it makes climate projects more economically attractive and helps cities to justify them against non-climate projects (New Climate Economy 2016). Moreover, governments can redirect existing funding towards more compact and connected urban development, including





existing national urban infrastructure funds and other relevant funding vehicles.

- **Greater fiscal autonomy for cities:** National governments can speed up fiscal decentralisation to make sure that cities have the mandate for action. Cities demonstrating sound financial management and with adequate fiduciary safeguards in place should have the authority to: Raise and collect own-source revenues; Borrow, issue bonds and enter into public-private partnerships; Price externalities; Introduce new mechanisms to capture and utilise increasing land values, Establish green funds, with support from national governments for the necessary seed capital and technical assistance for these to commence operation, Increase their borrowing limits where debt caps are unnecessarily or artificially low (C40 Cities Climate Leadership Group 2016).
- **Stable investment frameworks:** National governments can support cities by developing clear and consistent investment regulations. For example, green bonds standards would make it easier for cities to issue green bonds and for investors to track impacts (New Climate Economy 2016). Moreover, cities can benefit from predictable and timely government fund transfers, to ensure cities can meet their financial obligations (C40 Cities Climate Leadership Group 2016).

## International level

- **Improving access to funding:** Existing international development banks and climate funds need to reform internal structures to allow for more cooperation with sub-national entities. It is still being discussed how such direct access should be designed in order to bridge the gap between the international level and the large number of small transactions and activities required (Barnard 2015).
- **Improving effectiveness of funding:** To enhance their performance in investing in sustainable urban infrastructure, development banks and climate funds should work closely with national development banks, local financial institutions and cities (C40 Cities Climate Leadership Group 2016). Additionally, the international climate finance community should support national, regional or municipal entities in setting up new financial institutions specialising in sustainable urban development. These new entities can then directly channel international funding to municipalities.
- **Increasing available funds:** International financial institutions should consider increasing the funding available for local sustainable development by earmarking large proportions of their financial resources for subnational entities and regional/municipal banks; increasing local currency borrowing; and tailoring lending products specifically to meet the needs and capacity limitations of cities. All funding should be used to catalyse action by others (especially the private sector), for instance by providing credit guarantees to reduce financial risks for private lending institutions (Barnard 2015).

## 4. Case study methodology

In the following, the status quo, challenges and opportunities for urban climate finance will be described for three selected municipalities/metropolitan areas, namely eThekweni (South Africa), Chile (Santiago) and Chennai (India). The case studies are based on extensive literature reviews and interviews with key stakeholders.

The **literature review** was based on online available documents, including official governmental documents, grey literature and other internet documents. The review was focused mainly on identifying the background, municipal finance and governance systems as well as the framework for urban climate action in the three cities. Moreover, information on the urban climate finance landscape, challenges and opportunities, was abstracted wherever available and then tested during the interviews.

The **interviews** were conducted by local experts with long-standing professional experience in climate-related fields. They took place in the period from December 2016 to March 2017.

For each case study, a list of key informants was generated as possible interviewees. Final selection was based on the interviewees' responsibilities and work experience with regard to urban climate finance as well as on their availability. While the majority of interviewees work in municipal, state or national public authorities, the private sector, academia, NGOs and international organisations (i.e. donor financial institutions and development cooperation agencies) were also interviewed (see chapter 13/Annex IV).

Interviews were semi-structured, based on a standardised questionnaire with 22 questions in the following four categories (see Annex 13 for the full list of questions):

- Understanding of urban climate finance
- Status quo and trends related to urban climate finance
- Challenges related to urban climate finance
- Opportunities related to urban climate finance

The interview results were systematically analysed and, together with insights from the literature review, used to develop the case studies. Throughout the following chapters, specific stakeholders will be referred to in parentheses wherever possible and helpful. Where no interviewee is cited, conclusions are based on several interviews. It is important to note that the interviewees' positions were not checked by their organisations and rather represent individual opinions.



## 5. eThekweni (South Africa)

### 5.1 Background: cities and climate change in South Africa

#### Cities and climate change in South Africa

South African cities play an important role in the country's economic and social development. Urbanisation is at a relatively high level (at 62%) and progressing at a rate that is slower but still in line with Sub-Saharan African trends. South Africa's eight "metropolitan municipalities"<sup>21</sup> (eThekweni among them) comprise about 40% of the total population, estimated at approximately 55 million in 2015.

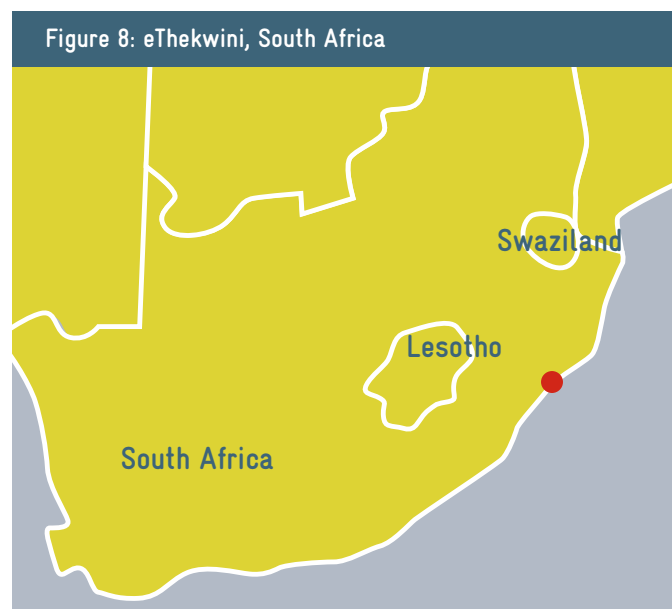
South Africa is in the relatively unusual position (for developing countries) of having to curtail its greenhouse gas emissions at the same time as adapting to the impacts of global climate change. The country is a high carbon emitter due to its currently heavy reliance on coal for power generation. Ranking as the 14th highest emitter in the world (Global Carbon Atlas 2015), South Africa's total GHG emissions in 2010 amounted to 544 million tons of CO<sub>2</sub>-equivalents (CO<sub>2e</sub>). The government has set the target to limit national GHG emissions to a value between 398 and 614 million tons CO<sub>2e</sub> including land use, land use change and forestry (LULUCF) over the period 2025–2030, under a Peak Plateau and Decline trajectory<sup>22</sup> (South Africa 2015). At the same time, exposure to climate risks is high.

The country's approach to climate change mitigation and adaptation is laid out in its 2011 National Climate Change Response White Paper and more recently in its Nationally Determined Contribution (NDC) in 2015 to the UNFCCC. While it is evident that the national government cannot manage climate risks or

achieve mitigation ambition without significant efforts and contributions of local governments, the contribution of municipalities to building a climate-resilient future is unclear and progress in operationalising the National Climate Change Response at the local level, although underway, has been slow. According to analysis by the (Technical Assistance Unit & Western Cape Government 2013), sub-national responses to climate change are "largely fragmented and lacking in scale".

#### eThekweni (Durban)

eThekweni is a metropolitan municipality that includes the city of Durban and surrounding areas. The local government structure responsible for managing the city is known as eThekweni Municipality.



Source: EYES-OPEN

21 A metropolitan municipality, according to South Africa's Constitution, executes all the functions of local government for a city. In areas which are primarily rural, local government is divided into district municipalities and local municipalities.

22 According to the NDC 2015, national greenhouse gas emissions will peak between 2020 and 2025, then plateau for approximately a decade, and decline in absolute terms thereafter South Africa 2015.

eThekweni is the largest port and city on the east coast of Africa. With a population of almost 3.5 million people (2011 census), eThekweni is one of South Africa's most important urban, economic and political centres.

At the same time, the city is one of the country's poorest metropolitan areas. In 2009, 41.8% of its residents experienced conditions associated with poverty (Roberts and O'Donoghue 2013). Further social issues are related to the high incidence of HIV/AIDS, teenage pregnancy, etc. In June 2014, eThekweni faced a backlog of 393,294 housing units. Electricity and basic sanitation installations are available to only 75% of the city's residents, potable water to 91%. Limited availability of funding is one of the major issues for dealing with these backlogs (eThekweni Municipality 2015).

eThekweni has published an inventory of greenhouse gas (GHG) emissions in 2012. It showed that it emitted approximately 30 million tons of CO<sub>2</sub>e per year. The largest share (37%) of emissions was produced by the transport sector, followed by industry (32%). Emissions from the residential sector, commercial sector and municipal administration together made up about one third of the total. However, it should be noted that the municipality is raising questions as to the accuracy and currency of the data, suggesting that a further inventory process is required.

Regarding the impacts of climate change, it is expected that eThekweni will experience higher average temperatures, more rainfall, more frequent heat waves as well as sea level rise. More specifically, the Durban Climate Change Strategy (EPCPD and Energy Office 2014) identifies the following impacts of climate change for the city:

- **Sea level rise:** Expected to be greater than the current rate of 2.7 (+/- 0.05) mm/year.
- **Temperature:** The average annual temperature increase is expected to be between 1.5°C and 2.5°C by 2065, and increase between 3°C and 5°C by 2100. The number of heat waves is predicted to increase as well.
- **Precipitation:** Potential increase in aggregated rainfall by 2065 with an increase of up to 500 mm by 2100. The northern parts of the municipality are expected to experience increases of up to 20% in long duration rainfall (1 day and longer). The outer

west areas are predicted to experience increases in short duration rainfall which may lead to localised increases of up to 30% in short-term flooding. An estimated 30% to 100% increase in year-to-year rainfall variability.

Recent experience has demonstrated that water is the biggest risk facing the city, highlighted by its experience of the country-wide drought faced by South Africa and many of its neighbouring countries (Tooley, G., Kumar, K., O'Donnoghue, S). Water, as a primary input for commercial and livelihood generating sectors such as agriculture and tourism, is a stress multiplier through which climate change impacts cascade through a system. Food security in particular under threat as farmer production declines well below the levels needed to feed the population. Additionally, water is an important driver for environmental protection, with water quality of rising concern in urbanising areas. There is no alternative to water; technologies that could utilise the ocean resources are both very expensive and energy intensive.

eThekweni covers a large geographical area which places significant pressure on the municipality's water and infrastructure requirements. For example, eThekweni is responsible for looking after 4000 km of streams across the municipal geography, placing pressure on the human resources needed to manage this amount of water (Tooley, G.). Furthermore, there are new township developments under way, which also have a bearing on infrastructure. Climate change presents a large risk for infrastructure – old and new – in eThekweni with a corresponding responsibility to develop climate resilient infrastructure (Kruger, A.).

Municipal revenue is also at risk from climate change. The main sectors impacted by climate change are also the biggest revenue generators for the municipality: electricity distribution is the biggest, followed by water (including wastewater and sanitation). Public transport could be next (Kruger, A.).



## 5.2 Municipal finance framework

### 5.2.1 Municipal governance and finance

The Republic of South Africa has a three-tier government system, constituted by the national government as well as provincial and local governments. At the local level, the constitution distinguishes three types of municipality: metropolitan municipalities (“metros”), district municipalities (category B) and local municipalities (category C).

The Constitution of the Republic of South Africa (South Africa 1996) determines that local governments have to fulfil five key functions: to govern in a democratic manner; to ensure the provision of basic services; to promote social and economic development; to promote a safe and healthy environment; and to encourage community participation in local governments. The specific competences of municipalities include, for example, municipal planning, public transport, storm water management and municipal street lighting. While metropolitan municipalities carry out all of the functions listed here, district municipalities share powers with local municipalities. eThekweni is a metropolitan municipality (“metro”) and thus has more functions than B and C municipalities.

The following acts further determine the local governance and finance framework:

- The **Municipal Systems Act** (No. 32 of 2000) clarifies the executive and legislative powers of municipalities. It establishes a framework for effective local government by describing the processes and requirements for integrated development planning, performance management and public administration. The Act also entails provisions for municipal service delivery, credit control and debt collection. It promotes the participation of local communities in local governance.
- The **Municipal Finance Management Act** (MFMA) (No. 56 of 2003) determines detailed rules and requirements for managing revenue, expenditure, assets and liabilities in municipalities; budgeting and financial planning processes; borrowing; handling financial problems; and ensuring transparency and accountability in municipality’s finances.

It clarifies and separates the roles and responsibilities of the council, mayor and officials in municipal financial management.

- Public procurement in South Africa is regulated by the **Preferential Procurement Policy Framework Act 2011**, with stringent rules about procurement processes, noting that a revised set of procurement guidelines was released in early 2017. The requirements are fairly bureaucratic while intending to create equality of opportunity and inclusiveness in the economic system of the country.

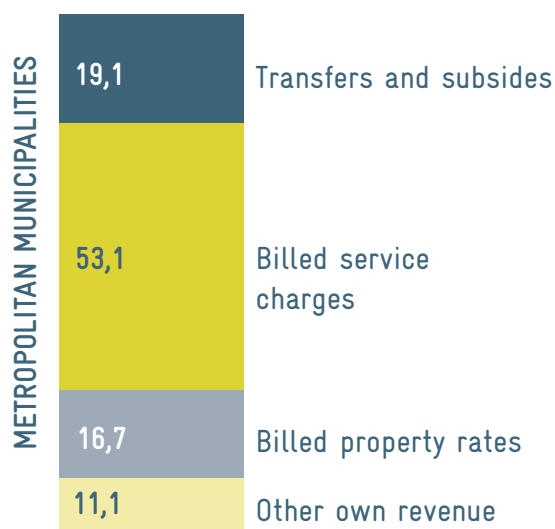
There are a number of plans that a municipality is legally obliged to prepare. The majority of mandatory plans cover a medium term time frame of up to five years.

- An **Integrated Development Plan** (IDP) provides the policy framework for the development of a municipality by determining municipal priorities and coherently linking all relevant plans and development proposals. It is reviewed every year and can be renewed every five years. All municipal projects have to be aligned with this plan. The IDP also forms the policy framework and general basis on which annual budgets must be based.
- The **Spatial Development Framework** (SDF) is an integral part of the IDP. It guides and informs all planning and development and all decisions regarding planning, management and development in the municipality (Afesis Corplan 2013). While SDFs are critical for climate change planning, they are generally not well aligned with sector plans across South Africa.
- **Sector plans** are prepared for each service sector of the municipality. Sector plans are the basis for budgeting processes, and municipalities submit their budgets annually to national government for approval. In most instances, allocations received do not meet stipulated and budgeted needs.

## 5.2.2 Sources of funding for municipalities

### Municipal own-source revenues

Figure 9: Revenue sources of "metros" (in %)



Source: National Treasury South Africa 2016a

South African municipalities are legally entitled to levy **charges on municipal services**. Service charges, particularly for water and electricity, are major sources of income for metropolitan municipalities (see figure 9). Service charges amounted to 48.2% of eThekweni's revenue in 2015 (National Treasury South Africa 2016b). Electricity sales provide around 35% of city revenues. However, recent increases in the costs of bulk electricity and water have reduced the surpluses municipalities generate from these services.

Municipalities are also entitled to charge **property taxes**. Property tax is based on market values of properties, which are reviewed every three years. Tax rates vary between business, commercial, industrial, mining or residential properties and are determined centrally for South Africa (Stanton 2009). Property tax made up 19.9% of eThekweni's 2015 budget (National Treasury South Africa 2016b).

**Other sources** of municipal revenue include rental income, interest and investments, traffic fines, licenses and permits, agency services, entrance fees for municipal facilities, etc. For eThekweni, other sources together made up 13.6% of the 2015 budget (National Treasury South Africa 2016b).

### National government transfers

Through the annual Division of Revenue, national revenues are shared with the aim to subsidise the different spheres of government. Intergovernmental transfers to municipalities are made through the Equitable Share of taxes and through grants. Allocations can be conditional or unconditional.

- **Conditional grants** are specifically designed to support municipalities in closing the service delivery backlog deficit and to promote local economic development. They stipulate both the content and the outcomes of the project to be funded. Municipalities are not allowed to use unspent conditional grants for any other programmes. The size of the volume and the beneficiaries of conditional grants are usually determined annually by the national government. For example, with persistent drought conditions across the country, the dedicated infrastructure and rehabilitation grant was redirected to serve as disaster relief grant in 2016.
- **Unconditional grants** are linked to broad goals but do not specify how municipalities should achieve them. For example, the Equitable Share is an unconditional grant that financially assists local government to cover the operating costs for fulfilling its constitutional service delivery mandate.

Metropolitan municipalities also benefit from general fuel levy sharing. Other transfers are indirect contributions in the form of assets or in-kind allocations (National Treasury South Africa 2016a).

Overall, intergovernmental transfers and grants made up around 19% of the municipal revenues in metros in 2013. For eThekweni's, transfers constituted over 18% of the municipalities budget in 2015. However, as the National Treasury South Africa (2016a) states, "given the weak economic outlook and constrained resources<sup>23</sup>, provinces and municipalities will be required to improve efficiency and increase their own revenue streams in order to support growth". More focus will have to be placed on strengthening municipal revenues and improving capacity for debt management.

<sup>23</sup> South Africa is experiencing a net slowdown in economic growth. This is mainly due to the global financial crisis and international market turbulences as well as internal structural weaknesses (e.g. high unemployment) (European Parliament 2015).





## Municipal borrowing

Municipal borrowing in South Africa is highly concentrated among the largest cities, with metros accounting for 85% of all municipal borrowing in FY 2015/16 (National Treasury 2016). eThekweni had long-term debt amounted to ZAR61.5 billion in the first quarter of the 2015/2016 municipal financial year (up from ZAR9.5 billion<sup>24</sup> in FY 2013). Its debt to revenue ratio of was 32% at 31 March 2016.

The National Treasury indicates that overall, both the public and the private sector have increased their long-term lending to municipalities. Particularly the Development Bank of Southern Africa (DBSA), a public financial institution, is very active in municipal lending. DBSA's focus is on financing infrastructure projects. In FY 2013–2014 DBSA approved loans to municipalities worth ZAR4.2 billion, of which 55% went to metros, including eThekweni (National Treasury South Africa 2014).

Further funding comes from the South African commercial banks. A small holding of debt finance is also sourced from the Agence Française de Développement (AFD) who has recently extended a further line of finance to eThekweni. While the secondary market for municipal debt instruments has also grown substantially, growth was actually slower than expected. eThekweni Municipality Stock issues accounted only for a minor share of the municipality's debt funding.

An important factor that might affect municipal borrowing in the future is that South Africa's credit rating is about to be downgraded. However, eThekweni has a solid credit rating and is not affected yet.

### 5.2.3 Municipal expenditures

The two main types of **municipal opex** in eThekweni in FY 2015 were bulk purchases of electricity and water and employee-related costs.

In FY 2015, eThekweni incurred **municipal capex** of ZAR4.8 billion and the metro's current capex budget is around ZAR 7 billion (Kumar, K.). Projects with the biggest capex included rehabilitation of roads; upgrading

of ablution facilities; development of public transport infrastructure via the Corridor C3 project; expansion of Phoenix water treatment works; and continued development of the Western Aqueduct (Statistics South Africa 2016). Further planned and current capex projects include the Bridge City urban development project, a new township development which will include significant infrastructure development such as roads, water reticulation, housing, schools and hospitals (Epstein, H.), and the new fleet of buses currently being procured to enhance public transport delivery (Kumar, K.).

Municipal capex in eThekweni, as with most metropolitans and municipalities in South Africa is underfunded. In eThekweni inadequate capex availability is cited as being the reason behind investment decisions that favour lower, upfront capex and higher longer term opex (Kumar, K., 2016). In 2011, the Financial and Fiscal Commission found that a vertical funding gap in supporting municipal capital expenditure exists, noting that the infrastructure grants provided to municipalities does not cover the difference between own revenue and local government needs (Mahabir and Mabena 2015).

At the same time, municipalities across South Africa increasingly spend less than they budget. Figure 10 shows spending deficits of eThekweni in the years 2012–2015.

While the reasons for underspending are primarily about low levels of municipal capacity, there are important nuances to this issue. The main reasons for underspending are outlined as follows:

- Compliance with South Africa's rigorous procurement legislation is often cited as a barrier to spending with procurement processes consuming time and human resources that are often otherwise prioritised by municipalities for delivering basic services. Delays caused by procurement processes result in delays in implementation and therefore spending of resources (Tooley, G.; Kumar, K.).
- Delays in project implementation and delivery can also be attributed to problems arising from the public consultation process requisite to approving a project, to low capacities of suppliers or service providers and to corrupt tenders (despite the rigorous procurement legislation). On the latter, the

<sup>24</sup> Currency is the South African rand (code: ZAR):  
US\$ 1 = 13.29 ZAR (10-03-2017)

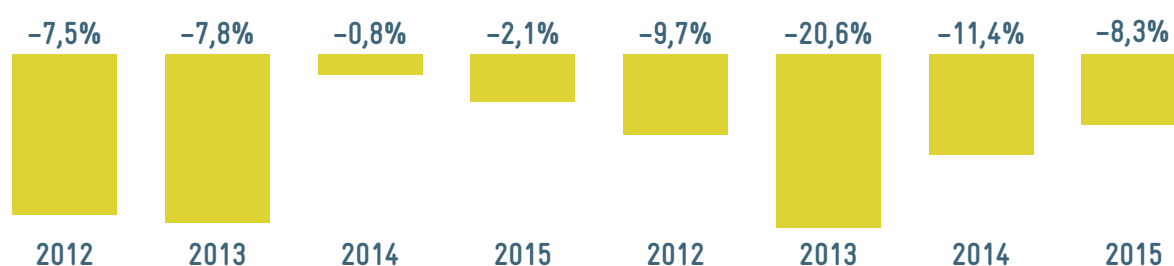
2009/2010 Auditor General's report on municipal spending and performance in delivering services found that municipalities (across South Africa) could not account for ZAR 10 billion for that year, attributing much of this to fraud and corruption and further found that failure to comply with public finance legislation and regulations is widespread (Prins, N.).

- Municipalities across South Africa are plagued by capacity issues, with less people employed than provided for in organisational structures. Having

said that, many believe that the organisational structures are 'bloated' in that not all the jobs provided for are in fact required (Naidoo, M.; O'Donnaghu, S.; Clement, M.).

- Municipalities are typically better geared for spending opex than capex. This is because of the strong orientation toward service delivery due to both their mandates and political pressure. Opex spend is more difficult to monitor and account for, with inefficiencies and corruption playing a role in underspending.

Figure 10: Spending of operating budget (left) and capital budget (right), eThekweni, 2012–2015



Source: National Treasury South Africa 2016

## 5.3 Framework for urban climate action

### 5.3.1 Climate-related strategies and structures at the national level

South Africa lacks overarching climate change legislation but action is currently underway. The Department of Environmental Affairs (DEA) recently commissioned the law firm Edward Nathan Sonnenberg (ENS) to draft a Climate Change Bill, with the objective of promulgating a Climate Change Act, under the jurisdiction of the DEA, should this be feasible. Early versions of the draft Bill are currently under review.

The **National Climate Change Response White Paper** describes priorities and flagship programmes for tackling climate change in South Africa but does not provide clear indications on the role and responsibilities of the different spheres of government. At this stage, planning for climate change is not explicitly mandatory. However, local government's responsibilities to deliver basic services, to promote sustainable development and to deliver the enabling environment to do so, are articulated in the Municipal Systems Act, and it is incumbent on municipalities to manage and mitigate

the ostensible risks to service delivery (such as water and energy) and to sustainable, local economic development. Arguably, municipalities, particularly metros that house and stimulate engines for economic growth and delivery, stand to face legal battles and costs of not taking mitigating or risk management action.

The official **Integrated Resource Plan 2010–2030** (IRP 2010) for electricity delivery in South Africa established a target for new installed capacity of large-scale renewable energy (RE) of 17.8 GW by 2030 along with a target for 200 MW from small-scale projects (**Smalls Programme**). Yet, a high level, mostly political energy conflict, is currently playing itself out, through the launch of an 'updated' IRP in December 2016. The Draft IRP 2016 proposes to constrain the annual build of renewable energy to 2010 IRP levels, giving preference to a policy-constrained scenario that accelerates a large scale nuclear building programme that would be procured and operated by Eskom (the country's vertically integrated state-owned monopoly utility that transmits, distributes and generates the bulk of the



country's electricity supply). The consultations process for the Draft IRP 2016 has brought the discussions on the future of Eskom to the foreground. The accelerated growth of RE, and the Independent Power Producer (IPP) model has challenged the utility's status quo and business model, with further decentralisation of energy supply threatening the organisation.

This decision to limit the annual build of renewable energy was made despite the fact that the renewable energy programme has exceeded all expectations on renewable energy generation, price reduction, deployment, job creation and foreign investment in South Africa. While vested interests are certainly at the centre of the conflict, it is also true that the country has undergone an economic decline, substantially reducing demand for electricity at a time when the new coal fired power plants started supplying additional electricity into the grid, coinciding with renewables coming on stream.

Some of country's larger metros, including eThekweni, are embracing and incentivising the growth of small scale RE generation capacity<sup>25</sup>. Moreover, metros are gearing themselves up for purchasing power directly from IPPs, thus incentivising the scaling up of alternate energy generation that bypasses the national utility and potentially enhances metro energy security. The evolution towards more empowered municipalities is likely to continue and is supported, albeit cautiously, by National Treasury (Prins, N.; Donaldson, A.). The National Energy Regulator (NERSA) has already awarded a tariff structure and license (as a pilot) to Cape Town City and other metros, such as eThekweni, Johannesburg and Nelson Mandela Bay, have similar plans. DBSA is positioning itself to foster public private energy partnerships (Sogobile, K.).

### 5.3.2 Climate-related strategies and structures in eThekweni

Climate action in eThekweni follows a "people driven approach" where measures are expected to contribute to easing the challenges of poverty, unemployment and

inequality. Against this background, eThekweni commenced its climate change efforts with a stronger focus on adaptation than mitigation (Roberts, D. Tooley, G.). Despite this early focus on adaptation, current efforts are towards balancing adaptation and mitigation, noting that mitigation efforts, such as roof-top PV installations at scale, are likely to yield important adaptation co-benefits (Naidoo, M.; Kumar, K.).

The **Environmental Planning and Climate Protection Department** (EPCPD) is responsible for the municipality's adaptation efforts. In 2004, the EPCPD (then called Environmental Management Department) initiated the eThekweni Municipal Climate Protection Programme (MCP, 2004). The MCP was initiated in 2004 (ICLEI 2012; Roberts and O'Donoghue 2013). It was developed over time through four phases (1) assessment of local impacts of climate change and proposed possible adaptation and mitigation responses; 2) adaptation planning for three pilot sectors (water, health, disaster risk management); 3) development of a GIS-based integrated assessment tool to identify high risk areas; and 4) institutional mainstreaming of climate change (establishment of a Climate Protection Branch within the EPCPD; establishment of the Energy Office (2009); establishment of the Durban Climate Change Partnership (2011)).

The primary adaptation focus is on water and eThekweni prioritises adaptation measures that help to increase water flows through enhanced ecosystems and improved biodiversity management (Tooley, G.; Clement, M.; Hlongwa, N). Key partnerships have been developed between the EPCPD and the **Water and Sanitation and Health Departments** and the **Disaster Management Unit** (ICLEI 2012). Particularly the Water Department has made significant progress in undertaking projects with collateral adaptation benefits. The Disasters Unit has increased its budget, in part with thanks to the **City Treasury**, for disaster risk reduction and preparedness.

The **Energy Office** (EO), in turn, is responsible for the municipality's mitigation efforts and currently reporting to the Deputy City Manager responsible for Treasury (change to this administrative structure is imminent) and the City's Strategic Office, also responsible for Catalytic Projects. The Energy Office manages a large number of mitigation projects that can be

<sup>25</sup> Municipalities believe that their mandate, which includes promoting development and the environment, is to ensure that energy services are both sustainable and secure, noting that energy security is a prerequisite for attracting investment in development (Kruger, A.; Greyling, L., December 2016).

classified into Energy Efficiency, Renewable Energy, Climate Change, Transportation and Green & Knowledge Economy.

The EPCPD and EO together facilitate the implementation of the Durban Climate Change Strategy.

### Box 6: Durban Climate Change Strategy (DCCS, 2014)

The DCCS identifies ten climate change themes and determines goals as well as responses to the risks for these sectors. Moreover, it defines 6 Flagship Programmes, covering water conservation and demand management, renewable energy, energy efficiency, transport, waste, and adaptation.

The DCCS has been formally approved. The EPCPD and EO are now coordinating the development of an **Implementation Framework** to operationalise the DCCS (eThekweni Municipality 2014/15). Moreover, they also promote mainstreaming of the strategy's recommendations into city-level and sectoral strategies (including the IDP, Energy Strategy and others) and municipal by-laws.

To ensure that eThekweni's climate change response is integrated with that of its neighbours, partnerships have been formed to some extent with neighbouring municipalities to co-ordinate a regionally appropriate response to climate change. An inter-sectoral **eThekweni Municipality Climate Change Committee** was formed to guide the implementation of the DCCS but was dissolved later on. Yet, the new mayor has recently agreed to restart the Climate Change Committee, which will provide political oversight on climate change action and contribute to resolving the cross-sectoral coordination challenges on

climate change, currently presenting a significant challenge to executing eThekweni's climate change responses and targets.

A partnership approach is perceived to be of growing importance for the delivery of climate responses in eThekweni. The **Durban Charter**, which is based on a Climate Change Compact, is due to be concluded in April 2017 and builds partnerships with neighbouring municipalities as far as Ilembe, thus including the Ilembe District Municipality on the East coast of KZN. A primary objective is to coordinate and leverage climate responses and finance, particularly to ensure that unintended consequences of climate action for neighbouring areas are minimised or mitigated. A further, important objective is to coordinate and entrench good practice of environmental protection, catchment management and biodiversity preservation (O'Donnaghue, S.).

Strong climate change champions have emerged from within the departments described above, and political champions have emerged in both the previous and present administrations. The new mayor has accepted the Vice Presidency for Africa to C40, following her delegating the next most senior officials in the administration to represent her and the municipality at the recent C40 Summit in Mexico.

Other municipal departments, such as Urban Planning, Economic Development, Electricity and Transport are less involved in climate change action in eThekweni.

Although many city officials regard climate change as an unfunded mandate, this is disputed by those that recognise the climate risks for service delivery, noting that municipalities are responsible for the delivery of basic services (Kruger, A.; Masenya, I.; Tooley, G.).

## 5.4 Landscape of urban climate finance in eThekweni

The next chapters will describe the sources and mechanisms of climate funding that are potentially used in eThekweni. It should be noted that the views of what qualifies as climate finance differ between stakeholders (Molefe, L.; Masenya, I.; Davies, H.; Tooley, G.; Sullivan, D.):

- Any finance that assists in responding to international climate agreements;
- In the urban context, finance that is applicable to ensuring mitigation of climate risks in urban development and service delivery including for example, finance to address mobility and urban planning;



- Finance that shifts the City away from business as usual and that incorporates sustainability.

### 5.4.1 Tracking urban climate finance flows

The details of funds allocated to municipal climate programmes are not publicly available, but are understood within the municipality. The City Treasury is able to track, and therefore knows, which departments are spending on climate change initiatives, and how much. They are presently developing a system for aggregating this information as required (Kumar, K.).

### 5.4.2 Sources and mechanisms of urban climate finance

#### Own-source revenues and intergovernmental transfers

Although domestic financial resources were allocated to climate change in previous years, little city budget has been dedicated to climate change since 2011 (Tooley, G.). Municipal adaptation initiatives are generally co-funded through direct budget allocation for related matters, as well as through time and staff commitments. For example, the majority of earlier work under eThekweni's MCCP was funded using the municipal biodiversity budget.

Intergovernmental grants are also playing a role, albeit limited. The Department of Energy is, for instance, the primary source of energy efficiency funding to eThekweni's EO, in the realm of R150,000/year, since circa 2009 (Masenya, I.).

eThekweni prioritises its project site selection based on prevailing poverty and unemployment issues. Nonetheless, funding and implementing adaptation projects is not yet done in a fully strategic manner and projects get implemented where funding is available. eThekweni officials observe that future funding should be more strategic. They also hold the view that the current structure and criteria of most of the intergovernmental grants need to be reviewed in the context of climate change (Masenya, I.; O'Donnaghue, S.).

This is particularly important considering that some pertinent city officials believe that expenditure for climate change will absorb as much as 70% of the municipal budget over time (Kruger, A.; Tooley, G.; Naidoo, M.). This further confirms the suggestion that responding to climate change is integral to future service delivery of municipalities.

#### National specialised financial institutions

South Africa has established the Green Fund (GF) to support urban and/or climate-compatible development. The GF, launched in October 2012 and administered by the DBSA, provides finance for green projects and mainstreaming activities which would not have been implemented without such support (Technical Assistance Unit & Western Cape Government 2013). The fund can offer grants, concessional loans, and equity (Hemraj 2014).

The Green Fund has provided limited funding to eThekweni. For instance, a R36 million was granted to the Buffelsdraai flagship project, a reforestation project aiming to offset approximately 42,000 tons CO<sub>2</sub> equivalent while at the same time creating local employment (eThekweni Municipality 2016). Overall, relatively little funding has flowed from the Green Fund directly to metropolitan municipalities.

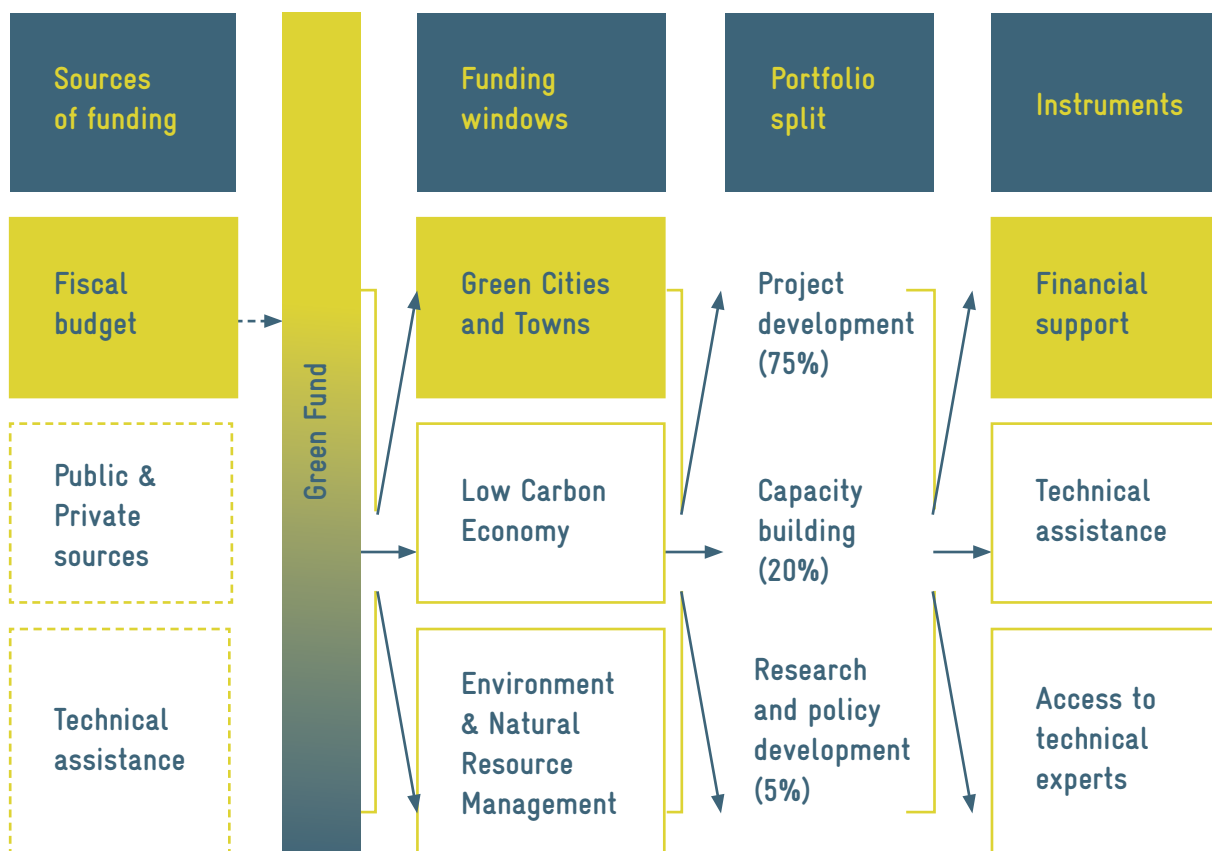
However, the DBSA intends to place greater emphasis on climate finance, both through the window for cities within the Green Fund and through their status as an accredited NIE to the GCF (Preston, G.; Manyike, T.).

#### Private investments

Another element central to eThekweni's approach is the building of PPPs, leveraging investment (land, money, etc.) from the private sector for water and biodiversity projects (clearing of alien invasive species, rehabilitation of degraded catchments/sub catchments etc.). For example, Tongaat, a major player in South Africa's sugar industry, is such a partner on two important projects. Firstly, Bridge City development is facilitated by investment in a shopping mall by Tongaat, intended to attract property development. Secondly, the land made available for catchment rehabilitation belongs to Tongaat. A combination of corporate social responsibility and business drivers appear to stimulate this private involvement (Tooley, G.; Epstein, H.; O'Donnaghue, S.).



Figure 11: The Green Fund (Hemraj 2014)



### International public finance

eThekwini uses some sources of international funding to supplement municipal resources, on an ad-hoc basis (Roberts and O’Donoghue 2013). For instance, the Energy Office initiatives (solar power on city buildings, tariff structure and a policy for embedded generation) are 95% funded by donors, with little certainty as to future financial flows (Masenya, I.; Naidoo, M.).

Bilateral funds are provided through donor governments:

- The Agence Francaise de Développement’s (AFD) strategy for South Africa includes a clear focus on promoting integrated urban development. The AFD can provide non-sovereign loans to subnational entities, and has extended direct loans to eThekwini and other metros. For example, in 2006 it granted a loan eThekwini aimed at a project involving land-fill waste methane-based electricity generation. In 2011, a loan was extended to the public entity “Trans-Caledon Tunnel Authority” to secure water supply to the eThekwini region (AFD 2016).

Recently, AFD has extended another line of finance to eThekwini. This direct cooperation is largely due to the strong credit rating of the municipality, the sustaining of which is an important element of climate finance access readiness.

- Funding for the development of an energy strategy was sourced via DANIDA’s (Danish International Development Assistance) Urban Environmental Management Programme, initiated in South Africa in 2005 (Roberts 2008). This funding enabled eThekwini Municipality to institutionalise the EO and to evolve its mandate and capacities.

Significant success has been achieved with accessing the Global Environment Fund (GEF), with a successfully awarded GEF 6 project building on the outputs of a GEF 5 project (biodiversity, water and climate change), accessed by the EPCPD (O’Donnaghue, S.).

Efforts are being taken to access the GCF. Currently, the DBSA is providing support to the Department for Environmental Protection for the development of a





GCF project proposal for eThekweni. The project (Umgeni Ecological Partnership) requires investment in its development to a level of GCF readiness, that the DBSA intends to finance (O'Donnaghue, S., Manyike, T.).

Other than that, little funding has been accessed from multilateral climate finance sources in eThekweni. eThekweni has yet to access the AF. There does not appear to be a relationship with SANBI, the South African NIE for the AF, despite the fact that the City has an MOU with SANBI and that biodiversity is a significant adaptation focus (Clement, M, O'Donnaghue; S. Barnett, M.).

### Clean Development Mechanism

According to the Department of Energy which is the Designated National Authority (DNA) for CDM registration, South Africa had 21 projects registered with the CDM in 2013. In the past, eThekweni was relatively successful in accessing the CDM, with the flagship Durban Landfill project. Many lessons learned from developing this project are applicable to planning

for and delivering climate finance, not least of which is that a champion, is a critical success factor. Lindsay Strachan, Project Manager, Department of Cleansing and Solid Waste (DSW), for eThekweni Municipality drove this project successfully at the time (Tooley, G.; Rumble, O.).

In conclusion, although climate finance is perceived as critical across the municipality and flows are considered unpredictable (Masenya, I.; Tooley, G.; Kumar, K.), the priorities are numerous and a strategy for accessing adequate and predictable flows of climate finance does not exist, resulting in projects following available finance. In other words, if a donor or fund is prepared to put up finance, then the project they are willing to finance becomes the priority. Clearly, eThekweni would benefit from planning for and resourcing climate finance more strategically (Tooley, G.; Kumar, K., December 2016). It is widely believed that the bulk of the finance required will need to come from domestic resources and government transfers (Kruger, A.; Kumar, K.; Cartwright, A.).

## 5.5 Challenges for urban climate finance

### 5.5.1 Lower priority of climate change action

In eThekweni, climate change has long had lower priority than other more urgent social and environmental matters. Although progress has been substantial and political will has been strengthened, eThekweni, like all of South Africa, still has issues with unemployment, poverty, inequality, housing backlog and HIV/Aids infections. Environmental concerns revolve around air and water pollution, biodiversity and ecosystem degradation ((Roberts 2008, 2010) Tooley, G.).

While key departments, including water and environment, are highly aware of climate change matters, other departments are less aware and place higher priority on short-term economic development.

- The Electricity Department is not actively involved in the city's energy efficiency programme, which is funded by the Department of Energy and almost exclusively implemented by the EO (Naidoo, M.; Masenya, I.; December 2016).

- There is also little emission reduction progress in the Transport Department and City Treasury, as evident in the current decision making process over the procurement of a new bus fleet for enhanced public transport. The options being considered are diesel buses or an electric bus fleet (zero carbon once in operation). The Deputy City Manager, responsible for Treasury and eThekweni's Board Member for C40, has some influence over the decision. However, the capex for the electrical buses is "unaffordable" (approximately three times the cost of diesel buses) and even though the opex will be cheaper over the life cycle of the procured fleet, the capex factor is swinging the decision to procuring high emitting buses. It is apparent that related public health and local pollution considerations have not (yet) been factored into the costs and therefore the decision (Kumar, K.). While the city wishes to capitalise on CO<sub>2</sub> reductions and requires climate finance for capex, the rates of return must be evident (Kumar, K.).

- Urban planning is also less involved in climate change action in eThekweni. For instance, the development planning for the new township, Bridge City, has not (yet) factored in the impacts of climate change, with urban planners attributing their inability to integrate climate risks into spatial planning as a primary reason (Epstein, H.). Further, the EPCPD has not been involved in the Bridge City urban planning process (O'Donnaghue, S.; Epstein, H.).

Generally, broader community awareness of climate change issues and climate response successes and failures is low (Hlongwa, N.). This is partly due to the fact that project planners are generally not good at translating the project benefits into information that would incentivise communities and politicians alike (Tooley, G.; Mclean, C.; Naidoo, M.; Kumar, K.).

### 5.5.2 Evidence-based approach to climate change action

Given eThekweni's people-driven approach, caution, in the absence of analysis of socio-economic data, is another prevailing issue. Most municipal officials, of senior and middle management levels, require sufficient evidence before taking climate action, wanting critical, analytical information on the socio-economic consequences – or benefits. Loss of jobs, access to long-term and decent jobs, protection of enterprises and equality issues are among the main concerns, as aligned with the so-called national “triple challenges” of poverty, employment and equality.

So far, the eThekweni Municipality has undertaken cost-benefit analyses for some adaptation strategies. Amongst other things, the sustainability and decency of the jobs created through adaptation measures was assessed.

In terms of mitigation, a by-law is being considered to extend the existing Internal Energy Policy (rooftop solar and energy efficiency on public buildings and structures), externally. The Energy Office is conducting a pilot study on the rooftop PV on four city buildings with the objective of identifying and quantifying the social benefits (co benefits) of this initiative. Questions include, for instance: *What will extended embedded generation installations that are enabled to sell surplus energy into the grid do for job creation and is there real*

*potential for local content?* The results are intended to inform any scaling up activities (Naidoo, M.). Specifically, the issue with PV is that the city load profile and the PV generation profile are different, making it hard to balance demand and supply (Senchurran, S.).

More work is needed to understand the co-benefits of both adaptation and mitigation initiatives. Taking a value chain approach is highlighted as a key objective underpinning climate response action, meaning that the municipality's political and strategic leadership is of the view that being able to connect actions to up and downstream consequences is a critical success factor (Roberts, D.).

### 5.5.3 Lack of local capacity

In eThekweni, capacity issues prevail, through a combination of **inadequate human resources** (many jobs vacant) and **under-skilled staff**. Capacity is a frequently discussed challenge with almost every interviewee. There is broad consensus that capacity constraints are significant and that this is prohibitive in terms of effective project implementation, accessing funds and in following detailed and lengthy procurement processes.

- The EPCPD lacks human and financial resources.
- In the Energy Office, the two most senior positions are acting rather than permanent and around 50% of the positions are vacant.
- The Engineering Department operates at around 60% of capacity, citing lack of skills as a key barrier. In response, the city has a mentorship programme in place specifically to mentor young engineers. However, the city notes that it takes on average 10 years to train a Candidate Engineer (postgraduate with no experience) to a level of being able to effectively solve problems.
- The Disaster Management Unit has a low-level placement in the municipal hierarchy and lacks skilled and experienced staff. Additionally, disaster management is regarded by many as a responsive (i.e. relief and welfare) rather than a proactive function.
- The health sector is politically and developmentally valued but has serious limitations in terms of skilled staff and resources. For example, the primary



health-care function undertaken by the sector is an unfunded mandate.

- The water sector is influential within the municipal hierarchy (i.e. it is politically and developmentally valued) and is relatively well resourced compared to other sectors. It also has been able to retain a reasonable skills base (Roberts 2010).
- Urban planning does not have the capacity and skills to integrate climate risks into their spatial plans and do not have the financial resources required to outsource this analysis (Epstein, H.).

While the general consensus is that up to 60% of the jobs catered for in the city's human resource structure are unfilled (Kumar, K. Tooley, G.), some believe that this structure is "bloated" (i.e. there are more jobs than are necessary to deliver to mandate), a trend seen across the public sector at all spheres of government in South Africa (Kruger, A.; van Onselen). Coupled with this is that performance, in general is low, with municipal officials citing inadequate accountability levels, inappropriate performance metrics, poor communications between human resources and delivery departments, and low levels of motivation as the real reasons for poor capacity (Naidoo, M.; O'Donnaghue, S.; Ward, S.).

As a result, of mainly the capacity issues, eThekweni like most of its counterparts in South Africa, is not able to spend its existing budget allocations (Prins, N.; Kumar, K.).

### Lack of knowledge in regard to international climate funds

Despite having several National Implementing Entities to the GCF (DBSA, SANBI, Nedbank – one of South Africa's top four commercial banks – has a current and pending application for accreditation to the GCF), along with access to a range of accredited multilateral entities, knowledge of how to access the GCF and what it will fund appears to be limited to the EPCPD. Moreover, the City has never accessed the Adaptation Fund.

Wider spread knowledge of what funds are available, what their criteria are and how to develop successful proposals is needed across all climate-sensitive departments in the municipality.

## 5.5.4 Inadequate structures and processes

### Lack of clear climate change mandate and cooperation

Climate change-related mandates reside primarily with the EPCPD and the EO, effectively bypassing other critical departments, such as electricity and transport. Climate change is thus not mainstreamed into all sectors as effectively as possible.

At the same time, the municipality does not have solid cross-sectoral arrangements in place for climate change and cross-sectoral projects are not evident. The Durban Climate Change Partnership (formed in 2011 as an effort under the MCCP) and the Climate Change Committee (formed in 2014/15 to support implementation of the DCCS) were suspended. However, the mayor has recently agreed to reconstitute the Climate Change Committee and informal partnerships are being formed within and outside of the municipality (O'Donnaghue, S.).

### Lack of tools for climate planning

Urban planning is not taking climate change fully into consideration. This becomes evident, for example, in the Bridge City urban development as discussed earlier. The planning team is generally aware of climate change impacts but does not integrate them into the development, mainly because they do not have the tools to do so, particularly climate risk and vulnerability assessments that integrate with spatial plans (Epstein, H.).

## 5.5.5 Detrimental national legal and regulatory framework conditions

### Short-term perspective to investment

The regulatory framework provides for five-year plans, annual budgeting and quarterly and monthly reporting cycles and municipal performance systems and indicators are aligned with these time frames. For commitments of more than three years, municipalities have to implement specific requirements. Thus, in many ways, the framework acts as a disincentive for long-term planning and does not stimulate a careful evaluation of long-term capex versus opex requirements. As a result,

many capex requests appear unaffordable as the rates of return are expressed – and evaluated – in terms of short-term time horizons. Investing in an electric bus fleet may for example be much more attractive if expressed in a 10–20-year time frame that reflects opex reducing substantially as the electric buses are operationalised and diesel fleets are decommissioned; with the only running costs being human resources and maintenance. In this example, the longer-term cost reductions would be factored in to offset the immediate to medium term costs of capex.

### Bureaucratic procurement policy

Most municipal officials interviewed cited challenges in the procurement processes they are required to comply with, noting time delays, systemic barriers to procure the most appropriate skills and expertise for a contract, and capacity constraints as primary obstacles. In terms of delivering climate change solutions, officials often find it easier not to procure using public funding, relying rather on ad-hoc support from donors, which can allow them to procure or work outside the South African public system.

Interestingly, a different situation may emerge as more domestic resources are allocated to climate in the municipal finance system. A plausible pathway is that as climate change becomes properly mainstreamed into development plans and implementation and service delivery, the need for additional sub contracts for stand-alone climate change projects will decrease. For instance, climate resilient urban planning, for a development such as Bridge City, would mean that the procurement of sub contracts for roads, water reticulation systems, etc. will include climate change specifications in a procurement process that is otherwise business as usual to and therefore well understood by the municipality.

### Conservative financial interpretations of legislation

Financial regulation is complicated and oftentimes hard to implement in reality. Particularly the MFMA and other related legislation and public finance guidelines have rigid requirements. This system was designed to foster prudent financial management, maximise transparency and accountability, and has a number of

safeguards to protect the state from unsustainable debt. Interpretation of these rules by national key is often conservative and different departments have different views. An example is the interpretation of the MFMA by Finance departments that a municipality cannot invest on private property (Technical Assistance Unit & Western Cape Government 2013).

These challenges cause municipal authorities to take excessive caution. The process of finding adequate compromises can significantly delay the implementation of climate projects. Moreover, there is no incentive to establish solutions that are legal but outside a strict interpretation of the regulations.

### Limitations to raising revenue and borrowing

Limitations to the property tax diminish municipalities' full cost recovery potential. For example, the property tax rates and ratios for businesses, commercial, industrial, mining or residential properties are determined nationally; state-owned property can only be taxed at a low rate; and increases of the property tax rate are based on the annual consumer price index, which does not account for actual increases in property values. These provisions take away the power of municipalities to determine and adjust their property taxes in order to (dis)incentivise certain behaviour and to match revenues to expenses (Stanton 2009).

Overdrafts are deemed short-term loans (debt) and can only be incurred in accordance with section 45 of the MFMA and section 230 of the Constitution. This limits the use of short-term debt and requires a resolution of council and full repayment of the loan within the financial year. Further, South African municipalities may not independently seek international loans, with approval required at all times from the Minister of Finance. The approval process can be very time-consuming and reduces the attractiveness of international loans to municipalities.

The MFMA (Section 51) prohibits the national or provincial governments from guaranteeing the debt of a municipality or entity except to the extent provided by chapter 8 of the Public Finance Management Act. Given that many international financing require sovereign guarantees to provide loans to sub-national entities, this lack of a system of national government



guarantees diminishes the opportunities for eThekweni to access concessional loans.

These limitations are becoming more relevant against the background that the municipal revenue model is currently under pressure.

### 5.5.6 External factors influencing the municipal revenue model

The municipal revenue model, which relies heavily on electricity sales (up to 40%) and other service charges, is currently under pressure. Revenues are down because, on the one hand, demand for electricity has declined due to reductions in economic growth (Prins, N.). On the other hand, in response to the recent energy crisis and increased electricity tariffs, households and industry alike are increasingly installing small-scale energy generation for own supply (Mertens, T.). The High Energy User Group in the Eastern Cape is also agitating for reform and driving an increase in local generation capacity, thus reducing demand on the national electricity grid and municipal distribution systems (Mertens, J.; Greyling, L.). All of these factors are causing a decline in the sale of electricity, thus negatively affecting municipal revenues. Further revenue issues are already on the horizon as the drought experienced across the country has also reduced water sales.

At the same time, small-scale renewable energy production (and sustainable water management) can undoubtedly increase the quality of life in municipalities, e.g. by allowing to progress toward mitigation targets, increasing energy and water security and stimulating local socio-economic growth and development through local manufacturing, maintenance and installation of small-scale renewable energy generation capacity (Naidoo, M.; Kumar, K.; Greyling, L.; Kruger, A.). Against this background, the municipal revenue model needs to be adapted to allow for long-term sustainable development.

At the same time, political trends at the national level have to be taken into account when reconsidering the revenue system. As described above, changes to the IRP 2010 are challenging the future of renewable energy generation in South Africa. The National Treasury is also anxious for changes within the national energy system (unbundling the vertically integrated monopoly

held by Eskom) and concerned about the potential threat to the national fiscus should change go wrong (Prins, N.).

### 5.5.7 Lack or inadequacy of funds and financial mechanisms

In eThekweni the need for climate change adaptation responses, mainly to promote water security, is considered to be much more central than mitigation. The challenge, however, is that there is significantly more external finance available for mitigation than for adaptation activities and likewise, there is much more money available for energy projects than there is for water or ecosystem rehabilitation (O' Donnaghue, S.; Kruger, A.).

A related challenge is that adaptation and development are intertwined. Although this is also an opportunity, the present rules underpinning the current international climate finance architecture require that projects seeking climate finance can only be funded entirely by climate finance if they are additional – i.e. they are only being developed because of climate change. While mitigation projects in eThekweni, such as the rooftop solar on public buildings project, easily qualify for climate finance, the case is not as easily made for adaptation projects. Some of the water catchment rehabilitation projects (e.g. Umngeni), have been reconstituted as climate change projects (Tooley, G.). The water needs and risks have increased to the extent that more and more resources need to be put into water development and protection. However, the risks and pressure on water arises from a number of drivers and although climate change is one, so is population growth and urbanisation, increased development and infrastructure deterioration (Tooley, G.). Recent experience of bilateral donor finance, intended for a 100% climate finance programme for South Africa, demonstrated reluctance to finance water response initiatives where it is clear that climate change is exacerbating a maintenance problem. Such projects may however partially qualify for climate finance, meaning that a portion of the project spend may be sourced from climate funds.

Low predictability of international (climate) finance is also an issue for climate projects. Funding often comes on stream too quickly for careful preparation and the obtaining of all necessary authorisations from within



the government system. In short, government planning, authorisation and funding cycles mostly do not align with those of their external funders, placing increasing pressure on capacities and ability to deliver. In eThekweni, projects take place where external funding is provided and strategic planning is not yet a full reality.

Having said this, few are of the view that accessing finance is a barrier; the question rather is how to do this strategically so that eThekweni is positioned to drive its own climate and development agenda (O'Donnaghue, S.; Kumar, K.; Kruger, A.).

## 5.6 Opportunities for urban climate finance

### 5.6.1 Capacity building and cooperation

Capacities need to be built across the municipality and not just in the current silo-departments, who have excellent skills and resources (although not enough). In particular, municipal staff should be able to assess the (economic and social) costs and benefits of climate action as compared to business-as-usual development. In the next step, capacity building can focus on the communication of such socio-economic impacts to trigger widespread acceptance of climate change projects.

Capacity building by and within individual departments is not sufficient. Rather, it is suggested to build stronger relationships with key stakeholders (Kumar, K.; Naidoo, M.; O'Donnaghue, S.; Kruger, A.):

- **Universities, NGOs and consultancies** can support research, for example on the socio-economic impacts of mitigation and adaptation. eThekweni for example has a partnership with the Engineering Department at the university of Kwa-Zulu Natal (KZN) to upskill and source candidate engineers (Tooley, G.) and this is a model that could be extended to climate change research. The University of KZWN also has excellent research capacity on climate change and water, for example within the School of Agricultural, Earth and Environmental Sciences, and could provide applied, demand-driven research capacity to the municipality. NGOs and consultancies can also fill some of the research and implementation gaps within governments (UNDP-OneWorld 2014).
- The **South African Cities Network (SACN)**<sup>26</sup>, to which eThekweni is a member, also provides support

for urban climate finance. Amongst other things, SACN has published recommendations on “Sustainable financing for today’s and tomorrow’s cities” as part of its State of the Cities Report 2016 (South African Cities Network 2016).

- The **Cities Support Programme (CSP)** was developed by the National Treasury and other government departments. The CSP currently supports eThekweni in developing a Corporate Plan; funding and financing models and institutional arrangements for catalytic projects; informal settlements upgrading; and the development of a longterm financial strategy (Cities Support Programme 2016). Given that one of the CSP’s four components consists of support for climate resilience and sustainability, more focus could likely be placed on urban climate finance for eThekweni.
- The **C40 Cities Alliance** (eThekweni is a member and steering committee city) is also a very relevant partner for climate finance capacity building in eThekweni. Together with other partners, C40 has initiated the Financing Sustainable Cities Initiative in 2016 with the aim to develop a peer-to-peer learning community; provide technical assistance; and set up an online engagement platform.
- Moreover, eThekweni is one of the **Rockefeller Foundation’s** 100 Resilient Cities.
- Cooperation with the **development banks** is also crucial to increase understanding of the opportunities for international (climate) finance. Opportunities for cooperation to increase access to the AF and GCF are discussed in chapter 5.6.3. The DBSA is already supporting the development of a GCF proposal to the municipality and this relationship could be strengthened. Furthermore, the African Development Bank has a demand driven facility for

<sup>26</sup> SACN is a network of South African cities and partners that promotes the development of productive, inclusive, sustainable and well-governed cities through research and shared learning.





accelerating GCF readiness in government across Africa, that to date is untapped by South Africa's municipalities.

- Cooperation with the **private sector** increases understanding of the factors that make climate projects more economically attractive for private investors. Tongaat is already a significant partner on climate change and other developments and initiatives in eThekweni, and there are other private sector investors with a similar corporate social responsibility, investment development and environmental protection agenda.

### 5.6.2 Improving the structures for climate planning and finance

- **Mainstreaming:** A majority of municipal officials believe that domestic budget that integrates climate and development will fund climate resilient urban development in the future (O'Donnaghue, S.; Tooley, G.; Kruger, A.). Climate change thus needs to be mainstreamed into the services delivered by the municipality. For example, urban planners should take climate risks into consideration in order to avoid increasing the city's vulnerability to water stress; housing and transport departments need to set-up climate resilient development specifications for new developments; etc.
- **Longer-term planning:** The interviews have shown that emphasis should thus be on better, longer term municipal planning with time horizons of up to 20 years (Kruger, A.; Kumar, K.; Cartwright A.). This view is driven by the understanding that the nature of the current and traditional municipal revenue model conflicts with municipalities' mandate to provide sustainable services and negatively affects access to long-term finance.
- **Monitoring, reporting and verification (MRV):** Tracking climate projects and climate finance through robust and consistent MRV and public expenditure frameworks will increase ability to access urban climate finance. Moreover, careful MRV will also allow eThekweni to proactively distancing itself from the precariousness of national credit ratings. Appointing an independent MRV consultant to ensure that the reported GHG savings are independently verified could be helpful.

M&E is a critical component of a comprehensive climate governance framework that will, if effective, yield benefits the municipality (enhanced CF access, improved knowledge of the social benefits of climate responses, etc.), the province (validated advancements toward provincial climate strategies) and national government (validated contributions toward achieving national climate objectives and international targets, particularly those stated in SA's NDC to the UNFCCC). To this end, investment into robust MRV will also be critical for eThekweni as the city strengthens its ability to track climate finance expenditure, and to monitor report on and validate the results. In other words, alongside M&E is a results-based financing of climate action.

#### Box 7: National Climate Response Monitoring and Evaluation Framework

South Africa's framework for tracking climate finance aims to allow for monitoring, reporting and verification (MRV) of financial flows, expenditures and results across different spheres of government, the private sector and civil society, thus differentiating climate from development expenditures. Since municipalities are responsible for service delivery and are extremely close to climate risks, a national process for developing a harmonised M&E framework can benefit greatly from a bottom-up approach.

eThekweni was chosen as the target pilot city for the Department of Environmental Affairs (DEA) to test the evolving National Climate Response Monitoring and Evaluation (M&E) Framework, starting early 2017. The purpose of piloting across all spheres of government importantly, is to introduce a "bottom-up" perspective into the national M&E framework, while addressing the need for enhanced local level M&E.

Given the progressive and 'people-first' work being done on climate change in eThekweni, the city is an excellent target pilot. Yet, while eThekweni has been earmarked, few officials inside the municipality are aware of this and it is not yet clear as to how the pilot will work (for example, will all climate initiatives be included, or a sample?).

### 5.6.3 Sourcing additional investment capital

#### Public climate finance

- **Adaptation Fund (AF)**

Access to the AF could be a viable option for upscaling adaptation efforts in eThekweni. The city could learn from experiences made by uMgungundlovu District Municipality which leads the implementation of the AF-funded project “Building resilience in the Greater uMngeni Catchment, South Africa”. The project receives around US\$ 7.5 million of funding by the AF and aims to increase resilience of vulnerable communities through interventions such as early warning systems, climate-smart agriculture and climate-proofing settlements (SANBI 2014). The project is implemented in coordination with the South African National Biodiversity Institute (SANBI), South Africa’s NIE for the Adaptation Fund.

- **Green Climate Fund (GCF)**

The GCF also provides a platform for accessing climate finance for scale, transformation and replication – and for contributing to the emerging performance metrics for the Fund. So far, no local-level projects have been funded yet in South Africa.

However, eThekweni is developing a GCF proposal that is currently in the concept note stage. The project (“Umgeni Ecological Partnership”) is led by the EPCPD, working through the DBSA, one of South Africa’s National Implementing Entities to the GCF. DBSA has indicated its intention to fund the development of the proposal to GCF readiness stage, to the value of ZAR 5 million. The project is based on a community partnership/ownership model (O’Donnaghue, S.). Specifically, it focuses on developing climate resilient ecological and built infrastructure in the Umgeni catchment, in partnership with local communities. An intended co-benefit of the project is job creation and enterprise development, as has been the case with other eThekweni ‘climate change’ projects. This is also in line with the ‘people first’ approach signalling eThekweni’s related commitment (Roberts, D.). The primary objective of the project is water security in the context of climate change and part of the preparation funding being accessed from the DBSA is earmarked for the

stakeholder engagement and buy-in process, to be conducted by EPCPD. The reason for spending this money on stakeholder processes is that the EPCPD and other departments within eThekweni have learned that one of the biggest barriers to successful climate change or environmental protection project implementation is community conflict, which usually arises from low/no buy-in and low/no awareness of risks and impacts and the benefits of responding (O’Donnaghue, S.).

GIZ and DEA are developing a programme across South African metros for accessing the GCF (Ramayia, J.). This is part of the effort to strengthen the contribution of cities to South Africa’s climate change objectives (Ramaru, T.). A programmatic approach has been identified by DEA as cost effective while also meeting GCF criteria for scale and replication of projects. The initiative will however require the agreement of all the metros involved and the initiative is still in infancy stages (Ramayia, J.).

#### Private lending and investments

South African commercial banks have increasingly shown interest in funding clean technologies and clean energy-related projects. For example, ABSA Bank cooperates with AFD to offer funding to private sector companies which inter alia assist government institutions with the design and implementation for energy efficiency and renewable energy projects. Qualifying projects will be eligible for a once off concessionary benefit of approximately 7% which can also be used as an equity contribution.

Johannesburg recently issued a US\$ 136 million green bond to finance a diverse range of investments, from hybrid buses to biogas energy and rooftop solar water heaters. The bond was 1.5 times oversubscribed (New Climate Economy 2014). eThekweni is further away from taking this initiative, preferring to identify their priority projects that also ensure that their approach of ‘people first’ is put into practice. If green bond issuance becomes relevant in the future, the municipality will be able to learn from the experience of the other South African cities that have issued green bonds before.

Insurance companies can also support municipal climate action. For example, Santam, South Africa’s leading short-term insurance company, supports collaborative



research related to climate change risk assessment and creation of appropriate risk mitigation responses. Amongst other things, it supported climate projects in Eden Municipality and Port Elizabeth (Santam 2015).

#### 5.6.4 Financial intermediation and external investment bodies

##### Special purpose vehicles to circumvent restrictive regulation

Where policies prevent or restrain the use of outside grants, this should be addressed through establishing a Special Purpose Vehicle (SPV) to facilitate implementation. The City of Cape Town was able to overcome legal issues in regard to financing private gain with public resources through the establishment of an SPV to assume the financial and legal responsibilities. The SPV, established as a non-profit community trust to manage the finances and implementation, did not face the same regulatory restrictions imposed on the municipality. Thus the SPV was able to utilise public finances to invest on private property, and reduce the private household costs of electricity (Technical Assistance Unit & Western Cape Government 2013).

A similar opportunity is available to eThekweni, particularly as the municipality strengthens its public-private partnerships (such as with Tongaat) and expands these to include a wider net of private sector players. The Durban charter and Climate Change Compact could play an important role in facilitating this transition.

#### 5.6.5 Improving the policy environment

Following an intergovernmental review of the local government infrastructure grant system, significant changes are being made to the way these grants are structured. For example, a new formula will be developed to allocate the ZAR6 billion per year set aside to upgrade public transport in 13 cities.

The previous system incentivised cities to plan overly expensive systems in the hope of receiving more funding. The new formula provides greater certainty about the long-term support the government will provide, and allows cities to plan affordable and sustainable infrastructure upgrades (National Treasury South Africa 2016a). Despite these efforts, the intergovernmental grants require further reform as they do not yet take specific account of climate change risks, the mitigation of which needs to be financed at increasing levels. Such a review could result in a new mechanism that, for example, promotes urban climate finance. A platform that encompasses the three spheres of government (local, provincial and national government), including National Treasury should be convened to do this.

It is widely acknowledged that the MFMA needs to be reformed. It is equally widely acknowledged that this is likely to be a slow process over many years. A more agile solution is for cities such as eThekweni to focus on fully integrating climate change into their development plans and service delivery models (in their IDPs), thus submitting requests for budgets that firmly incorporate planned climate change expenditure. The municipality will benefit from designing and implementing an effective climate finance tracking system, in parallel, that facilitates effective reporting on climate and development expenditure, in the required monthly and quarterly financial statements and quarterly service delivery reports. If National Treasury routinely sees evidence of effective climate change expenditure, it is more likely to approve subsequent budget requests that are likely to increase over time as climate risks become more evident and responses provide tangible and positive impacts.

South Africa's NDC is under further development. eThekweni has an opportunity to make a valuable and visible contribution to the realisation of both its adaptation and mitigation targets. This contribution does however need to be financed and accessing finance for this is enhanced by making the links between municipal climate objectives and national climate and development objectives explicit.

## 5.7 Conclusions and recommendations for eThekweni

### Conclusions on the status quo and challenges for urban climate finance

**Ambitious but evidence-based approach to climate change action:** Key departments (above all in the fields of environmental planning and climate protection, water and energy), supported by political climate champions, have successfully initiated adaptation and, more recently, mitigation projects in eThekweni. A climate change strategy (Durban Climate Change Strategy) was developed in 2014 and is currently being operationalised. Further concrete climate action will be informed by analyses of the value chain effects of potential measures. Given high poverty, unemployment rates and other social issues, municipal officials are careful to make sure that projects do not have any unwanted negative socio-economic effects.

**First experiences with monitoring climate investments:** The Treasury of eThekweni tracks climate-related expenditures and is developing a system for aggregating this information as required. Moreover, eThekweni was selected as a pilot city to test the evolving National Climate Response Monitoring and Evaluation Framework, starting in 2017.

**Lack of cross-sectoral cooperation and integrated urban planning:** Departments which could further catalyse eThekweni's climate response, such as planning, transport and electricity, lack tools and capacities to mainstream climate change. Knowledge transfer between departments is hampered by the lack of a municipal cooperation platform on climate change-related matters. This slows down the operationalisation of the Durban Climate Change Strategy. Moreover, existing regulation stipulates short-term (financial) planning, thus discouraging project planners from taking the long-term benefits of climate-smart investments into account.

**Challenges to current climate finance approach:** eThekweni's climate projects are funded mainly from the respective departments' budgets (as is the case for the adaptation projects implemented by the Environmental Planning and Climate Protection Department) or from multi- and bilateral funds (e.g. in case of the Energy Office's energy efficiency and renewable energy

projects). Several factors affect the effectiveness of this approach and make it necessary to strengthen climate finance for eThekweni in the future:

- **Changes in the municipal revenue model:** The traditional municipal revenue model, which heavily depends on electricity and water sales and other services charges, has become challenged by increasing renewable energy generation and water scarcity. High-level political decisions (e.g. in regard to renewable energy targets) and the speed of regulatory reform (e.g. of the Municipal Finance Management Act) will affect the degree to which municipalities can react to such shifts.
- **Lack of a climate finance strategy:** eThekweni has used GEF funding as well as bilateral finance and is developing a project proposal for the GCF. Yet, knowledge of the different international sources of climate finance and of their requirements is low. A strategy for accessing adequate and predictable flows of climate finance does not exist, resulting in projects following available finance.

The private sector has so far played a very limited role in urban climate finance in eThekweni.

### Recommendations

The recommendations for support to eThekweni in strengthening urban climate finance fall into three categories and in many ways cross cut other spheres of government and governance in South Africa:

#### Strengthen climate governance and institutional frameworks

- **Strengthen cross-sectoral cooperation:** An informal technical cross-sectoral climate working group (CWG) should be created that can later on be formalised with the re-establishment of the Climate Change Committee (CCC) under the Mayor's direction. Meeting at regular intervals, CWG representatives could discuss new projects or developments with a view to deciding whether and how climate change should be integrated into the project, what support for research and skills are needed, how to source these and how the project



specifications need to be adjusted to include climate change considerations (e.g. in case of an upgraded road or a new water storage facility).

- **Recognise and establish partnerships as central to the climate governance framework:** For instance, formal partnerships should be sought with universities, NGOs and consultancies, through MOUs that allow the municipality to secure services to operationalise priority aspects of the DCCS, strengthen the evidence base for eThekweni's climate response and build key capacities. MOU-based partners could be invited as appropriate to the CWG meetings and designated support climate services allocated to them.
- **Recognise and incentivise the role of civil society organisations in municipal climate action:** eThekweni's 'people first' approach necessitates civil society support, participation and accountability. Robust CSO participation should mitigate one of the primary blockages currently experienced by the City in project implementing projects, being community conflict or objections.
- **Strengthen the participation of eThekweni in provincial and national climate governance:** This should aim to go beyond participation in meetings and forums and extend into ongoing partnerships and processes for action. Cooperation with the DEA, such as is evolving on MRV and access to the GCF, will be particularly helpful. DEA and eThekweni (and other metros) should also collaborate on delivering and reporting local contributions to South Africa's NDC targets and objectives, bearing in mind that the National Government has to report to the UNFCCC on NDC progress in 2020.

#### **Climate capacity development**

- **Build climate capacity in key departments:** Capacity building is required to enable mainstreaming of climate change into development plans, hence driving climate-aligned budget allocations. Urban planning is an important priority area and the municipality would benefit from rapidly building the capacity of a target group of urban planners as additional climate champions. Other key departments, such as engineering, finance, transport, etc., also need to strengthen their climate capacities. An

approach should be followed that is similar to the capacity-building programme for city engineers. NGOs, universities and consultancies can support this process.

- **Ensure and increase engagement with South Africa's NIEs:** eThekweni could also learn from other climate projects, such as AF and GEF projects implemented elsewhere in the country. This could be achieved through strengthening the relationship with SANBI as the accredited NIE to the AF in South Africa (and as a newly accredited NIE to the GCF).

#### **Mainstreaming climate into revenue and expenditure models**

- **Mainstream climate into revenue and expenditure models:** Intergovernmental transfers and grants should be adapted to specifically consider climate change among their criteria; additional government transfer instruments might be necessary. At the same time, eThekweni (and other municipalities) needs to track shifts, e.g. regarding electricity and water sales and related regulation, so as to inform future revenue modelling and budgeting processes. However, revenue models are framed by the regulatory framework, such as the MFMA, and reform is likely to be very slow. In designing a programme for transformational change in revenue models, consideration should be given to:
  - the need for longer term strategic planning;
  - the role and buy-in of different actors, such as National Treasury, a central partner in transformation of revenue models and in approving changes to or additional transfer instruments;
  - the necessity for eThekweni and other metros to transition to a different view of the role of capex and opex in their expenditure preferences, structures and approval processes, and;
  - the entry points for climate change across different sectors and departments and how to coherently integrate these.
- **Longer term strategic planning:** Benefits of long-term planning could be made visible through supported pilots for long term planning for climate change in eThekweni, based on specific projects. Such pilots could be implemented through the





finance and planning departments for example and should be an agenda item for the CWG. The CCC could make important representations to national actors (e.g. National Treasury or the National Energy Regulator) to present successes and ideas for entrenching or scaling up related learnings or practices.

In conclusion, eThekweni is considered an excellent city to test, learn and scale up climate driven mainstreaming, capacity development and transformation. Lessons will be useful for other urban centres in South Africa, regionally and globally. The level of mainstreaming and long-term planning needed and proposed is however likely to challenge the way in which climate finance is viewed in multilateral terms. Many of the solutions considered critical to enhanced UCF are, if effectively implemented, likely to result in a situation where the argument for additional finance for climate change is no longer necessary or feasible.





## 6. Santiago (Chile)

### 6.1 Background: cities and climate change in Chile

#### Cities and climate change in Chile

Chile is a highly urbanised country. In 2015, an estimated 87% of Chileans lived in urban areas, a rate higher than the regional average for Latin America (80%) and much higher than the world average of 54%. Chile's urbanisation rate is expected to be practically stable between 2002 and 2020, increasing only one percentage point in this period, from 87 to 88%. Between 2002 and 2012 (year of the last census), the Chilean population increased at a rate of 0.97% per year, the fifth-lowest rate in Latin America (World Bank 2010; Instituto Nacional de Estadísticas 2013).

Chile is a unitary republic with three levels of government (national, regional and provincial). Municipalities (here defined as the governing bodies of so-called "communes") are not levels of government but rather instruments of public administration at the local level. The national statistics office distinguishes among four types of cities according to population (Instituto Nacional de Estadísticas 2005).

At the same time, Chile is highly vulnerable to the impacts of climate change. Due to its particular geography (stretching 4,300 km north to south, delimited by the Pacific coastline to the west and the Andes mountain range to the east), the country's regions are affected by climate change in different ways: from torrential rains and floods in the Atacama desert in the North to more frequent droughts and wildfires in the cool and humid South (Ministerio del Medio Ambiente 2008).

Many Chilean cities are directly threatened by climate change. Water scarcity is one of the main issues that they face, particularly in the arid north and the increasingly drier central region of the country. However, floods due to increasingly frequent torrential rains are also a problem in cities, since the sewerage systems often cannot discharge the excess water. Another key issue is the vulnerability of many Chilean coastal cities to rising sea levels. Higher temperatures, and increasingly frequent heat waves, are also regarded as a threat (Ministerio del Medio Ambiente 2008, 2016).

Category	Population Criterion	Cities that fulfill criterion (2012)
Metropolis	>1 million	Santiago
Great Urban Areas	>500,000 but <1 million	Gran Valparaíso, Gran Concepción
Large Cities	>100,000 but <500,000	15 cities
Cities	>5,000 but <100,000	117 cities

Chile has a moderate level of carbon emissions: at 4.73 metric tons of CO<sub>2</sub> per capita, Chile's emissions are almost half the OECD average of 9.65 metric tons (World Bank 2010). In its Intended Nationally Determined Contribution, Chile commits itself to reducing its CO<sub>2</sub> emissions by 30% per GDP unit by 2030 from the 2007 level (Gobierno de Chile 2015).

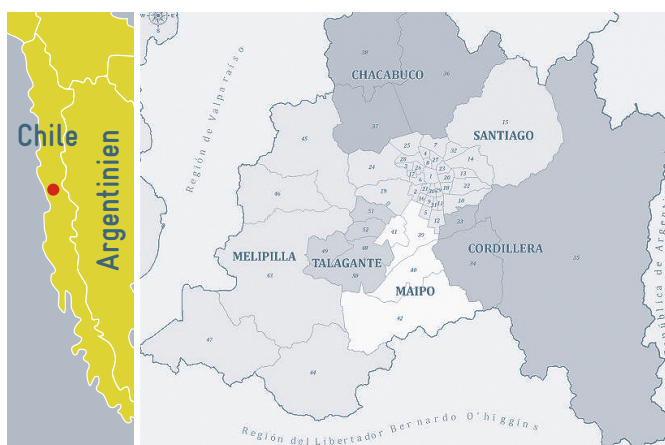
#### Santiago

The name "Santiago" can refer to different overlapping political and administrative units and there is no clear-cut definition of the "city" of Santiago (Trujillo et al. 2016).

- Chile is divided into 15 different regions, one of which is the **Metropolitan Region of Santiago** (MRS). In 2015, the MRS had an estimated population of almost 7.5 million people, equalling 41% of the total population of the country (Instituto Nacional de Estadísticas 2015). The MRS is formed by 6 provinces and 52 communes, distributed as shown in figure 12.
- Only one of these provinces, namely the **Province of Santiago**, is entirely urban. This province is comprised of 32 communes and has an estimated population of 5.6 million inhabitants (2017).
- “**Great Santiago**” (also called Metropolitan Area of Santiago) comprises all 32 communes of the Province Santiago plus the communes of Puente Alto and San Bernardo. This comes to be the main urban communes of the region.
- Finally, the **Commune of Santiago** comprises the historical centre of Santiago and has an estimated population of 386,471 as of 2017.

This case study will mainly analyse challenges and opportunities for climate finance on two administrative levels, namely for the MRS and for the communes making up Great Santiago.

Figure 12: Santiago, Chile (left); Metropolitan Region of Santiago (right)



Source: EYES-OPEN (left)

The population of the MRS has been growing at a rate of around 1% a year in recent decades. However, the urban sprawl has expanded at a much higher rate: the peripheral municipalities of the metropolitan area have

registered the highest population gains since 1982, while several central municipalities have in fact seen their populations decrease. Indeed, the total urban sprawl has increased four-fold in the last 50 years (Ferrando 2008).

Santiago, like the country as a whole, has a very high level of income inequality. In 2010, the MRS registered a Gini of 0.52, higher than those of Mexico City or Istanbul. Even though the population living under the poverty rate in Santiago decreased from 20% in 2006 to 9% in 2013, many socio-economic problems (youth violence, drug trafficking and addiction, chronic unemployment) remain (Trujillo et al. 2016) (Salcedo 2010).

The MRS is highly vulnerable to several impacts of climate change. Similar to much of the country, it MRS will very likely experience hotter and drier weather in coming decades (Krellenberg and Barth 2012; Krellenberg and Welz 2016).

- **Temperature:** Temperatures are expected to increase by 1–2 °C by 2045–2065, compared to the baseline (1960–2000). Far more days with temperatures over 30 °C are expected. Due to the urban heat island effect, heat waves will be most severe in the Santiago downtown area.
- **Precipitation:** Yearly precipitation is expected to decrease by 20% over the same period. At the same time, the intensity of precipitation events will increase. In February 2017, heavy rains in the nearby mountain range, caused by the slow ascent of the 0 °C isotherm, led to landslides and pollution of fresh water with excessive sediment levels. Santiago’s water processing systems had to be closed down, leaving the city’s citizens without fresh water for several days (El País 2017).
- **Fresh water:** The melting of snow from which the city derives much of its drinking water will reduce the flow of rivers in the MRS by 15–20% compared to the baseline. Water scarcity might be the most threatening climate impact. Since the population and the economy continue to grow, water demand is expected to further increase, while at the same time its availability will decrease.



## 6.2 Municipal finance framework

### 6.2.1 Regional/municipal governance and administration

The administration of Santiago is distributed among various authorities.

#### Municipal level

Municipalities are autonomous bodies that are administered by an elected mayor and council. According to the Constitutional Organic Law of Municipalities (Law No. 18.695) (Ministerio del Interior Chile 2006), municipalities have the following functions: Draft, enact and modify a Local Development Plan, which shall be coordinated with the Regional and National Plans; Draft and enact a Communal Regulatory Plan that establishes guidelines for territorial development; Promote the development of the community; Enforce the national and regional laws in the municipality and regulations concerning transport, public transport, construction and urban development; Guarantee the cleanliness of the municipality.

Municipalities can coordinate with each other through inter-communal agreements. In the MRS, coordination of services between the 52 municipalities is often hampered by political divergences, different priorities for urban development, lack of effective cooperation mechanisms, etc. This can negatively affect service delivery – for example, bike lanes sometimes end at municipal borders.

Municipal governments work closely with central government agencies on all matters of urban development. They are authorised to create administrative units to oversee each of these activities. Municipalities also cooperate with the regional government and can request its advice on matters related to economic, social and cultural development.

#### Regional level

Like all regions in Chile, the MRS has a Regional Government (REGO), governed by the Constitutional Organic Law of Regional Administration (Law No. 19.175) (Ministerio del Interior Chile 2005). Each REGO is led by an Intendent (designated by the President) and supported by a Regional Council.

The REGO of the MRS is responsible for the development planning of the region (including approval of (inter-)communal plans), management of funding from the National Fund for Regional Development (Fondo Nacional de Desarrollo Regional, FNDR) and advisory to the municipalities to support economic, social and cultural development. Through its planning and advisory functions, the REGO can exert some influence over the communes.

The National Ministries are represented at the regional level through Regional Ministerial Secretaries (Secretaría Regional Ministerial, SEREMI) and certain services with regional representation.

The powers of REGOs are relatively limited. In an effort to enhance administrative decentralisation, a new law (No. 20.990) was issued in December 2016 according to which regions shall be governed by democratically elected intendents (La Tercera 2016b). This will give regions similar status as municipalities, whose mayors are also elected democratically, and will shift some of the municipal functions to the regional level. Moreover, the parliament of Chile is discussing an amendment to the law No. 19.175 that will transfer several of the functions to the REGOs that are now managed by the national ministries.

#### Box 8: Decentralisation in Chile

On January 5, 2017, Law 20.990 “On the popular vote of the executive branch of the Regional Government” was enacted and published in the Official Diary of Chile (Microjuris 2017). The law introduced changes to 14 articles of the Political Constitution of the country. Through this law, the heads of the 15 Chilean regions are to be elected via universal suffrage in direct vote will be called Regional Governors (*Gobernadores Regionales*). Thus, Regional Governors will replace the Presidents of Regional Councils, who were appointed by the Regional Councils and who were the heads of regional governments until the enactment of Law 20.990. Meanwhile, the regional prefects (intendentes), who are appointed by the President of the Republic, will hereafter be called regional presidential delegates. Likewise, the provincial prefects (gobernadores) will

now be called provincial presidential delegates. The functions, attributions and structure of the regional and provincial councils, whose members are elected via universal suffrage in direct vote, are left unchanged through this law.

Regional Governors will be elected via open elections with at least 40% of cast votes, and they will serve for four years with the possibility of re-election for a second, consecutive term. They will be responsible for heading the regional government, while the regional presidential delegates will be in charge or representing the President of the country in the region. Hence, under the new political arrangement expects a degree of cooperation between the Regional Governors and regional presidential delegates. The specific attributions and tasks of Regional Governors will be stipulated in a forthcoming Organic Law.

Three weeks after the enactment of law 20.990, a bill to modify law 19.175 (the organic constitutional law on regional government and administration) was introduced at the Chamber of Deputies of the Congress of Chile on January 26, 2017. The objective of the bill is to disqualify members of Congress, acting ministers and other high-ranking government officials, members of the armed forces and public contractors from running for the office of regional governor. On March 1, 2017, the bill was submitted to the Congressional Commission for Interior Government, Nationality, Citizenship and Regionalisation of the Chamber of Deputies for discussion (Camara de Diputados de Chile 2017).

## National level

On the national level, there are 23 Ministries, and the different public services (such as Undersecretaries, Secretaries, Directorates, etc.) that depend on determined Ministries. Every Ministry has its own source of funding, according to each year's Budget Law, for internal administration. Some also have funds for investment (infrastructure, planning, subsidies, public bids, etc.). As described above, the National Ministries are actively involved in the governance of Chile's regions and communes.

## The role of the private sector

In Chile, the private sector plays an important role in municipal development.

- Chile is the only Latin American country that privatised its entire water supply and sanitation sector and hence all urban water companies are privately owned or operated (Baer 2014). Aguas Andinas, majority-owned by the Spanish company Aguas de Barcelona, provides water and wastewater management for 89% of the clients in urban areas<sup>27</sup> of the MRS. The other 11% are provided by a large number of companies with fewer client numbers.
- The whole electricity industry in Chile, including generation, transmission and distribution, is privatised with ENDESA as the largest company in the field (Kessides 2012).
- Most of the formerly state-owned telecommunications have been privatised in Chile, with the largest operators being Telefónica, Entel and Claro.
- Only the public transportation sector is operated by both private and public entities. Since 2007, the entire public transport system in Santiago has been reorganised into a multi-modal system, called Transantiago, which is heavily regulated by the government. The road-based transportation systems are now privately operated, whereas the rail-based modes are run by the public sector (Muñoz et al. 2009). For the first time, it is currently being debated if a new metro line (line 7) should be developed in cooperation with the private sector. Private companies increasingly become engaged in the transport sector. For example, the social enterprise Bicycle Latam developed Bikesantiago, the first intercommunal public bicycle-system in Chile (Bikesantiago 2017).

## 6.2.2 Sources of funding

### Regional level

Regions are financed through the National Fund for Regional Development (*Fondo Nacional de Desarrollo Regional*, FNDR). This is a rolling-application fund,

<sup>27</sup> Rural areas of the MRS, are covered by the „Rural Potable Water“ system in hands of Rural Potable Water Committees.



mainly used to finance infrastructure projects postulated by the Municipalities. Eligible projects are related to social and economic infrastructure and have to comply with Chile's environmental regulations. Moreover, projects should be in line with the priorities determined in the current Budget Law (*Ley de Presupuestos*), which in turn, reflects national development priorities (SUBDERE 2006). Additionally, FNDR funding can be extended to other entities (public and private), programmes, acquisitions and public concourses.

According to the 2017 Budget Law, the MRS REGO fund amounts to a total of almost US\$ 172 million, of which approximately 56% is destined to public infrastructure projects, mainly for municipalities. 29% of the FNDR is reserved for capital transfers to the private sector, mainly through the Innovation Fund for Regional Competitiveness.

## Municipalities

Municipalities have access to the following funds:

- **Contributions from the FNDR of the REGO:** As stated above, approximately 56% of the REGO's 2017 budget is destined to the municipalities that together constitute the MRS. If this money was distributed equally it would amount to no more than US\$ 1.85 million for each of the 52 communes. However, distribution is not equal between municipalities and usually a small number of communes get assigned larger shares while the others only have small budgets.
- **Contributions from the Municipal Common Fund:** The Municipal Common Fund is a mechanism that allows for sharing of revenues between municipalities across the country. Although all municipalities in the country receive resources through this instrument, communes with higher incomes contribute more monetary than they receive (SUBDERE 2009).
- **Own-sources revenues:** Charges for the services they provide and for the permits and concessions they grant; Fines and interests established to municipal benefit (such as vehicle patents).
- **Subsidies,** among others, depending on the municipality and its needs.

Some municipalities do not earn any considerable revenues besides through the Municipal Common Fund and thus have no more than US\$ 4–5 million (estimated) for all of their functions, the most expensive of which are waste management, public lighting and maintenance of green areas. As a result, 254 of the country's 345 municipalities closed 2015 with floating debt (La Tercera 2016a).

Overall, municipal budgets are highly unequal across Chile, with differences being harshest in Santiago. In 2015, four of the country's ten most indebted municipalities were located in the MRS (La Tercera 2016a). At the same time, four of the country's richest communes were also in the MRS (Santiago, Providencia, Las Condes and Vitacura).

## 6.3 Framework for urban climate action

### 6.3.1 Climate-related strategies and structures at the national level

On the national level, Chile has a National Action Plan for Climate Change (updated every five years, the 2017–2022 edition currently undergoing public consultations) and a National Climate Change Adaptation Plan (2014). Another key document concerning Chile's climate policy and sustainable development is its Nationally Determined Contribution, which was ratified in February 2017. These documents do not clarify the specific role of cities in climate change mitigation

and adaptation. However, a national climate change adaptation plan for cities is currently under development. The plan is expected to be published in 2018, along with several other sectoral adaptation plans.

Despite this lack of strategic guidance on climate-compatible development in urban areas, the national sectoral ministries and their subsidiary authorities support climate-smart urban development through some of their regular programmes, such as:



- **Ministry of Energy:** Supports energy efficiency for households and municipalities and provides subsidies for housing isolation and solar system installation. Given that the “National Energy Policy: Energy 2050” establishes the goal to achieve 70% of the energy mix with renewable energy by 2050, the Ministry of Energy and its downstream authorities (such as AChEE) have generally increased efforts to support the energy transformation in Chile.
  - **Chilean Energy Efficiency Agency (AChEE):** Supports energy efficiency projects, e.g. for the replacement of public street lighting with LED technology.
  - **Ministry of Housing and Urban Development (MINVU):** Together with the Ministry of Energy, supports households in reducing energy use through its initiative for Energy Labelling (Calificación Energética de Viviendas, CEV). Moreover, MINVU supports improvement of housing through its Family Heritage Protection Programme (with climate benefits mainly in energy efficiency and isolation); improvement of bikeway construction standards; etc. MINVU is responsible for the National Urban Development Policy that aims to foster sustainable cities and quality of life through transportation and territorial planning, etc. Further, it is currently in the process of developing a Sustainable Building Policy together with the Corporation for the Promotion of Production.
  - **Ministry of Environment:** The Environmental Protection Fund supports small-scale projects in energy efficiency, climate change, integrated waste management and biodiversity.
  - **Ministry of Transport:** Together with the Ministry Environment promoted, the development of a transport NAMA (Green Zone, Zona Verde) in the Municipality of Santiago.
  - **Under-Secretariat of Regional and Administrative Development (SUBDERE):** Implements the Urban Improvement Programme (PMU) in support of investments in urban infrastructure.
  - **Corporation for the Promotion of Production (CORFO):** Supports various types of action mainly for entrepreneurship and innovation, including through Clean Production Agreements; subsidies to small and medium companies for renewable energies; acceleration support for start-ups that foster “Smart Cities”; Housing Guarantee Fund.
- Moreover, a recent change in the institutional framework for climate change in Chile highlights that the topic is moving further up on the country’s public agenda:
- The **Agency for Sustainability and Climate Change** (*Agencia Chilena para la Sustentabilidad y el Cambio Climático*, ACSCC) was established in January 2017. It is the successor organisation of the former National Clean Production Council, a unit under CORFO. The main objective of the new Agency will be to promote and coordinate public and private climate action throughout the country to achieve Chile’s climate targets (Ministerio del Medio Ambiente 2015). The Agency will facilitate coordination between Chile’s development institutions, including CORFO, SERCOTEC and INDAP. In addition, it will integrate new capacities in support of climate financing, channelling international resources to the territories and companies (Fundación Terram 2016). However, the restructuring of the Agency has not yet been communicated widely and many MRS officials do not know about it.

### 6.3.2 Climate-related strategies and structures in Santiago

#### Regional level

The REGO does not conduct projects itself but rather prioritises and supports projects stipulated by the municipalities. Further, through its planning function it can stimulate climate-compatible development at the local level. The following strategies for the MRS make reference to climate change or indirectly contribute to strengthening mitigation and/or adaptation efforts:

- The **Regional Development Strategy 2012–2021** of the MRS names climate change as a strategic issue for the region (Gobierno Regional Metropolitano de Santiago 2014). One of its strategic guidelines is denominated “Clean and Sustainable Santiago” and defines several objectives that are directly or indirectly linked to climate change (encourage the use of clean energies; promote a regional adaptation system to the effects of climate change in the region;





promote the sustainable and strategic use of water; etc.). Yet, the corresponding indicators are unclear and incomplete and are not accompanied by target values.

- Santiago's **Plan for the Prevention and Atmospheric Decontamination** (PPDA) includes a series of measures to reduce the emission of air pollutants, such as the replacement of heaters and isolation of housing. Although the focus is not on the climate but on pollution, such measures can have co-benefits for climate change mitigation.
- Santiago currently develops a **Resilience Strategy** together with the Rockefeller Foundation. Climate change will be one of the factors considered by and for this Strategy that aims to promote the resilience of the city as a whole in the face of critical situations. The scope and implementation details for the Resilience Strategy are not publicly available yet.
- A **Climate Change Adaptation Plan for the MRS** was published in 2012 as a result of the 2009–2011 Climate Adaptation Santiago (CAS) Project. The plan recommends 14 adaptation measures and, amongst other things, assesses their financial implications (Proyecto Clima Adaptación Santiago et al. 2012). However, the plan was not approved because 1) some SEREMIs (particularly those of the ministries of Agriculture and Energy) did not agree with the proposed measures and because 2) there was no willingness to finance what was proposed in the plan (Carolina Eing, REGO MRS). Accordingly, none of the 14 measures have been implemented so far (AdaptChile 2015).

From 2010 to 2013, a Sub-Committee for Climate Change existed within the Regional Council of the MRS. This committee was mainly a space for discussion between Council members on climate-related projects to be financed by the REGO (project prioritisation being the Council's main task). After election of new Regional Councillors for the 2014–2018 period, the committee was not reconstituted.

The MRS is now in the process of establishing a Regional Climate Change Committee (*Comité Regional de Cambio Climático*, CORECC), which will be chaired by the head of the REGO and constituted by the SEREMI of the Environment, representatives of the

REGO, Regional Council, the academic world and other public services with competence in this area. This is based on the 2014 National Climate Change Adaptation Plan, prepared by the Council of Ministers for Sustainability and Climate Change (*Consejo de Ministros para la Sustentabilidad y el Cambio Climático*, CMSCC) which proposes to establish Regional Climate Change Committees in each region (CMSCC 2014).

## Municipalities

The municipalities are generally not very aware of the opportunities for climate change mitigation and adaptation. Recently, however, efforts have grown to anchor climate change action at the local level:

- **Local climate change plans:** Four of the municipalities in the MRS (Independencia, Providencia, Santiago and La Pintana) have local climate change plans. These municipalities are members of the Network of Municipalities for Climate Change (*Red Chilena de Municipios ante el Cambio Climático*) that was established by the Chilean NGO Adapt-Chile in 2014. Amongst other things, the Network supports its member municipalities in developing these climate plans.
- **Local Energy Strategies** (*Estrategias Energéticas Locales*, EEL): Seven communes in the MRS (Vitacura, Colina, Independencia, La Pintana, Recoleta, Peñalolen, Providencia) have developed Local Energy Strategies, and three further communes (Santiago, El Bosque, Calera de Tango) are in the process of developing theirs (Ministerio de Energía 2017). These strategies are based on an assessment of the need and potential for clean energy in each locality and establish clean energy goals and projects (Fundación Chile 2015). The initiative comes from the Ministry of Energy, supported by Fundación Chile and a Swiss Consultancy (Ernst Basler + Partner).
- **Sustainable transport:** The Municipality of Santiago, together with the Ministries of Transport and Environment as well as the British Embassy, developed the NAMA "Zona Verde" (*Green Zone*). The NAMA proposes four initiatives, namely i) Promotion of zero and low emission vehicles; ii) Clean and energy efficient public transport buses; iii) Promotion of non-motorised vehicle use; and iv) Traffic re-designs and traffic management (British Embassy Santiago)

2012). Based on this, an Integrated Mobility Plan was developed and several sustainable transport projects were realised, including introduction of an electric bus and three electric taxis, closing of streets for motorised vehicles and construction of cycle paths. A public bicycle system (BikeSantiago), which currently connects 14 communes of the city. The transport NAMA initiative stands out as a vanguard action, which visibly has climatic benefits. For example, in 2016, Santiago won the Sustainable Transport Award for its efforts (Municipality of Santiago 2016). However, criticism of the model is also generated, as it is not perceived as an action that will necessarily be replicated or implemented in its entirety, and is feared to remain as a pilot.

- **Initiatives with climate co-benefits:** According to interviewees, some of the projects undertaken by municipalities, for example in relation to street lighting and housing, have climate co-benefits. Such activities are supported by the national ministries through the programmes described above. However, efforts are dispersed among the municipal

departments of the individual municipalities and their contributions to mitigation and/or adaptation are not measured (Cordano, J.). This makes it extremely difficult to identify climate change-related efforts in individual municipalities and to assess the need for additional climate finance.

### Private sector

Some of the private utility companies servicing Santiago, such as Telefonica, Arauco or Aguas Andinas, generate and finance internal projects with climatic benefits, from the replacement of technologies to the company's day-to-day operational actions. Again, these projects often do not carry term "climate" in their name, nor is climate protection or resilience building the primary goal.

The private sector also invests into large renewable energy projects, mainly sun and wind (with support from national and international financial institutions). However, such activity is currently confined to rural areas or to the peripheral communes of the MRS due to the scale of such projects.

## 6.4 Landscape of urban climate finance in Santiago de Chile

In general, interviewees see urban climate finance as very positive as it can be used to contribute to the quality of urban life in many ways. However, it is rather associated with national public financing, as climate change is a very new issue and not yet installed in the Chilean State, and therefore, without great alternatives of climate financing in this way.

### 6.4.1 Tracking urban climate finance flows

Most of the interviewed experts are inclined to think that special monitoring of climate-related projects is not done in Santiago, even though this is not entirely certain as climate change efforts are somewhat "hidden" in the different municipalities and authorities active at the local level. It is argued that the climate change variable is considered as one variable more within the set of considerations of an initiative, and is not treated as a conditioning factor of a project. On the other hand,

beyond the administrative follow-up of every project, no public authority makes ex post or impact evaluation, so it is highly likely that there is no special monitoring on climate change initiatives.

In the Climate Change and Sustainability Agency (formerly known as the Clean Production Council), there will be procedures for measuring, reporting and verification on mitigation actions.

### 6.4.2 Sources and mechanisms of urban climate finance

#### General public funds that could address climate initiatives

There is no dedicated climate finance in Chile. Certain funds or financing mechanisms can have climatic co-benefits, such as those associated with energy initiatives, innovation and construction. The national ministries



support urban development through the initiatives described in chapter 6.3.1. Further, municipalities finance projects from their own budgets.

### Funding from the private sector

Some banks, such as BBVA, Banco BICE and BancoEstado, seek to encourage the generation of green projects. For example:

- In 2013, Banco BICE received a US\$ 75 million loan from International Finance Corporation (IFC) to fund long-term non-conventional renewable energy projects (Business News Americas 2014).
- Banco Estado received funding from the German Development Bank KfW to provide soft credits (“eco-mortgages) for insulation of private homes across the country (KfW 2016).
- Bice (and soon others) will also become catalysers of funding coming from the KfW through an initiative by the Corporation for the Promotion of Production (CORFO).

However, financing is usually limited to large-scale companies and projects. Given that municipalities are not subject to credit and can thus only indirectly benefit from such private climate finance through the recipients. Together with the important role of private companies in urban service delivery, this clearly shows that more attention needs to be paid to stimulating private investments in climate-smart urban development.

The development of Santiago’s Resilience Strategy is supported by the Rockefeller Foundation.

### International climate finance

While the list of international climate finance for Chile is long (GFLAC 2015), such funding is usually addressed at the private sector, at climate change mitigation in the forestry sector or at large-scale renewable energy projects outside of urban areas. International funding for urban areas is provided for

reconstructing and regeneration after disasters, such as the 2010 earthquake, rather than for climate-compatible development. Generally, Chile’s municipalities have not received much international climate funding yet, and where they did it was sporadic.

According to interviewees, international climate finance for the MRS was mainly limited to the funding provided for the Green Zone NAMA. The total cost of this NAMA is estimated to be US\$ 17.6 million. Funding is partly provided by the Municipality of Santiago itself as well as by the UK Government and IDB. According to information available online, additional funding of US\$ 9.6 million is required (NAMA Database 2016).

Overall, Chile’s commitments, activities and efforts on climate change still depend to a large extent on international financing. This might change in the near future because Chile’s rapid economic development in recent decades allowed the country to access the OECD in 2010 and to become classified as a high-income economy by the World Bank in 2012. Several bilateral cooperation agencies thus no longer consider Chile as an eligible country for their activities. From 2017, Chile thus ceases to be a priority for international development assistance (GFLAC 2015).

The effects of this switch from recipient to non-eligible country are currently not known. On the one hand, it might not affect municipal finance in any considerable way, given that municipalities have not received much international finance before. On the other hand, a reduction of loans and donations to previous recipients (including national ministries, universities, NGOs, etc.<sup>28</sup>) might stretch the budgets of these organisations to an extent where they should prioritise the most urgent initiatives, with the aim of focusing and making more efficient use of available resources.

<sup>28</sup> Analysis by GFLAC (2015) shows that public institutions, especially ministries, appear as the main beneficiaries of projects associated with climate change, notwithstanding that projects can be implemented by other organisations

## 6.5 Challenges for urban climate finance

### 6.5.1 Lack of awareness and public priority

One of the major issues for urban climate action is the lack of public priority given to climate change. In general, the issue is not a citizen concern, except at times when it is clearly visible or perceptible, such as during the heat waves and fires suffered in the Centre and South of Chile in January 2017 or during the landslides that affected fresh water supply in Santiago in February 2017.

However, since climate change is not yet a permanent concern, it tends to become invisible, particularly compared to more immediately pressing socio-economic problems. Stakeholders from all parts of the society, including government, administration, private companies and citizens, find it difficult to weigh what they are not able to see in their daily lives (Flores, F.). There is thus a lack of public awareness of the consequences of climate change and on the costs of inaction. This challenge was repeated in 42% of interviews.

This translates into a situation where public entities do not give priority to climate change. In general, a critical view is taken of the work carried out by the State of Chile in the field of climate. It is not clear what actions are being taken and even among public services, there is a low transfer of information. For example, regional and municipal authorities are generally unaware that Agency for Sustainability and Climate Change was established and have low knowledge of climate finance funds.

### 6.5.2 Lack of local knowledge, skills and capacity

The most mentioned obstacle corresponds to lack of consciousness, capacities and knowledge in the matter of climate change. 73% of the interviewees mentioned knowledge as one of the main obstacles to access to climate finance.

- **Lack of technical capacity and data for developing a response to climate change:** Responsible officials on the regional and communal levels tend to lack the skills and data for projecting future city-level

impacts, determining the costs of inaction and (economic, social) benefits of adaptation, identifying and prioritising adaptation measures, etc.

- **Language barrier:** The management of English is usually very low within regional and municipal administrations in Santiago. This is an issue, as most information on international sources of climate finance is provided in English, using complex technical terms (Reinoso, A.).
- **Lack of knowledge on sources of climate finance:** There is low knowledge of possible sources of financing for climate projects, whether or not they carry the title “climate finance”. José Miguel Addiaza (SEREMI of Energy, MRS) points out that “*the supply of financing instruments to execute the projects is not clear. The visualisation of these sources is missing. I wish there was a database with all types of financing*”. Even if funding sources are known, municipal officials often do not know how to apply to such funds (Reinoso, A.).
- **Lack of capacity for preparing and “selling” eligible or bankable projects:** It is perceived that a great deal of technical capacity is lacking to prepare projects that comply with international standards and/or the requirements of private banks and investors (Van Der Gaag, J.). Feasibility studies are not always conducted and some projects are not well designed or are too complicated. Moreover, municipal staff is not experienced in promoting and selling projects in a sufficiently attractive way that convinces all stakeholders.
- **Lack of capacity for climate finance tracking:** Keeping a close track of investments in terms of GHG reduction is very complex. There are different possible methodologies, but they do not measure profitability. Given that Santiago (and in Chile in general) projects are not categorised or assessed in regard to their climate co-benefits, information for climate finance is extremely difficult to compile. Particularly disaggregating data is very complex (Retamal, C.).

Overall, public authorities lack “updated professionals” to take on the current and future challenges (Ricardo



Lobos, Ministry of Energy). This issue is foremost based on the lack of awareness and public priority for climate change in Chile. Given low commitment, authorities have almost no incentives to search for skilled staff dedicated to this subject. This is aggravated by the fact that universities do not mainstream climate change into their curricula, and therefore, do not prepare their students in this matter, unless it is an environmental programme (Flores, F.).

Another factor with negative effects on the skills-base in Santiago is the low budget of many municipalities that keeps them from hiring sufficient and adequately skilled staff.

Moreover, awareness and capacity issues can also be noted in the private sector. Generally, the private sector in Santiago seems to be hesitant towards climate-proofing their investments, “*whether due to ignorance or fear*” (Cuadros, G.). From the point of view of private companies, slow change is rather linked to the fact that climate change mitigation and, particularly adaptation are often not linked to profits and can thus not be implemented (Flores, F.).

### 6.5.3 Inadequate institutional structures and processes

In regard to institutional structures and processes, particularly of lack of cooperation is seen as a very pressing issue that hampers concerted climate change action in Santiago.

- **Lack of inter-territorial cooperation:** Administratively, Santiago does not exist as a city. It is a confluence of at least 32 autonomous municipalities, without a government to coordinate them. The existing Regional Law is perceived to be too general to clearly define the functions of the REGO, hence culminating in loss of focus (Eing, C.). In reality, the REGO does not have the mandate and capacity to coordinate the municipalities. As a consequence, climate action is not coordinated between communes, leading to inconsistencies between the municipalities’ initiatives and inefficient use of resources. The atomisation of budgets hampers implementation of larger cross-municipal projects. Moreover, it is difficult to involve and coordinate several communes difficult when applying for international funding,

etc. It is important to transfer this peculiarity to the international financiers in order to strengthen for citywide efforts.

At this point, it needs to be mentioned that coordination issues are expected to diminish with the strengthening of the REGO through the new and upcoming decentralisation laws. Establishment of the MRS CORECC will provide further opportunity to guide discussions on climate change.

- **Lack of inter-sectoral cooperation:** Climate projects are located in different ministries or state services. They are often isolated from each other, and thus do not form a comprehensive portfolio. Cooperation between departments is usually restricted to a particular project or initiative. “*They were quite specialised in their subject, and in subjects like climate change I saw no connection between ministries*” (Lejtregger, R. in relation to a project on climate indicators in Chile). The lack of coordination and cooperation between different sectors hampers that a comprehensive vision on climate-compatible development evolves in the MRS. This lack of integration and coordination regarding climate actions is perceived at different levels of government: national, regional and municipal.

Another problem is related to urban climate finance in particular:

- **Lack of climate change monitoring:** The public sector investment review mechanisms do not provide for specific monitoring of climate finance and its impacts (Pablo Contrucci, MINVU). According to interviewees, citizens generally perceive the public financial monitoring and control system to be of low quality, causing a lack of data and information related to investments (Cañete, L.). This reduces confidence in public monitoring and might also discredit the projected costs and benefits of climate projects (once this is initiated).

### 6.5.4 Detrimental national legal and regulatory framework conditions

In Chile, municipalities are not subject to credit (in agreement with Law No. 18.695, Constitutional Organic of Municipalities) and can only access loans



from international and national banks through a ministry, on behalf of the municipality. This regulation constitutes a limitation to access financing and causes great dependence on funding from the national level. Therefore, initiatives rarely come from or are implemented at the local level.

The conflict over private property is an additional limitation to sustainable urban planning. In Chile there are very structural ideological issues related to the perception of restrictions on private property. There is no advance in urban planning because it is “attentive” against private property (Herrera, C.; General Water Directorate, DGA). This is exemplified by the great difficulties that DGA has had in the approval of laws such as the updating of the Water Code. In relation to this, Mrs Herrera argues that the only solution is to dare to legislate, avoiding to accommodate these limitations.

### 6.5.5 (Perceived) Unfavourable economic and risk profile of climate projects

The risks of investing in climate change are also an obstacle, particularly for investors from the private sector. On the one hand, uncertainty of climate change impacts, national policy priorities and regulations, as well as resultant changes in production and consumption patterns make it difficult for private companies to predict which investments will comply with their risk-return policies (Ruz, X.).

On the other hand, many climate projects cannot produce stable revenue streams while their non-financial benefits become apparent only in the long run (or not at all, if their impacts are not monitored). This leads to the belief by private companies that specific, early-on climate action should be funded by philanthropic organisations rather than by private profit-oriented companies, such as Santiago’s utility companies.

For investors from the private sector it is important to identify technologies and business models that create “win-win situations” for both public and private stakeholders (Flores, F.). At the same time, it would be important to highlight how climate change will affect major infrastructure in the long run and how adaptation (and, more indirectly, mitigation) can reduce the total life cycle costs of infrastructure.

### 6.5.6 Lack or inadequacy of funds and financial mechanisms

Some interviewees also note that capacity issues also apply to those who are responsible for the revision of projects, for example, in the private banking sector. These institutions do not seem to handle the integration of the climate change variable in their evaluations.

Private companies also often do not evaluate and price in the social impacts of projects proposed by entrepreneurs (Ávila, F.). It is not only about having a good idea, but also about seeing the co-benefits and externalities, particular in a social sense (Cordano, J.). Reconciling the win-win is work of both the one who generates the project and the one who evaluates (Flores, F.). The low valuation of the side effects of projects will make it very hard to find funding for projects that generate monetary benefits only in the long term, i.e. by reducing losses and damages in the future.

Finally, international climate finance is characterised by complex language and mostly English-language documents that are often too difficult to understand for municipal staff. These issues do not only have to be tackled by the recipient of international climate finance but also by the providers.





## 6.6 Opportunities for urban climate finance

Several of the opportunities listed here focus on increasing consideration for climate change management in Santiago (and Chile) in general. This is a necessary precondition for the development and implementation of climate projects. Only once climate change has become one of the city's priorities will it be feasible to develop funding strategies.

### 6.6.1 Linking climate change and quality of life

An interesting link emerged between financing for climate purposes and financing for the operation of the city and the wellbeing of the people. Citizens are often the direct beneficiaries of climate projects, regardless of whether they carry the term "climate change" or not. One of the most important examples in Santiago is the improvement of the public transport system (through initiatives taken under the Zona Verde NAMA and the Integrated Mobility Plan) which not only generates fewer emissions of gases and pollutants but also shortens commuting times and increases access to public transport for all, thus positively affecting the quality of life in Santiago.

It is concluded that municipalities should first and foremost highlight the wellbeing-effects of projects. Focus should be on creating a vision of a better city, rather than a vision that is limited to mitigation and/or adaptation (Farías, F.; Montero, L.). This interaction between climate change and wellbeing needs to be reflected in urban planning (Palma, A.), e.g. through the integration of climate change indicators in regional and communal plans.

This is mentioned as a practical and strategic issue, on the one hand, because in Chile the concept of climate change or global warming still has some ambiguity and even resistance. On the other hand, by emphasising the quality of life of the population there is greater ease of "political sale" of the projects, since the concept of climate change is still very new in the Chilean institutions.

### 6.6.2 Awareness raising and capacity building

All interviewees agree that it is necessary to raise public awareness of the consequences of climate change, and increase capacity and access to information, both on climate issues and also on financing alternatives. While lack of awareness and capacity cannot easily be solved, it needs to be tackled in order to build strong foundations for concerted climate action in Chile.

As a first step, information about climate change needs to be disseminated among the institutions and citizens of Santiago to raise awareness and to reach a critical mass of people who support or even request climate action. One particularly promising approach is to work with previous successful examples of climate change mitigation or adaptation.

Next, technical skills have to be strengthened. Capacity building is particularly important to empower the territorial actors and to enable them to form their own opinions and discuss with actors from other sectors (Lejtregger, R.). For example, interviewees believe that MINVU now places greater emphasis on integrating climate change into housing and urban planning because the head of the Ministry is sensitised to the topic, as she was previously the Director of the National Environmental Commission (CONAMA, a former institution dedicated to environmental issues, prior to the Ministry of the Environment).

The capacity building need ranges from basic concepts of climate change and its interaction with the city to the formulation and evaluation of projects.

- **Contribution and vulnerability to climate change:** Above all, it needs to be understood how cities interact with climate change, i.e. how many GHGs each sector emits, how the impacts of climate change are going to affect the quality of life in the city and which socio-economic effects this will have. Such information is crucial for preparing and prioritising the most effective project proposals (Nicolás Huneeus, CR2). Moreover, it will allow Santiago to take better advantage of the business opportunities that come with climate-smart development (Cañete, L.).

- **Economic valuation of climate impacts:** An interesting measure for the incorporation of climatic variables is the economic evaluation of projected climate change impacts (especially on urban infrastructure) and, above all, the costs of inaction (Lejtregger, R.). This way, one could prioritise the most urgent actions and make climate risks more tangible as “*mobilisation is done when the climate risk is visible*” (Palominos, M.).
- **Sources of (climate) finance:** Further capacity issues to be tackled are knowledge of the different sources of funding for climate-compatible urban development and good understanding of the application processes (Montero, L.). In this regard, a competent climate finance-related agency could be appointed to generate a climate finance database that both public and private actors can access. Some interviewees consider it helpful to compile and share information on (successful and unsuccessful) climate finance experiences from abroad.
- **Project preparation and marketing:** While better knowledge of climate change and climate finance are basic pillars for climate action, municipal staff also needs to be trained in developing good project proposals that comply with the requirements of the different funding sources. These are often particularly demanding for international climate finance and private capital. Additionally, two thirds of the interviewees mentioned the need for training on how to “sell” a project to investors, citizens and other departments or higher levels of government.
- **Language:** Officials need to improve their English skills in order to deal with international agencies. Application for funding from multi- or bilateral funds and development banks usually requires proficient use of English. Moreover, the interviewees perceive that in general, there is no adequate management of the terms and phenomena associated with climate change, and it is a necessary factor to generate empowerment. Authorities and even citizens need to be able to use the same language.

There is the expectation that with the formation of the CORECC, the MRS will be able to advance in the promotion of training in climate change and generate competencies to apply for funds (Canals, J.).

Interviewees have highlighted that it is essential that the financiers, especially the international funds, also adapt to their “clients”, both in regard to the language barrier and to the levels of complexity and requirements for the application of climate initiatives.

### 6.6.3 Improving climate planning and financial management in Santiago

#### Strengthening the institutional framework for climate action

It is unclear which public institution leads the response to climate change in the MRS. This causes dispersion of information, unclear roles and, finally, inaction. However, the establishment of the new MRS Regional Climate Change Committee (CORECC) is expected to contribute to concerted climate action in the MRS. The CORECC will be a space for discussion between the Intendent of the REGO, the SEREMI of the Environment, representatives of the REGO, Regional Council, the academic world and other public services. It is expected to allow for strengthening cooperation both horizontally – between ministries or territories – and vertically – between national, regional and local governments. By coordinating the different initiatives related to climate change and, possibly, uniting some of the initiatives, climate action would become more concerted (Reinoso, A., Ávila, F.).

Given the current political decentralisation efforts in Chile, regional institutions are set to become more powerful and take over functions from both the national ministries and the municipalities (e.g. waste management, environmental issues). Most importantly, the regional authority will be democratically elected, and therefore, it will be as powerful as the municipalities’ mayors, but with attributions to make decisions in certain aspects when the mayors council does not agree. Hence, if the decentralisation trend continues and if a CORECC is established in Santiago, this is expected to have considerable benefits for the region-wide coordination of climate change-related matters.

At the same time, climate change also needs to be tackled at the local level. One of the interview partners (Cañete, L.) proposes to create specific climate change units in each municipality to manage climate change



issues. Such units could be established within the Environmental Departments that most municipalities have. However, this opinion was not voiced by other interviewees, possibly because they attribute climate responsibilities to the regional level. It currently remains to be seen how climate cooperation and coordination changes once the MRS CORECC has been established and whether or not additional climate focal points need to be created within individual municipalities.

### Strengthening the legal framework for urban climate action

Low priority of climate change poses a great barrier to climate change mainstreaming in urban planning and development. One quarter of the interviewees mentioned the need for a normative mediation that is transversal to the different sectors.

- For the local level, the possibility of creating Municipal Ordinances that define the integration of climate change in the internal processes of the commune is raised.
- Another opportunity that was proposed by some interviewees (Bastías, M. V.; Retamal, C.) is to create a decree or even a law on climate change to facilitate climate change processes in Chile. This suggestion is based on an analysis of a new climate law in Chile, conducted by the Centre for Climate and Resilience Research (CR2) of the Universidad de Chile and the Environmental Politics' Socioeconomic Impact Centre (CESIEP), in 2015/16. The results are not publicly available.
- Moreover, it would be helpful to have a legal framework on climate-compatible building (Lobos, R.).

### Making urban planning more climate-smart

42% of the interviewees mention the need to integrate the climate change variable in the planning processes, both urban/territorial and financial. Urban climate finance is seen as a great opportunity because a high proportion of municipal expenditures are spent on waste management, irrigation and maintenance of green areas and public lighting (electricity and maintenance) – areas that can benefit from climate finance.

It is thus proposed to integrate climatic factors and other variables such as the quality of life of the population through the following measures:

- **Dedicated climate plan:** It is necessary to determine specific climate change objectives for Santiago. The Climate Change Adaptation Plan for the MRS was not endorsed politically and, by now, it is considered outdated. Climate action in Santiago could thus be promoted by developing a new adaptation and mitigation plan for MRS, considering the work done by the Clima Adaptación Santiago (CAS) project that was in charge of developing the previous adaptation plan. It is proposed to review the work developed in Mexico City in this area.

### Box 9: Mexico City's Climate Action Programme 2014–2020

In the last two decades, Mexico City has steadily developed a comprehensive institutional framework to coordinate, implement and evaluate strategies for climate change mitigation and adaptation. Mexico City's Climate Action Programme (MCCAP) 2014–2020 is one of Latin America's most ambitious and comprehensive climate change programmes (Gobierno del Distrito Federal et al. 2014). There are six key elements that make the MCCAP 2014–2020 a good example for Santiago (Gobierno del Distrito Federal 2010; Gobierno del Distrito Federal et al. 2014; Secretaría de Medio Ambiente 2017)

- **Existence of robust scientific, technical and institutional foundations:** The MCCAP 2014–2020 builds on the expertise and capacities accumulated by the government of Mexico City and local research centres since the early 1990s, when the environment became a key topic in the local policy agenda due to the high air pollution levels of the city. Mexico City's climate policy began in 2000 with the creation of the first greenhouse gases (GHG) inventory. In 2004, the first MCCAP was published, followed by the second one in 2008. The current MCCAP, the city's third, was drafted by Centro Mario Molina (CMM), an independent research centre focused on energy and the environment, on behalf of the government of Mexico City. The methodological backbone of the programme are an up-to-date GHG inventory of Mexico City

and the GHG emissions baseline to 2025, which is the benchmark for the assessment of the programme.

- **Participation of a broad range of stakeholders:** During the elaboration of the MCCAP, two executive meetings between government representatives and over 30 civil society organisations and research institutions were organised in order to discuss a draft version of the document. Thereafter, a public consultation was organised in order to incorporate the concerns and recommendations of the general public.
- **Integration of climate change policy with local and national policy instruments:** The MCCAP is consistent with the General Climate Change Law (a federal law), the National Climate Change Strategy and a number of local laws: the Sustainable Development and Climate Change Adaptation and Mitigation Law of Mexico City, the General Development Programme, the Urban Development Programme, the Sustainable Water Management Programme, the Environmental Agenda of Mexico City and the Local Climate Change Strategy.
- **Intra-governmental coordination:** In 2010, Mexico City's Inter-Institutional Climate Change Commission was established to coordinate, monitor and evaluate the implementation of climate change policies in the city. The commission is composed of representatives from local ministries, government agencies, research institutions and the local legislative assembly.
- **Transparency and accountability:** All of the actions contained in the MCCAP have concrete goals and progress indicators. Each action has a responsible institution (which is accountable for its implementation) as well as participating institutions (whose collaboration is required). Upon completion of the MCCAP, the programme is subject to an independent evaluation performed by a non-governmental institution. The results of the evaluation are public. However, citizens can also file requests for information regarding the implementation of the programme under the National Access to Information Law.
- **International cooperation and participation in international organisations:** In recent decades, Mexico City has become involved in many international initiatives and networks, which enable the city not only to exchange expertise and experiences with other cities but also to enter international commitments and raise the visibility of its climate change policies. Mexico City is a member of the International Council for Local Environmental Initiatives (ICLEI), the Carbon Climate Registry, the Sustainable Energy for All network, the 100 Resilient Cities and the C40 Cities Climate Leadership Group.
- **Evaluation of "standard" planning instruments:** As was mentioned before, climate change should also be phrased as contributing to the overall development of the metropolitan region in order to allow for more buy-in from municipalities and citizens. It is considered essential to integrate climate risks into territorial planning instruments, such as the Santiago Metropolitan Regulatory Plan (PRMS, for its Spanish initials), the Commune Development Plans (PLADECO), the Commune Regulatory Plans (PRC), the Regional Territorial Order Plan (PROT). All of these plans need to be reviewed to see how they affect climate change (Arriaza, J. M.). Both amended and new plans should adopt a long-term view (beyond the political periods of four years) in order to adequately reflect the costs and benefits of climate action (Lejtregger, R.).
- **Evaluation and prioritisation of projects:** Existing and new programmes or projects should be reviewed in regard to their effect on and vulnerability to climate change. As a first step, the SEREMI of Environment of the MRS wants to develop a portfolio of climate projects that are planned or implemented by the different authorities in the MRS. Based on this, climate change action shall be prioritised (Canals, J.). However, it depends on the disposition of the other sectoral authorities whether this information can be gathered. MIDESO and Ministry of Public Works are taking efforts to evaluate projects with regard to natural hazards and climate risks (see box 12).



## Box 10: New national mechanisms for evaluation of climate-related risks

Starting in mid-2017, the Ministry of Social Development (MIDESO) will begin to apply the disaster risk variable, including related to climate change, to all the projects that enter their portfolio of evaluation. In this way, climate risks will be considered from the very origin of the projects, thus allowing to modify factors before implementation. However, at least in the beginning, MIDESO's recommendations will not be binding and may not be considered in the development of the project (Standen, J.).

Starting in 2018, the Ministry of Public Works is set to consider climate change variables in the prioritisation of its initiatives and in investment planning.

## Focusing not only on planning but also on implementation

Emphasis is placed on the need to implement what is planned: criticism is made on the generation of many documents, studies, plans, policies, etc., which are usually archived without follow-up or implementation of measures (Vidal, P.). It requires *“creating an action plan that is possible to execute and looking for mechanisms to make it feasible”* (Canals, J.).

## Improving monitoring

Beside planning and implementation, monitoring is another issues that needs to be tackled in order to make sure that available funds are used as effectively and efficiently as possible.

One of the interviewees proposes to establish “a technical-autonomous institution that issues reports and maintains concrete indicators and targets [related to climate change and climate finance]” (Lobos, R.). This institution is suggested to be “technical-autonomous” rather than a political institution so that it has the autonomy to act, review and resolve in the climate change matter. If it is an institution whose objectives are related to linking finance with actions, it is important that it be flexible in its structure to allow greater capacity for action and reaction in emergencies (as is often the case in Chile, given its vulnerability to climate hazards).

## Increasing cooperation with academia and civil society

Several interviewees from public administration and academia suggest that it would be beneficial to strengthen the role of NGOs and academia in Santiago's climate action, particularly for the development of strategic planning instruments. Both have considerable capacity and technical expertise.

For example, an important contribution to the local level has been the Chilean Network of Municipalities for Climate Change, which was born in 2014, promoted by the NGO Adapt-Chile, as an instance of cooperation, training and exchange of experiences on climate change between municipalities in Chile. It is an open community to all municipalities that wish to take the explicit commitment to plan and manage their territory, considering climate change as the scenario that is determining the challenges of this century. Its mission is to position the Network as a national reference in the political, technical and communicational dimensions related to adaptation and mitigation to climate change at the local level.

There also need to be incentives or mechanisms that allow civil society to become part of the processes, defining previously what type of citizen participation is required.

## 6.6.4 Sourcing additional revenue and investment capital

With regard to new opportunities that have been underutilised, it is worth highlighting the possibility of using various national state funds that are not for climatic or environmental purposes, but can be applied along these lines. Examples are the regional development fund (FNDR), entrepreneurship funds (e.g. by CORFO), research funds (e.g. by the National Commission for Scientific and Technological Research (*Comisión Nacional de Investigación Científica y Tecnológica*, CONICYT)) and funds for architecture and media (e.g. the National Fund for the Development of Culture and the Arts (*Fondo Nacional para el Desarrollo Cultural y las Artes*, FONDART)), amongst others.

On the other hand, it is also perceived that the not enough use is made of the potential contribution that



the private sector could offer in terms of climate change. The generation of incentives or enabling environments for private companies to invest in new technologies or to improve conditions that have medium to long-term climate impacts would be an alternative to streamline climate financing without the need for the state to directly make the investments. A positive example of this is the work carried out by the Clean Production Council (CPL, now the Climate Change and Sustainability Agency), which, without major public investments, has had a strong impact on the environment, by providing technical advice to companies to boost their production through “green” or “clean” mechanisms.

### 6.6.5 Financial intermediation

There is no Development Bank in Chile that could be responsible for leveraging resources for (urban) climate projects. The interviewees mention diversions entities that take on this role, although there are certain tendencies to focus the administration of urban climate finance through some entity that could facilitate access to different types of financing. This entity should have the capacity to work in coordination with other sectors and territories and should, ideally, be able to facilitate public-private cooperation and have a technical orientation (in opposition to a political-orientation). Among the entities mentioned are:

- **CORFO** is perceived as a good intermediary, as it is the closest that exists in Chile to a Development Bank. Within CORFO, the **Agency for Climate Change and Sustainability** was considered on several occasions as the ideal entity to take over the responsibility for channeling urban climate finance, as in its old figure (Clean Production Council) it already made great advances in the climate change matter among private companies, generating improvements in the public-private relations. However, as it is a new institution, there is still no clarity about its attributions and main objectives.
- **Specialised United Nations institutions**, such as ECLAC or UNDP, have the capacity and experience to administer and facilitate access to urban climate finance. In general, there tends to be a good opinion of the work done by international organisations as intermediaries of foreign funds (and sometimes also

national funds). They are technical, non-profit and politically impartial entities, which is an advantage in relation to the conflicts of interest that often arise from the public and private sectors. It should be mentioned that these entities charge a fee for their services. This was in some cases seen as positive because it gives the possibility of demanding good results, as opposed to when the work is done by a public institution (for example, Chile’s International Development Cooperation Agency (AGCID) (Reinoso, A.).

- **SUBDERE** might be a focal point for urban climate finance in Chile, given its ability to coordinate local governments.
- **The Regional Government of Santiago** could become a climate finance leader for Santiago once all amendments to the Regional Law that are currently being discussed in the parliament are decided and implemented (Eing, C.).
- **A public-private or non-profit private entity** could also be appointed to manage (international) urban climate finance in Santiago. To do this, it would be necessary to train this entity properly and make sure that its orientation is clearly in line with the requirements and needs of the city.

Overall, there is no agreement as of yet which would be the ideal entity to be in charge of climate finance. Moreover, some interviewees think that there is no need of a specific climate finance institution. According to their opinion, the most efficient solution would be that all the different sectors incorporate the climate change variable in their projections and planning.

### 6.6.6 Improving the policy environment

Increasing attention on climate change on the national level would be expected to stimulate more concrete action at the regional and communal levels.

In regard to the policy framework for climate finance, the Government of Chile has put the Ministry of Finance in charge of developing a National Climate Finance Strategy by 2018. This strategy should take into account the expected new role of the regional governments in designing and guiding the climate change response at the regional and local levels.





Moreover, the national government should also take efforts to create an enabling environment for investment, with incentives for sustainable processes and, eventually, disincentives for consumption and production patterns that create negative externalities and reduce the risks associated with investing in climate-friendly projects.

Measures such as (1) regulatory reforms to reduce investment risks, (2) development and upscaling of financing instruments such as risk guarantee instruments and long-term debt finance, and (3) the implementation of corporate social governance standards in compliance with environmental and social safeguards are needed to increase private financing of climate projects (GIZ 2015).

## 6.7 Conclusions and recommendations for Santiago de Chile

### Conclusions on the status quo and challenges for urban climate finance

**Urban climate projects are challenged by low awareness, capacity and cooperation:** Awareness of climate change and the long-term costs of inaction is still low in Santiago, both on the regional level and in the communes that constitute the MRS. Climate change is not currently a public priority and, consequently, municipal staff do not generally have the skills that would be required to design effective climate projects and identify adequate funding sources. Cooperation between the municipalities, the regional government and national ministries or other authorities is limited.

**Urban climate finance is not a problem (yet):** Due to these reasons specific climate funding is not being requested. Interviewed experts suggest that if climate change becomes a priority and capacities get strengthened, funding for climate-compatible development can be made available from existing funds. However, this funding will have to be mainstreamed into regular public and private finance, rather than emerge as dedicated climate finance.

**International climate finance is not directly relevant for urban areas:** So far, international development finance has flown mainly to the forestry sector (CDM) and large-scale renewable energy projects implemented by private companies outside of urban areas. As municipalities in Chile are not allowed to take international or national debt, they depend on their own revenues and transfers or on-lending from higher levels of government.

**Real climate change-related needs are difficult to predict:** Important politico-administrative changes are taking place that are going to affect the approach to

climate change (including more power to the regions; establishment of regional climate change committees; and transfer of responsibility for climate action on the national level to the Agency for Sustainability and Climate Change under CORFO), making it hard to predict right now what will be specific institutional needs in the future. Moreover, it is difficult to predict how this is going to change available budgets.

**The private sector will play an important role in urban climate action:** In Chile, all basic urban services are fully privatised. Efforts to promote mitigation or adaptation will very likely involve the private sector (e.g. for water security, waste management, electricity generation). Municipalities themselves might not even need so much money – only to illustrate the business case behind climate-smart development and leverage private sector investments.

### Recommendations

#### Strengthen climate change institutions and strategies

- The national government, development cooperation agencies and NGOs should support the REGO and to the Regional Ministerial Secretary of Environment in constituting the CORECC of the MRS.
- The CORECC, once established, needs to compile and systematise information on climate change and related projects and funding, as such data is currently dispersed in various institutions.
- Climate change needs to be placed on the public agenda. An Adaptation and Mitigation Plan for the City of Santiago should be generated that goes beyond the four years of administrative terms. It is proposed to review the work of Mexico City in this area.

- For the implementation and mainstreaming of the climate plan into all sectors and municipalities, the CORECC will have to foster coordination and mutual cooperation.
- On the municipal level, planning tools (policies, strategies, plans, among others) with relation to climate change need to be strengthened. Examples of planning in the Municipal level are the Local Energy Strategies and the Local Climate Change Plans. The Chilean Network of Municipalities for Climate Change can play an important role in fostering municipal action.
- On the national level, it will be necessary to evaluate which agency will be responsible for leveraging resources for climate projects, since there is no Development Bank in Chile.

#### **Climate capacity development**

- Capacity building is required to empower authorities to discuss climate change-related matters among each other and with (inter)national organisations. Particularly development cooperation agencies should support training of professionals in climate change matter on different levels, public-private and national-regional-municipal.

#### **Leverage the (financial) strengths of stakeholders:**

- With all urban services fully privatised, efforts to promote mitigation or adaptation have to involve the private sector (e.g. for water security, waste management, clean energy). Municipalities thus need to create incentives for Santiago's private companies to take climate change into consideration and adapt their investments. One of the most important contributions in that regard is identifying and communicating climate measures with sound underlying business models. The private sector itself also has to look for business opportunities and competitive advantages through mitigation and adaptation actions.
- Strengthening the role of local NGOs in Santiago, e.g. in regard to the development of the city's climate change plans, might also be helpful due to their capacity and technical expertise, and their disinterested vocation. NGOs should become more integrated into international climate networks to further increase the national skills-base for climate-smart development. NGOs can even get accredited before conventions.
- Finally, the community itself should be considered as a generator of resilience. This requires incentives for households and local private companies to become active themselves.



## 7. Chennai (India)

### 7.1 Background: cities and climate change in India

#### Cities and climate change in India

India still has the largest agricultural population worldwide with nearly two-thirds of its population living in rural areas (UNDESA 2014). But urbanisation is progressing and by 2030, India's urbanisation rate is expected to increase from the current 33% to 40% with 590 million people living in urban areas accounting for nearly 70% of the country's GDP (McKinsey Global Institute 2010).

Due to population increase and economic growth, which is largely fuelled by coal, India's total GHG emissions have been growing significantly making it the fourth largest emitter globally. Even though India's Nationally Determined Contribution submitted under the Paris Agreement as well as domestic energy targets indicate a transformation in the country's climate policy, GHG emissions are expected to further increase. Simultaneously, India is highly vulnerable to climate change impacts primarily due to its economy's close ties with climate-sensitive sectors such as agriculture, forestry, and water. Many cities located on India's long coast line are exposed to sea level rise. Extreme weather events, including heat waves and floods, pose additional stress.

Despite attempts for greater decentralisation, India has a strong centralised federal system with the Union Government traditionally taking the lead. The scope for action of urban governments often remains limited and urban reform processes largely depend on (National and) State Governments (Jørgensen et al. 2015; Beermann et al. 2016). This also becomes apparent through the Smart City Mission, which was launched in 2014 by the Indian Government with the aim to ecologically modernise infrastructure and services in Indian cities, where the Union Ministry of Urban Development is responsible for implementing the mission in collaboration with the State Governments. But it can also be observed that local governments experiment with individual approaches to

climate change (e.g. New Delhi's first city-level climate change agenda, city networks, etc.).

#### Chennai

Chennai (former Madras) is the capital of Tamil Nadu, the most urbanised Indian State. It is governed by the Greater Chennai Corporation, headed by a mayor (Greater Chennai Corporation 2008). Its population grew from 2.6 million in 1971 to 4.6 million in 2011 (Census Organisation of India 2011). In 2011, the jurisdiction of the Chennai Corporation was expanded from an area of 174 km<sup>2</sup> to 426 km<sup>2</sup> and the new population is estimated to be about 7.1 million. The majority of the extended areas are semi-rural areas, which have insufficient coverage of urban services and need infrastructural support to provide basic services to the citizens.



Source: EYES-OPEN

Chennai is located in the Chennai Metropolitan Area (CMA), the fourth-most populous metropolitan region (8.6 million) in India according to the 2011 census. The

extent of the CMA is currently 1189 km<sup>2</sup>. This area comprises Chennai Corporation, 8 Municipalities, 11 Town Panchayats and 179 villages.

According to the Census of 2011, 84% of households of Chennai had access to tap water within premises, 99% had access to electricity, and 94% had sanitation facilities within premises (Census Organisation of India 2011). The extension of Chennai in 2011 into underdeveloped peri-urban areas led to a worsening of these figures. Further, the city faces substantial challenges due to the parallel growth of slums, where 28% of the city's population live with limited access to water and electricity and higher exposure to natural hazards (Census Organisation of India 2011).

A study by Shreejith and Ramachandra (2014) with data from 2009–2010 showed that Chennai was the highest per capita emitter of carbon dioxide in the country (4.79t of CO<sub>2</sub> equivalent emissions per capita). At that time, the largest share of emissions came from the residential sector (39%) followed by industry (20%), and transportation (19%). More data that is recent is possibly available from government reports and other organisations but has not been aggregated for Chennai.

Interviewed stakeholders from Chennai stated that the most relevant sectors for mitigation measures are transport (particularly inter modal transport, public transport, and NMT), power (renewable energy production, grid connection for solar energy, LED street-lighting and lighting for public buildings) as well as water and wastewater management (energy efficient pumping stations, waste-to-energy).

Tamil Nadu, and with it Chennai, is highly dependent on natural resources and faces the threat of climate change and its impacts. It is expected that the frequency and intensity of climate related natural hazards (e.g. storms, cyclones and tsunamis) will increase (Government of Tamil Nadu 2015).

- **Monsoon:** The post-monsoon period between October and December is the time when most of the annual rainfall is recorded, resulting in occasional flooding after intensive rainfalls. It is expected that monsoon patterns will change.
- **Cyclones:** Post-monsoon period is also when most cyclones from over the Bay of Bengal hit Chennai. According to the Tamil Nadu State Action Plan on

Climate Change, the number of cyclones may decrease in the future, even though their intensity and wind velocity could increase.

- **Sea level rise:** Impacts of flooding in coastal cities such as Chennai will be exaggerated by a rise in the sea level. The sea along Tamil Nadu coast is expected to rise between 0.19 m to 0.73 m by 2100. This will lead to coastal erosion (Government of Tamil Nadu 2015).
- **Heavy rains and flooding:** In December 2015, Chennai experienced 272 mm rainfall in 12 hours, i.e. 50% more than the city typically receives in the entire month of December. As a result, heavy floods inundated the city and the economic loss was estimated to be US\$ 7.43–14.67 billion.
- **Temperature and heat waves:** The average maximum and minimum temperatures for Chennai are expected to increase by 2.9°C and 3.3°C respectively. Although droughts are hardly occurring, there are occasional heat waves (Government of Tamil Nadu 2015).

Chennai is both water-scarce and prone to flooding, issues that are related to excessive urban expansion which leads to poor recharge of groundwater aquifers and blocking of natural drainage systems. Since Chennai is heavily dependent on monsoon rains for recharging its water resources, climate-change related monsoon failures make the city's residents highly vulnerable. The poorest and least connected inhabitants suffer most from water shortages also because they are less flexible to find alternative affordable sources of water (Roumeau et al. 2015).

The most relevant sectors for adaptation measures are thus water management (irrigation tanks in peri-urban areas, water logging prevention) and disaster Risk Management (planning and preparation for sea level rise including early warnings for flooding, storm water drainage). Both sectors are closely linked to solid waste management, as there is a widespread prevalence of littering that clogs the open drains and blocks the flow of water. This results in water logging and urban flooding during monsoons.

Some interview partners highlighted the fact that both urban and peri-urban areas need to be considered when talking about urban climate finance as especially the agricultural sector touches upon many climate-related aspects (Kamble, Rajan).



## 7.2 Municipal finance framework

### 7.2.1 Municipal governance and administration

India is a federal state with three levels of government, namely union, state and local governments. Local government consists of panchayats in rural areas and town panchayats, municipal councils, municipalities or municipal corporations in urban areas.

As stipulated in the Twelfth Schedule of the Indian Constitution (Article 243w) and the Municipal Acts, amongst others, urban local bodies (ULBs) in India are responsible for urban planning, regulation of land-use, planning for economic and social development, water supply, public health, urban forestry, slum improvement and upgrading, and poverty alleviation. Generally, municipal corporations and state capitals such as the Greater Chennai Corporation enjoy wider functions and a greater degree of fiscal autonomy than other forms of local governments and accessing central and state funds is easier.

The Greater Chennai Corporation governs the city of Chennai. Within the Corporation, the Financial Management Department prepares the overall budget and receives loans and grants from the Government. The Revenue Department is in charge for collecting taxes and the Land & Estate Department leases out land of the Corporation. The Corporation is not responsible for water management, urban planning and other urban services, as these are provided by independent boards established and administered (mainly) by different State departments. As will be shown in chapter 7.3, several State departments are involved in urban development in Chennai.

### 7.2.2 Sources of funding for municipalities

The Annual Budget presented for the Greater Chennai Corporation (2015-2016) estimates revenues at INR 2392.56 crore<sup>29</sup>. Most of it is attributed to tax revenue

and user charges as well as assigned revenue and compensation (Greater Chennai Corporation 2015).

#### Municipal own-source revenues

According to the Reserve Bank of India (2007) important revenue sources of municipal corporations in India include:

- **Taxes:** The major proportion of income of municipal corporations flows from taxes. It ranges between two-fifths and three-fourth of total income. A corporation generally has the power to levy taxes on the following: property, vehicles, animals, theatre, advertisement, profession, education, entertainment, electricity, etc. Municipalities can also charge betterment tax on increase in urban land values caused by any development or improvement work. The primary source of finances for Chennai is property taxes and commercial taxes.
- **Other revenue:** User charges, license and other municipal fees, sale and hire charges, rent from properties, tools and plants, fines and forfeitures, receipts from markets, etc.

#### National and state government transfers and grants

Other important sources of income are higher tiers of government, which allocates own resources as well as central grants to the local government (Reserve Bank of India 2007).

- **Assigned (shared) revenue:** The national and state-level governments assign certain shares of their revenues to the local level through Finance Commission grants.
- **Grants-in-aid:** Plan grants made available by way of planned transfers from the upper tier of Government under various projects, programmes and schemes. For example, State Finance Commission (SFC) grants, State Plan Grants, Central Finance Commission (CFC) grants, and Centrally Sponsored Schemes (CSS) grant. Non-plan grants are made available so as to compensate against the loss of income and some specific transfers.

<sup>29</sup> Indian Rupee is the currency in India (code: INR): US\$ 1 = INR 66.63 (10-03-2017). 1 lakh equals INR 100,000 and 1 crore equals INR 10 million



Transfers and grants often make up a very large share of municipal finance. This dependency on state and central government resources can affect the quality of public services, as municipal managers do not try their best to develop economically attractive projects and tap innovative financing sources but rather make do with the limited government funding and own-source revenues (Times of India 2017).

### Municipal borrowing and PPPs

In addition to budgetary allocations and funding schemes from higher tiers of government, investments in urban infrastructure have traditionally been supported by borrowings from state-owned institutions, such as the Housing & Urban Development Corporation Ltd. (HUDCO), Life Insurance Corporation of India (LIC), banking institutions, infrastructure finance entities and municipal development funds.

According to budget estimates for 2015-2016, Chennai Corporation needed a loan amount of INR 1.020 crore from various funding agencies, while in 2014–2015 the loan component was INR 546 crore (The Hindu 2015). This steep increase is largely caused by the need for additional capital to build urban infrastructure in the new areas that were added to the Chennai Corporation in 2011.

Recent programmes of the National Government India envisage innovative financing mechanisms, such as the delivery of urban services in partnership with the private sector through public private partnerships (PPP). Yet, unclear regulation and other issues (e.g. low credit ratings, reluctant investors) have stifled the use of new financing mechanisms. For example, since 2010, almost no municipal bonds have been issued (Chakrabarti 2014). Chennai last tried to issue a bond in 2005 but failed due to lack of interested investors (Times of India 2017).

### 7.2.3 Municipal expenditure

Chennai's Annual Budget provides details on expenditure incurred for street lighting, schools and healthcare facilities, management of solid waste, as well as maintenance of roads, parks and open spaces etc. The budget does not provide specifically for climate action.

The 2015–2016 Budget reveals a INR 1.20 crore budget deficit (Greater Chennai Corporation 2015). According to interviewed municipal experts, Chennai's revenue deficit is less critical than in other Indian cities. One potential reason for this is that the Greater Chennai Corporation does not have any expenditure responsibilities concerning water supply (Sridhar and Wan 2014). However, because of the addition of new areas, Chennai Corporation is undergoing higher expenses to provide basic urban infrastructure to these areas. Revenue, largely from property tax, has remained the same over many years. As a result there has been an increasing gap in expenditure and revenue. The Corporation expects that once the citizens in the extended areas start paying taxes on their services, the financial situation will improve (Kandasamy).

### 7.2.4 Financial reform efforts

In the discussions with the Chennai Corporation and some of the other stakeholders of the city, it became apparent that municipal financial management was greatly improved under the Jawaharlal Nehru Urban Renewal Mission (JNNURM, 2005–2014) of the Government of India. In order to be eligible for funding from this scheme, which was largely financed by the World Bank, municipalities had to undertake reforms including establishment of sound and transparent accounting and reporting procedures. This has helped to improve Chennai's creditworthiness in the eyes of other bilateral agencies. Creditworthiness and sound municipal financial management are also important aspects of the Smart Cities Mission (since 2015), in which Chennai participates.

Through property tax, parking revenues, revenues from commercial areas, and State and Central Government as well as international funding, Chennai has a relatively stable revenue stream (Jayaraman). However, there is scope (and, given rising debt levels, need) to use the available finances in a more efficient way by integrating climate action in developmental work. This scope is largely left unexplored either due to a lack of technical skills or due to a lack of willingness to proactively engage in activities that are not clearly within the municipal mandate (and there is no specific mandate for climate protection or adaptation in Chennai). As a result, available finances are not used to the fullest extent possible for climate resilience building.





## 7.3 Framework for urban climate action

### 7.3.1 Climate-related structures and strategies at the State level

In India, environmental and climate-related functions are executed by the Central and State Governments rather than by the local governments. Municipalities have little or no control over related issues. Figure 14 provides an overview of the agencies that directly or indirectly facilitate climate-smart development in the Chennai Metropolitan Area and/or Chennai City through their programmes.

- **Pollution control:** The Tamil Nadu Pollution Control Board, TNPCB (under the national Ministry

of Environment, Forests and Climate Change, MoEFCC) is responsible for developing programmes for the prevention, control, and abatement of water, air, sewage, and noise pollution. For example, it conducts the Ambient Air Quality Monitoring Programme in Chennai (TNPCB 2016).

- **Environment:** The Tamil Nadu Department of Environment is the nodal state agency engaging with all environmental aspects other than those dealt with by Tamil Nadu Pollution Control Board. For example, to improve coordination of developmental activities along the coast of Tamil Nadu, it

Figure 14: Climate change relevant authorities in Tamil Nadu and Chennai (developed from websites)

#### TAMIL NADU

Pollution Control Board

Dep. of Environment  
– TN State Climate Change Cell

Dep. of Housing and Urban Development  
– Tamil Nadu Slum Clearance Board

Dep. of Municipal Administration and  
Water Supply Management

Dep. of Transport

Dep. of Energy  
– TN Generation & Distribution Corp.  
– TN Energy Development Authority

State Disaster Management Authority

#### CHENNAI METROPOLITAN AREA

– Chennai Metropolitan  
Development Authority  
(CMDA)

– Chennai Metropolitan  
Water Supply and Sewerage  
Board (CMWSSB)

– Chennai Unified MetropolitaN  
Transport Authority  
– Metropolitan Transport  
Corporation (Chennai Division)

#### CITY OF CHENNAI

Chennai Corporation  
– CC-relevant  
Departments: Solid  
Waste Manage-  
ment, Electrical,  
Engineering, Parks,  
Buildings, Storm,  
Water Drain, etc.

Source: adelphi, developed from information provided by various departments

prepared an Integrated Coastal Zone Management Plan with a focus on risk reduction and mitigation.

- **Climate:** The Tamil Nadu State Climate Change Cell, TNSCCC (under the Tamil Nadu Dep. Of Environment) is dealing with climate change issues. Amongst other things, it is in charge of the 2015 Tamil Nadu State Action Plan on Climate Change (see box 13).

### Box 11: The Tamil Nadu State Action Plan on Climate Change

The Tamil Nadu State Action Plan on Climate Change (TNSAPCC) creates an overarching climate response framework at the State Government level. The five-year plan envisages provisional budget requirement of IRN 4.04 lakh crore for projects classified under seven key sectors, namely sustainable agriculture; water resources; forests and biodiversity; coastal area management; energy efficiency, renewable energy and solar mission; and sustainable habitat and knowledge management. The plan's vulnerability assessment also contains information on Chennai (e.g. expected rainfall patterns and temperature projections for the Chennai District) and proposes measures for the city in different sectors (e.g. coastal management: sea walls; energy: energy efficient street lighting).

The strategies and plans indicated in TNSAPCC shall be implemented by concerned line departments. All sectoral line departments are expected to set up Climate Change Cells, which will coordinate aspects of the plans' implementation in their respective sectors. However, this is yet to happen.

The Department of Environment has submitted proposals under the National Adaptation Fund for Climate Change (NAFCC) and the Green Climate Fund (GCF) for the implementation of the measures identified in the TNSAPCC. These proposals were developed in consultation with the UK Department for International Development (DFID) and India's National Bank for Agriculture and Rural Development (NABARD). Similarly, the concerned line departments are in the process of submitting proposals for consideration under NAFCC and GCF. Even though these proposals focus on the rural areas of Tamil Nadu, Chennai might be able to benefit from

the Departments' experiences with project design and application specifications.

- **Urban planning:** The Chennai Metropolitan Development Authority (CMDA), under the Tamil Nadu Housing and Urban Development Department, is the nodal planning agency and prepares the mandatory masterplans and detailed development plans for the metropolitan area. The CDMA is not directly involved in financial planning for the city of Chennai.
- **Urban development (incl. water, waste, housing):** The Municipal Administration and Water Supply Management Department is responsible for the development of urban areas (e.g. through the upgrading of housing, storm water drainage systems, roads, etc.) and for ensuring water supply (Government of Tamil Nadu 2013). One of the boards under this department is the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB), which provides water supply and sewage treatment to the city of Chennai.
- **Transport:** The Transport Department is amongst other things responsible for integrated urban transport systems that reduce GHG emissions (Government of Tamil Nadu 2008). The Department constituted the Chennai Unified Metropolitan Transport Authority (CUMTA) for the Chennai Metropolitan Area to improve urban mobility by promoting sustainable public transportation.
- **Energy:** The Tamil Nadu Generation and Distribution Corporation Limited (under the Tamil Nadu Dep. of Energy) is responsible for energy generation and distribution, including in Chennai. The Tamil Nadu Energy Development Authority, TEDA is the nodal agency for renewable energy in the state. It conducts awareness campaigns, assesses the potential of alternative energy sources, demonstrates pilot projects, etc. Moreover, it implements subsidy schemes, such as the Solar Rooftop Capital Incentive scheme, with financial support from the State Government and the Ministry of New and Renewable Energy.
- **Disaster management:** The State Government has developed a Tamil Nadu Disaster Management Policy that is implemented by the State Disaster Management Authority. The Chennai floods in recent years have amalgamated several departments



encouraging them to work together in response to the flood and also created awareness regarding the importance of natural drainage and its interactions with land use in the city. However, no funding has been allocated by the state government for implementation of the policy and till date, disaster management is still largely reactive.

### 7.3.2 Climate-related structures and strategies in Chennai

The Greater Chennai Corporation itself does not have an independent unit for climate change or environment. Among the relevant sectoral departments for climate finance are, for example, the Solid Waste Management, Parks, Buildings, Electrical and Storm Water Drain Departments. The Corporation is not primarily responsible for water management, urban planning, energy supply and transport. As mentioned, these services are managed by State Departments and their subsidiary boards for the whole of Tamil Nadu and/or Chennai Metropolitan Area.

This administrative fragmentation has implications for climate management in Chennai, as both water and urban planning need to take growing vulnerabilities into account. With climate-related responsibilities dispersed but not coordinated between these bodies (and further functions located at the State-level), concerted climate action and channelling of climate finance is difficult. Coordination between different sectors of the Corporation itself, between the Corporation and the water and planning boards, as well as between different state and city departments is limited (Joerin et al. 2014). Hence, coordinated planning and information sharing on respective budgets is also limited.

Several citywide plans and programmes guide urban development in Chennai. Yet, none of these cover the expanded areas of the Greater Chennai Corporation and are thus considered to be outdated. This acts as a major hurdle in sustainable developmental planning of the city. Moreover, these plans only indirectly provide guidance for climate-compatible development through provisions for environmental protection, disaster management, etc.

- The second **Masterplan for Chennai Metropolitan Area 2026**, prepared in 2008, is a statutory

instrument of the CMDA to control, direct, and promote present and future development of the metropolitan area with the aim to achieving maximum economic, social, environmental, and aesthetic benefits. Despite not being framed as climate-change projects, the Chennai Masterplan proposes actions such as priority lanes for bus rapid transit, prioritising non-motorised transport, encouraging compressed natural gas fuels, rainwater harvesting, building regulations for coastal-zones, protection of environmentally sensitive areas, etc. The plan does not entail investment strategies. The city is in the process of revising the Master Plan to include recently added areas in the plan.

- The Chennai **City Development Plan (Development Plan for Chennai Metropolitan Area)** was prepared in 2006 as part of the national Jawaharlal Nehru Urban Renewal Mission (JNNURM) funding application process. It was revised in 2009 and is currently undergoing another revision process (see Box 12). The plan formulates sectoral visions and develops a city investment plan with finance strategies. However, climate change is not explicitly mentioned and it is not entirely clear where the CDP should be located in the hierarchy of development plans.

#### Box 12: Revision of the Development Plan for Chennai Metropolitan Area

Chennai was the first city to undergo a review of its City Development Plan (CDP) in 2009. For the review, the Greater Chennai Corporation received assistance from the City Development Initiative for Asia (CDIA). The CDIA provided US\$ 455,128 of funding to (1) review the CDP's infrastructure investment programme, (2) conduct pre-feasibility studies for waterways improvement and solid waste management, (3) link the pre-feasibility studies with potential financiers and (4) assist the city in planning any institutional strengthening related to project programming for city service delivery. Follow up infrastructure investment to take the proposed projects to feasibility level was estimated at US\$ 400 million with the ADB, KfW, and JNNURM being the primary sources for funding (CDIA 2009).

The CDP is currently being revised again to meet the infrastructural needs following the expansion of the

Corporation area. The revised CDP is expected to focus on the severely strained transportation, water supply, sanitation and energy sectors, which affect most city residents. Climate change concerns are not directly addressed. Meetings with stakeholders have not been organised so far and the project has been delayed by over a year.

- Formulating a **Climate Change Action Plan** for Chennai failed between 2011 and 2013 due to changing political circumstances. Currently, there is no comprehensive climate change strategy.

Despite the absence of a comprehensive climate strategy, several projects are being conducted in Chennai with potential climate co-benefits, e.g. in sectors such as transport (Chennai Metro Rail Network, support of pedestrian traffic), energy (introduction of smart meters, reduction of electricity losses, etc.), waste (methane capture and power generation at sewage treatment plants), environment (greening activities to increase tree cover), storm water drainage and others. These are realised by a multitude of different implementing entities and funding agencies (see next chapter).

## 7.4 Landscape of urban climate finance in Chennai

### 7.4.1 Tracking urban climate finance flows

In India, the climate finance landscape is highly complex with a multiplicity of domestic and international institutions, actors and channels of climate finance (Jha 2014). The Economic Survey 2011–12 contained for the first time a chapter on ‘Climate Change Finance’ providing an overview of various public and private sources of finance but lacks information on the sub-national level.

There is no mechanism institutionalised at the city level to track its investments into climate related projects or the impacts of development projects on achieving state or national climate goals. Authorities in Chennai do not use the term “climate finance” and there is no explicit municipal budget for climate change projects. As a result, although there are several projects being undertaken in Chennai and other cities that contribute to climate mitigation and adaptation, there is no record of this contribution at the national level. There is thus no assessment of how much public or private money is going into climate finance.

### 7.4.2 Sources and mechanisms of urban climate finance

Interviews with stakeholders in Chennai have shown that there is quite a patchy flow of finance and no overall Climate Finance Strategy. Climate action is mainly financed through government schemes and

developmental projects that help improve basic urban services, without particular focus on climate change. Climate action is therefore, primarily a co-benefit for the cities, and Chennai is no different. However, there have been issues regarding the release of funds under many of these schemes, partly because of changes in political priorities.

#### Intergovernmental transfers and grants

Budgetary support and development schemes by the Union and State Governments are the main sources of public finance for projects with climate (co-)benefits in India and Chennai. Chennai taps the following central government schemes for projects that have potential for reducing GHG emissions, increasing water security and protection against storms and floods.

- Under the **R-APDRP Scheme** Chennai is modernising and strengthening the electrical infrastructure of the City in order to reduce electricity losses. Under the **IPDS** (Integrated Power Development Scheme) it is installing smart energy meters. Both schemes are funded primarily by the Ministry of Power, with additional funds from State Governments.
- Under the national **Smart Cities Mission** (initiated by the Prime Minister in 2015) the Chennai Corporation plans several climate-smart projects, including retrofitting of green open spaces, cycle share networks, electric rickshaws, storm water management, LED street lighting, intelligent traffic



management system and a disaster management monitoring system. The overall costs of these projects are estimated to be almost INR 1400 crore, of which two thirds will be funded from the Central and State Governments. Another significant share (INR 318 crore) is expected to be paid by private investors through PPPs with Chennai's Special Purpose Vehicle (SPV) for the Smart Cities Mission. Only a minor share of the total fund requirements will be raised through debt (Ministry of Urban Development 2016).

- Under the **Atal Mission For Rejuvenation And Urban Transformation** (AMRUT) Chennai primarily focuses on improving water and sewerage services but also on upgrading green spaces. Projects are funded to a major share by the State Government of Tamil Nadu but also by the Government of India as well as by the urban local bodies themselves.
- The **Chennai Mega City Development Mission** (CMCDM), launched by the Tamil Nadu Municipal Administration and Water Supply Department in 2011, intends to improve infrastructure and basic amenities in the expanded areas of Chennai. In consequence of recent flooding, one of the focus topics of the Mission is storm water drainage. Every year, the State Government allots nearly INR 500 crore to the Chennai Corporation and CMWSSB for the CMCDM.

Chennai certainly also uses further programmes with climate benefits that are not listed here. Other national government schemes, such as Swachh Bharat (waste management) and Housing for All, are not being used for climate-smart projects in Chennai.

Additionally, India has several specialised financial institutions that provide climate finance. Examples are the Indian Renewable Energy Development Agency (IREDA), the National Clean Energy Fund (NCEF) and the National Adaptation Fund on Climate Change (NAFCC). However, Chennai does not actively use these sources. Such funds are often disseminated to State Governments and parastatal bodies. This limits the funding available for cities to plan and integrate climate associated risks (Ginoya). The NAFCC, in turn, has only been used for rural adaptation projects, and has not yet financed any urban projects. This is primarily because its implementing entity, NABARD,

is a rural development bank that has traditionally worked with rural organisations and has only recently started funding projects in cities. Overall, there is no dedicated climate finance mechanism for cities in India.

### Multilateral and bilateral funding

According to the Climate Funds Update, India so far received US\$ 1.026 billion of multilateral climate finance (US\$ 21.22 billion for adaptation and US\$ 992.1 million for mitigation). Such international finance primarily comes on a project-to-project basis, in the form of either grants or concessional loans (Jha 2014). Usually, the Ministry of Finance (Climate Change Finance Unit) or the MoEFCC receive and coordinate international financial assistance. The World Bank, ADB, JICA, GIZ and other multi- or bilateral agencies, in turn, play key implementation roles as they often operate alongside central ministries and state governments.

The following projects in Tamil Nadu or Chennai are funded from multi- and bilateral sources:

- In 2016, India and KfW concluded a € 100 million loan to be used for the **Chennai Water Production and Demand Management Programme**. The programme, which is implemented by the CMWSSB, aims at enhancing the water production capacity in the Chennai Metropolitan Area.
- The **Chennai Metro Rail Network**, an efficient mass rapid transit system, was largely financed by the Government of Japan.
- The **Tamil Nadu Sustainable Urban Development Programme**, supported by the World Bank, aims to improve urban services delivery and reduce air and water pollution, environmental harm, etc. It provides grants and technical assistance. Under this programme, a storm water drainage project has been implemented in selected areas of the Chennai Corporation. Future changes in the frequency or intensity of storms due to climate change were not considered (Chennai Corporation 2015).
- The Urban Climate Change Resilience Trust Fund (UCCRTF) provides US\$ 1.50 billion of funding for the ADB technical assistance project **“Strengthening Smart Water Management and Urban Climate Change Resilience in Tamil**



**Nadu**” which, amongst other things, includes a study on water-related risks in the Greater Chennai Corporation as well as technical assistance to the Government of Tamil Nadu for the implementation of its recently launched Sustainable Water Security Mission (Asian Development Bank 2017).

Funding from the Adaptation Fund and GCF has been used neither by Chennai nor by any other Indian cities or metropolitan areas. NABARD is accredited as NIE with both the Adaptation Fund and the Green Climate Fund. Moreover, the National Government has nominated financial institutions like the Small Industries Development Bank of India (SIDBI), the Infrastructure Development Finance Company (IDFC) Limited and Yes Bank for accreditation to apply for international climate finance.

### Box 13: Adaptation Fund Projects in India

Presently, six Adaptation Fund projects are being implemented in India. Most have a community-based adaptation approach and focus on ecosystem resilience and livelihood security in the water and agriculture sectors (Adaptation Fund 2016). No project with an urban focus has been initiated.

One project in Andhra Pradesh is concerned with coastal management in the Krishna Delta. The project region shares certain characteristics with the Chennai Metropolitan Area as it is highly vulnerable to the predicted changes in the climatic condition and sea level rise and associated extreme events such as cyclones and floods. The main objective of the project is to overcome the impacts of sea level rise and cyclonic storms on the coastal area through appropriate adaptation strategies such as restoration of degraded mangroves. Mangroves are also a vital part of the Chennai coastline facing degradation. Chennai’s coastal management could largely benefit from linking ecosystem service restoration with disaster resilience and adaptation strategies (Greeshma and Kumar 2015).

### Clean Development Mechanism

India has been a significant beneficiary of the Clean Development Mechanism (CDM) under the Kyoto Protocol, especially in the energy sector (Ministry of

Finance 2012). The situation of CDM projects in Chennai is as follows.

- The “**methane capture and power generation at sewage treatment plants**” project by the CMWSSB started in 2011 with a crediting period of 10 years (CDM Executive Board 2006). The project activity aims to recover the methane generated from sewage treatment processes and utilise it for power generation in gas engines. According to the CMWSSB, this leads to savings in energy cost to a turn of INR 43.05 lakhs per month (CMWSSB 2016).
- Another project titled “**Energy Efficiency Measures at Desalination Plant in Chennai**” was withdrawn from the registration as CDM project primarily due to prevailing technological barriers and lacking clarity regarding energy savings calculations (CDM Executive Board 2009).
- Finally, the Tamil Nadu Generation and Distribution Corporation (TANGEDCO) has initiated action to establish the **Ennore SEZ Super Critical Thermal Power Project** at North Chennai Thermal Power Station. The project is likely to be commissioned in 2018–2019 and is listed under Prior Consideration by the CDM Executive Board.

Several Chennai-based organisations such as the Chennai Petroleum Corporation Limited and the V. S. Steel and Power Private Limited are involved in CDM projects in Tamil Nadu.

### Private finance and Public-Private Partnership (PPP)

The Ministry of Finance acknowledges that a bulk of the investment required for implementing India’s climate plans would need to come from private investment. So far, around US\$ 34 billion has been invested in total to mobilise private climate finance in India, predominantly in the energy and transport sectors. National programmes (such as the Mission on Enhanced Energy Efficiency (NMEEE) and the National Solar Mission (NSM)) and new fiscal instruments (e.g. the Bureau of Energy Efficiency’s Partial Risk Guarantee Fund (PRGF) and Venture Capital Fund for Energy Efficiency) incentivise private finance by removing key barriers. However, there are still many institutional, financial, and technical barriers for the





private sector to engage in the urban climate response (e.g. lack of policy clarity on the private sectors role; high credit risk, etc.) (GIZ 2015).

Tamil Nadu's SAPCC identifies PPP as a route to promote and develop e.g. renewable energy. For Chennai, PPPs play a crucial role in its proposal under the Smart City Mission. Further information on private capital and investments in Chennai's climate-related projects was not elicited.

Yet there are further opportunities for accessing private finance for projects with adequate risk-return profiles. For example, Banks are also becoming increasingly active in financing climate projects. For example, the Indian bank YES BANK builds its expertise and exposure to clean energy projects. YES BANK's Corporate Finance unit covers clean energy, transportation, water and waste management. The Water and Sanitation Pooled Fund has been created by the Government of Tamil Nadu to mobilise resources from the capital market. This trust would identify viable projects and fund them from concept to commissioning on a sustainable basis. The fund would make the ULB a part of the active debt markets so as to avail the best interest rates available in the market. Chennai Corporation and the parastatal bodies should watch such opportunities in order to diversify their funding sources.

### 7.4.3 Technical support for urban climate finance

The city of Chennai has joined the Rockefeller Foundation's 100 Resilient Cities network and the C40 Cities Climate Leadership Group (C40). Despite being relatively robust regarding its creditworthiness, especially in the wake of having received substantial grants from World Bank, KfW and JICA in recent years (Kandasamy), Chennai is participating in the C40's City Creditworthiness Network and receives support and guidance from international experts in order to learn how to identify financial issues and develop action plans to achieve an investment-grade credit rating.

Chennai has committed to use the CURB (Climate Action for Urban Sustainability) tool to assess investment options in climate mitigation actions. CURB was developed by the World Bank Group in partnership with the C40 Leadership Group and piloted in 2015–2016. The tool helps to prioritise the most relevant sectors for mitigation measures and identifies cost-effective ways to reduce emissions. The tool helps to calculate emission reductions associated with certain infrastructure investments and determines investment returns based on energy costs avoided. It can thus provide borrowers and lenders with 'bankability data' (The World Bank Group 2016b).

Technical assistance also comes from the state level as well as multilateral and bilateral agencies.

## 7.5 Challenges for urban climate finance

### 7.5.1 Lack of awareness and commitment

In Chennai, awareness of climate change and its impacts is often shaped by the observation of changes in local weather and climate patterns without taking the broader issue of climate change into account. This lack of understanding regarding the complexity of climate change and also its impacts on urban development often limits informed decision-making. While there is a sound understanding among academics, their lack of involvement as active stakeholders in urban planning and decision-making does not serve Chennai's city development as such.

Since climate change is still perceived as something to be happening in the distant future, planning is often not very far reaching and there is no integration in long-term development plans such as for land use, housing, water supply drainage, and waste management. Rather, a majority of climate actions in Chennai are reactive in nature and take place in the wake of natural disasters. For example, the recent Chennai floods have drawn attention to the poor urban planning that has blocked the natural drains in the city and the need to revive water bodies in the city.

Generally, there is a lack of commitment from national, state and municipal level to take action on climate change proactively and in a holistic manner. It is not

common practice for governmental staff to take action beyond their core functions, thus leading to a situation where climate-smart development might be possible but is not actively pursued due to authorities clinging to more traditional development paths. Since climate change is a cross cutting issue, several departments need to work together to develop strategic and holistic plans of actions, and this is often not possible due to a lack of cooperation among different agencies. The absence of a long planning horizon also leads to negligence in integrating climate resilience in developmental funding.

Compared to smaller municipalities, Chennai as state capital and part of a metropolitan region has much greater autonomy and is able to make independent decisions from the State Government, also in regards to climate change action. But currently, lacking political prioritisation of climate change largely impedes climate actions and related planning is rather conducted by (para)statal bodies.

### 7.5.2 Lack of local knowledge and capacity

Knowledge and capacity constraints were mentioned as a major challenge in Chennai by almost all interview partners. Especially **technical know-how** on the integration of climate change in long-term planning as well as on accessing climate funds is lacking.

Engineers, city planners and other local officials have limited technical know-how on how to integrate risks associated with climate change into future projects and programmes (Rajan, Chitra). Also technical knowledge on monitoring and evaluation of projects is lacking.

Several interviewees report on a lack of knowledge on available funds and on how to access available climate funds (Ginoya, Kamble, Kumar etc.). Moreover, the municipal staff does not have the capacity to propose projects that can be funded through the international climate funds that are available.

The lack of climate capacity is, amongst other things, based on prevailing staff policies in Chennai and India. Political pressures result in the selection of personnel to take charge of projects that are not their expertise. In other situations, staff that has been trained on climate change is transferred to other projects. This does

not allow the city to benefit from their training and expertise developed.

The private sector is also lacking sensitisation on the impacts of climate change and on how it might be affected by risks related to climate change. There is also a lack of policies (e.g. tax rebates) at the national and state level that incentivise industries to adapt climate-friendly technologies.

### 7.5.3 Inadequate institutional structures and processes

#### Coordination and cooperation

Although all departmental heads within the Chennai Corporation report to the administrative head of the Corporation, the Municipal Commissioner, there are no institutional mechanisms to bring all departments together. This is a major hindrance for the corporation to work on cross-cutting sectors like climate change (Chitra). Hence, there is no adequate cross-sectoral strategy for the integration of adaptation and mitigation measures into planning processes and no coordination of related budget. While recent floods and cyclones have compelled the different departments to come together, this is not an institutional feature and is largely in response to a disaster that has occurred.

The Corporation is also not used to working with parastatal bodies during planning of infrastructural development within the city. Feedback is taken from the Corporation regarding master planning of Chennai by the CMDA, but consistent partnership is not the general practice.

#### Planning, budgeting and monitoring

Even though consideration might be given to climate change concerns when planning new projects, financial and political factors often limit the ultimate project design (Jayaraman). In most cases, funds are restricted, so that climate concerns cannot be included in the planning stage because of higher (short-term) costs. Political interventions and priorities also determine how the climate concerns are included in project design. With climate change not addressed in higher-level documents, such as the City Development Plan or the Smart



City Mission, the potential for climate-proofing sectoral plans or individual projects is relatively low.

Local budgeting processes generally do not have specific allotments for adaptation and mitigation measures (Kamble, Ginoya, Kumar). Rather, climate actions are integrated into development activities, e.g. in the water sector. This, however, also depends on the capability (innovative thinking, awareness) of local officials to make use of the same funds efficiently.

There is no accounting mechanism institutionalised at the city level to track investments into climate projects or programmes with climate co-benefits. Hence, there is presently no approach available for Chennai to identify how much money is going into climate finance (Kamble, Venkatarami).

#### 7.5.4 Detrimental national legal and regulatory framework conditions

##### Issues with governmental transfers

Local governments are very dependent on governmental transfers from the state and national level. In the case of Chennai, interviewees perceive the transfer of loans and grants to be rather unproblematic as Chennai is a politically important area. The procedure for application, however, is bureaucratic and often associated with time delays (Chitra).

##### Centralised approval process for projects

Indian cities, including Chennai, face barriers when establishing formal city partnerships or international partnership projects due to their dependence on National and State level Governments for consent and financial support. Local bodies are not entitled to receive foreign grants directly as climate finance. If foreign funders can establish a relationship with the state government, special permissions may be sought from the state government to provide such funding at local level. Even if they receive approval for joint projects, the procedure is often associated with time delays and budget constraints (Beermann 2014).

#### Lack of national climate legislation and allocated budget

India's National Action Plan on Climate Change encourages State Governments to formulate SAPCCs and expects local governments to formulate policies and plans accordingly. But since the NAPCC is a guiding policy, this is not mandatory.

Moreover, the National Government does not specifically allocate budget for climate related projects. Even in the most recent budget, although it was mentioned that NDCs have been identified and will be implemented, there was no budget attached to it. The national Smart City Mission also fails to adequately integrate climate change and allocate budget to climate resilience building (Ginoya).

Hence, states and local governments, including Chennai, do not receive any specific climate finance to take action on climate change. Since most of the Indian states have estimated the costs of implementing SAPCC actions based on what is required for their delivery, most plans end up being "wish lists" with large funding gaps.

#### 7.5.5 (Perceived) Unfavourable economic and risk profile of climate projects

Any activity needs to be commercially attractive to be able to bring in industries. Similarly, when working with cities or governments on issues related to climate change, industries tend to focus on sectors that are profitable and help them build their revenue. For example, LED lighting, energy-efficient water pumping and waste management could potentially be lucrative sectors for industries. Mitigation is more attractive than adaptation, since it has direct and short-term monetary benefits (Venkatagiri).

#### 7.5.6 External factors influencing fiscal and financial sustainability

Governance in Chennai, including the functioning of the Corporation, receives a setback every time there is a change in the political set up in the state. It is fairly common for the political outfit that comes to power to

abandon or amend decisions that were taken and the policies promulgated by the earlier regime (IDS 2007).

### 7.5.7 Lack or inadequacy of funds and financial mechanisms

As of now, no Indian city has received funding from the Adaptation Fund on climate adaptation. On the

one hand, this is probably due to the fact that NABARD, the NIE for both funds in India, has traditionally been active in the rural sector and is only starting to build its network and expertise in cities. On the other hand, municipal stakeholders also perceive application for international funds to be very complex. Particularly adaptation projects are difficult to justify because of the broad nature of adaptation and resilience (Kamble).

## 7.6 Opportunities for urban climate finance

### 7.6.1 Capacity building for urban climate finance

#### Climate (finance) leadership

Several interviewees pointed out the need for a visionary leader for Chennai who keeps the issue of climate change in mind when making policy. Leadership is necessary to foster dialogue on climate change at city level; to mobilise climate change actions; to support local climate champions, e.g. from businesses and civil society representatives; and to reach out to other local governments for partnership (e.g. knowledge transfer on best practices) and to other levels of government. Leadership is also needed in terms of a nodal agency, department or local official which carries the responsibility for the issue of climate change in Chennai.

Climate champions should also be trained and motivated to come up with innovative business models and financing solutions for climate projects in order to find the most locally appropriate approach.

#### Capacity building for staff of relevant agencies

Awareness on climate change and sustainability issues in general but also knowledge and skills for accessing and managing urban climate finance in particular needs to be built continuously (Chitra). The municipal corporation and other parastatal agencies in the city (e.g. the water and planning boards) need to invest in capacity building, especially in mid-level management and line departments.

- **General climate-related capacities:** General information on climate change and its long-term impacts

on the city's development, resources, and livelihood generation need to be disseminated among the relevant departments and parastatal agencies (Kumar). Understanding needs to be created of the economic aspects and advantages of resilience building measures. For example, local officials need to understand the negative effects of climate change on Return of Investment (RoI) for infrastructure projects planned in climate vulnerable areas (Chitra, Ginoya).

- **Knowledge of effective climate solutions:** Technical know-how needs to be provided to sectoral departments so that they can include risks associated to climate change in future projects (Chitra). Departments also need support in finding appropriate sectoral solutions (technologies, business models) and hands-on training on how to use them (Rajan). For example, the IIT Madras has developed training modules on sanitation and water supply. Success stories from other cities should also be shared to support the city in developing its own solutions (Venkatagiri).
- **Capacity for urban (climate) finance:** Capacity building is needed for local officials so that their project proposals meet the requirements of a particular funding agency/programme (Ginoya). For example, adaptation funds under NABARD are still available and unused because there is no project proposal meeting the requirements (Chitra). After receiving funding, handling finances needs to be monitored with result oriented mechanisms.

Building capacity is sometimes problematic since municipal administrative leadership changes often in India. This reduces the incentive for leaders to build



capacities that pay off in the long-term. Hence, a continuous process rather than one-time events tend to be more successful. Municipal staff could also benefit from closer cooperation with academia, such as the IIT Madras.

### Capacity building of private sector

By sensitising industries regarding the potential impact of climate change on the profit of their businesses, they could be incentivised to create funds that support the implementation of climate projects (Saraswati). In this context, the Madras Chamber of Commerce and Industry could play an active role.

In 2011, the Chamber established the **Sustainable Chennai Forum** (SCF) with the objective of sustainable development of the Chennai Metropolitan Region in collaboration with likeminded institutions. The SCF promotes development of business cases for sustainable development in areas like Energy, Water, Waste Management, Transport and Urban Greening. For example, together with its knowledge partner, the National Institute of Urban Affairs, and with support of the UK-India Joint Network on Sustainable Cities (University of Nottingham), the SCF is planning for the establishment of a Chennai Observatory to gather social, environmental and technical data that can inform sustainable development. Climate is proposed to be one of the variables to be observed (Anand 2016).

## 7.6. Improving climate planning and financial management

### Strengthening the institutional framework for climate action

Currently, there is no public institution on the city-level responsible for climate change-related issues. Hence, a dedicated Climate Change Cell could be created within the Corporation and could be linked to national entities such as the Bureau of Energy Efficiency (BEE) or the Ministry of Environment, Forest and Climate Change (MoEFCC) (Rajagopalan).

Yet, a separate cell is costly and does not work unless integrated in the Corporation. Hence, instead of a separate cell, an existing body could be charged with coordinating Chennai's climate change response

(Kandasamy). In the Chennai Corporation, there is a Control Room, with a Special Projects Cell, that brings together all departments. In order to function as the climate focal point, the staff of the Special Projects Cell would need to be strengthened to consider climate change as part of their regular work and not only during emergencies, as is the practice now. The cell would require climate professionals so that it can work on climate change, which is lacking in the corporation at present (Kandasamy). At present this Control Room does not report to national government, and is only a part of the Chennai Corporation. If this Cell can be linked to the BEE or MoEFCC, which look after climate change at the national level, it may give direction to the Cell and support the Corporation to link climate change in their projects.

Whether established as an independent cell or integrated into an existing one, Chennai's Climate Change Cell should do the following:

- Support other departments in integrating climate concerns in their projects;
- Conduct city level vulnerability assessments to climate risks and interact with local NGOs, institutions, organisations that work on climate change so that up to date information is available with the corporation regarding climate;
- Monitor soil, air, water samples or work with other NGOs or institutions that can monitor these samples regularly. At present, this monitoring is through the Pollution Control Boards, but this is increasingly an issue since each metro city is at least 1500–2000 km<sup>2</sup> in area and requires at least 10–15 Stations to monitor air, water, and soil. This is not possible through the PCBs and needs dedicated departments that are under the control of the municipality so that the information can also be fed into municipal planning. Since the Corporation with the adjoining metropolitan region is quite large, sub-entities could be created. They should be able to monitor resources vulnerable to climate change such as water, soil and air in cooperation with local NGOs and research institutes.
- Ensure stakeholder and community engagement while planning for infrastructure development.



## Mainstreaming into all sectors

There is a need for an integrated approach towards climate change. Since there is currently no dedicated climate finance mechanism for cities in India and international funding is limited, mainstreaming climate action into other development activities and planning processes is essential (Venkataramani). Also because international funding is often restricted to pilot projects, integrating climate action into existing governmental structures and processes could facilitate their funding. For example, funding for pollution reduction, which is often easier to obtain, could be used for projects with climate co-benefits (Rajagopalan). A holistic understanding of climate change is therefore needed in order to comprehend the relevance for each sectoral department and climate-proof respective projects.

Mainstreaming is a cross-sectoral, multi-level issue, which requires action by state and non-state actors. Incentives for climate mainstreaming could come from the National Government, e.g. by including low-carbon and/or climate resilient development as key criteria for disbursement of national funds. On the other hand, Chennai can also use such funds in a climate-compatible manner even if this is not specifically stipulated.

- For example, national- and state-level funding provided under the Housing for All programme for the implementation of Chennai's Slum Free City Plan of Action can be used to build resilience through the provision of water, storm water drains, sewer lines, heat resistant buildings, etc. in slums.
- Also it was mentioned that climate change should be mainstreamed into infrastructure projects financed by multi- or bilateral funds (Ginoya). The Ministry of Urban Development (MoUD) should acknowledge climate change as a city development issue so that it can be properly integrated into service delivery and urban planning on city-level (Venkataramani).
- Disaster Management seems to have priority and specific funding for Disaster Risk Reduction is allocated in Chennai. Well-planned reconstruction and recovery efforts after natural hazards can have benefits for local resilience and reduce urban GHG emissions.

Also there is need for a coherent strategy to integrate urban climate finance into existing private and public finances. Instead of providing separate financing to climate action, it should be integrated with existing developmental projects to promote climate-proofing of cities (Kamble).

## Climate-aligned urban planning

There should be a greater acknowledgement of the intersections between urban planning and climate change. Urban planning has a major influence on climate-relevant sectors such as transport, buildings, energy, water and waste management. Urban planners have important instruments to address mitigation and adaptation through e.g. guiding spatial development and developing long-term city visions and strategies.

So far, climate change is neither adequately addressed in the Corporation's Masterplan nor in its City Development Plan. Further, it is not adequately integrated in national programmes such as the Smart City Mission. There is a particular need for creating and implementing an integrated planning approach in order to support mitigation and adaptation actions, but also to avoid planning conflicts in early stages.

Since Chennai's city boundaries were expanded in 2011, there is currently no plan covering the whole city area. An update of the present City Development Plan is being debated. In the course of a reformulation of the plan, climate change could be integrated in service delivery measures that are integral to the plan. This would support the mainstreaming of climate change actions as well as resilience building in these areas.

The city of Chennai does not have local level information on climate risks to the city. This is important to conduct a vulnerability assessment and identify their fragile urban systems that are most likely to be affected by future climate risks and contribute to future planning of the city. The IIT Madras or Anna University can provide the scientific assessment to identify the local future climate risks, conduct climate modeling, conduct vulnerability assessment and develop a resilience strategy for the city.

Urban planners should also involve private institutions and stakeholders in planning processes (Ginoya, Kamble). Community engagement in developmental



projects is important to inculcate as sense of ownership among the citizens that helps to increase the sustainability of the projects in the city (Ginoya). Also climate aspects could be integrated in the terms of reference of infrastructure projects assigned to private developers, which is currently not the case. Incentives could be given to small-scale pilot projects by private developers through e.g. allocation of land etc.

Finally, there also needs to be stricter policy enforcement. Some areas are demarcated by the present Masterplan as particularly vulnerable areas, but are nevertheless used for development projects by private individuals (Chitra).

### Budgeting and monitoring

Recently it was announced that India would start climate budgeting from 2018, to account for budgetary measures that support climate change-related actions across the country. The government will also prepare a supplementary report to go with the main budget documents accounting for how much money India is annually investing on climate change.

One of the interview partners mentioned that the State Government should leverage specialised agencies to track its investments. NABARD would be a suitable option since it is the National Implementing Entity (NIE) of the Adaptation Fund in India and is thus considered the nodal agency to disburse climate adaptation funding in cities now (Chitra). However, monitoring can also be undertaken by NGOs or community based organisations that are working on climate change. Institutions and universities can also help in monitoring the impacts of developmental projects on climate change.

### Providing incentives for public and private climate action

So far, there exist only little incentives to public and private entities to engage in climate action. One interview partner mentioned the development of coloured or numbered indices for public agencies or private businesses to mark their mitigation efforts. Public competitions, prizes and recognitions may be considered by international agencies to provide incentives. Cooperating with local media for a weekly/monthly corner to acknowledge climate actions would be another initiative.

## 7.6.3 Sourcing additional revenue and investment capital

### International (climate) finance

Several interviewees pointed out the potential to tap funds from multi- and bilateral institutions such as the Asian Development Bank, World Bank or the Japan International Cooperation Agency (JICA), Adaptation Fund and GCF (Chitra, Ginoya, Kamble). However, municipalities at present cannot access these bilateral sources of funding unless they go through the state and central government, which makes it a long-drawn process.

### Private finance and investments

It is also perceived that there is untapped potential of the private sector to participate in climate finance. Private sector's contribution could include various forms and measures such as

- One promising solution is to look at institutional investors, such as insurance companies, to provide long-term, long-cost capital needed for climate projects. Such investors could, for instance, invest into green and blue municipal bonds (Rajan).
- There are currently 94 Energy Service Companies (ESCO) in India, empaneled by the BEE. In Chennai, UVK Susnomics Engineering Private Limited, Shri Vaari Electricals Private Limited, and Swelect Energy Systems Limited are listed as ESCOs. Yet, these ESCOs tap only a small share of the market, mainly in the areas of lighting and some industrial applications (Venkatagiri). Similar players need to be brought into the market, also for sectors such as water and waste management. However, this can be done only by building business models, which are lucrative to both private players and cities (Venkatagiri).
- Additionally, Corporate Social Responsibility of different industries could be looked upon as one of the potential funds for activities related to climate change. However, demand is larger than supply and probably not enough funds could be generated through CSR (Saraswati). In addition, even though this constitutes a good opportunity, there is a need to make sure that activities under CSR correspond to the demand of the society. CSR activities should

not be politically driven or cater to the vested interest of industries (Kumar).

- Private public partnerships are also being encouraged by the central government to provide quality urban services to citizens. Return on Investment should be built into the business models to make sure that maximum private entities participate. This will also make sure that a competition is built among participating players and the best is delivered to the city. Good and timely payment model is another necessity to ensure that private players are interested in partnerships with the government agencies.

### 7.6.4 Financial intermediation through specialised financial institutions

Efforts are on their way to prepare public banking institutions, especially the State Bank of India (SBI), for providing and channelling climate finance. The Infrastructure Development Finance Company (IDFC) is also well set to finance competitive climate projects (Kamble).

Special Purpose Vehicles (SPV) could be used as a model for using climate finance that is available and to build capacity in the city to access climate finance (Jayaraman). SPVs should be looked into for parastatals. Financial intermediaries could be created that establish national- and state-level climate funds and resource planning under various national schemes such as the Jawaharlal Nehru National Urban Renewal Mission (JNNURM).

### 7.6.5 Improving the policy environment

National and state level plans and programmes related to climate change, such as the NAPCC and SAPCCs, need specific allocations of funding for climate change actions to encourage local governments to initiate actions.

As already mentioned, in order to adequately integrate climate change into service delivery and urban planning, the Ministry of Urban Development should acknowledge climate change as city development issue. Simultaneously, funds that promote other municipal activities such as solid waste management and energy generation with climate co-benefits should be tapped as they often have funding associated with them.

Currently, there is no adequate policy framework, neither on national nor on state level that provides private players with incentives to adopt more climate-friendly technologies (Kumar). For example, tax rebates could be offered to industries that conduct projects related to climate adaptation or mitigation under CSR (Kumar). Also, strategies should be developed and promoted through appropriate rules and regulations to incentivise civil society to participate in climate actions. For example, the Thane Municipal Corporation is motivating people to switch to solar heaters and rain-water harvesting through reduction in property taxes (Venkatagiri).

## 7.7 Conclusions and recommendations for Chennai

### Conclusions on the status quo and challenges for urban climate finance

- **Dispersed mandates for climate action and lack of cooperation:** Chennai Corporation does not have a climate change cell and potentially climate-relevant responsibilities are dispersed between municipal departments. Moreover, key urban functions and services, such as planning, water management and public transport, are not under jurisdiction of the Chennai Corporation but are performed by parastatal agencies. Several State Departments are also
- involved at the local level. Generally, a lack of coordination is perceived among the different governmental bodies.
- **Lack of climate change understanding and expertise:** Political leadership in Chennai is largely unaware of the complex impacts that climate change may have on urban development. As a result, project location and allocation of funding are based more on political interests than on resilience needs. Municipal staff (mainly engineers) lack the capacity to integrate climate change in developmental



programmes, identify climate financing sources and access and efficiently use available national and international funding.

- **Mitigation/adaptation as co-benefits of developmental schemes:** Chennai does not have a climate change plan. Yet, despite the lack of guidance and specific budget for climate action in Chennai, the city is implementing or planning a number of projects with positive side effects for climate protection and resilience building. These are mainly financed through national and international developmental projects that help improve basic urban services, without particular focus on climate change (e.g. the Smart Cities Mission (Government of India), Chennai Water Production and Demand Management Programme (KfW)).
- **Reliance on traditional finance:** Revenues are perceived to be good (and creditworthiness is improving, thanks to efforts taken under the JNNURM) and urban development is relatively well funded in Chennai. Yet, borrowing has significantly increased and the real need for climate finance in Chennai is unknown, as there is no tracking mechanism institutionalised at the city level. These factors make it difficult to predict whether traditional finance is sufficient to pay for growing adaptation and mitigation requirements in Chennai.

## Recommendations

### Strengthen climate change institutions and strategies

- **Consider creating a dedicated Climate Change Cell in the Chennai Corporation:** This cell should help other departments integrating climate concerns in their projects; undertake city-level climate vulnerability assessments; monitor (or coordinate monitoring of) climate-relevant data, including soil, air and water, to support the work done by the Tamil Nadu Pollution Control Board; etc. This could be an extension of the Control Room that presently brings together different departments to work on a common topic. The cell could be linked to BEE or MoEFCC.
- **Conduct vulnerability assessment:** Identify fragile urban systems that are most likely to be affected by

future climate risks and contribute to future planning of the city. A vulnerability assessment may be conducted by the Climate Change Cell, possibly in cooperation with local institutions such as the IIT Madras or Anna University, who can provide the scientific assessment to identify the local future climate risks, conduct climate modelling and conduct the vulnerability assessment.

- **Develop a climate change strategy for the city:** The climate change strategy for Chennai should indicate climate risks, identify the vulnerable areas and populations and prioritise interventions for implementation. These interventions can be integrated with development projects that the city develops so as to mainstream climate action in the city, even without specific climate financing. If climate change can be integrated into these developmental activities, it can be mainstreamed into current investments. If possible, climate vulnerabilities and GHG emissions should also be referred to in Chennai's city plans which are currently under revision. Climate change should be incorporated in the developmental planning for extended peri-urban areas of the Chennai Corporation.
- **Increase cooperation:** The National and State Government must promote the cooperation of parastatal organisations in Chennai with the Municipal Corporation. This will enable the Municipal Corporation to integrate their project activities with the broader programmes of the state government that are implemented through the parastatal organisations.
- **Identify sources of climate finance:** Both governmental and international sources should be catalogued. Financial institutions can help to apply for financing to international organisations by developing suitable proposals and procuring funds.

### Climate capacity development

- **Foster municipal capacity building:** The Chennai Corporation and the other agencies involved in Chennai need to build staff capacity on climate change (basic concepts, impact and risk assessments, effective mitigation and adaptation measures, climate co-benefits of development projects, effect of increased energy and resource efficiency on

operating costs, etc.) and climate financing (available funding avenues, application requirements). Bilateral organisations can play important roles in developing training modules and providing training and capacity building for municipal staff. Also, resourceful personnel, such as hydrology or climatology experts, can be involved in the Corporation that currently consists of primarily engineers. This would help to integrate climate concerns in development work that is undertaken in the city.

- **Foster private sector capacity building and engagement:** Apart from government funding, private capital needs to be tapped into. Companies or industries should be encouraged to contribute to GHG emission reduction by making financial and tangible inputs through their Corporate Social Responsibility funding. The Madras Chamber of Commerce can play an active role in building capacity of industrial and commercial sector in Chennai. They need to be sensitised by informing them regarding the risks posed by climate change to industrial profits. Building this understanding will help the industries to come together, connect and build funds that can help to implement climate change projects. Tax rebates for industries conducting projects related to climate adaptation under CSR can be a possible incentive. But this needs serious monitoring and evaluation of all these actions. RoI should be built into the business models to make sure that maximum private entities participate.

### **Improving climate finance at the level of the National and State Governments**

- **Assign dedicated climate finance:** It is important to assess how robust the NAPCC and SAPCCs are. These need specific allocation of funding to encourage cities to take climate action.
- **Mainstreaming of climate change:** Mainstreaming climate into development finance would also allow using the available funding more effectively. If climate change can be integrated with central government schemes like Smart Cities, AMRUT, Housing for All, Swachh Bharat Mission and others, it would enable cities to allocate finance to climate specific action through these funds and this will encourage integration and mainstreaming of climate action in development projects.





## 8. Conclusions and recommendations

The literature review and case studies show that challenges for urban climate finance are based on fundamental issues with **climate-smart development** (*How does climate change affect cities and what can cities do to reduce greenhouse gases and build resilience?*) and with the establishment of **governance frameworks** that stimulate effective local climate action (*How can horizontal and vertical cooperation and coordination be strengthened to allow for climate mainstreaming? How can long-term strategic planning be achieved? How can the participation of the private sector in climate-smart urban change be increased?*). These underlying issues need to be addressed in order to increase access

to (international) climate finance and foster sound management of urban climate finance.

At the same time, research results illustrate that challenges are also related more specifically to **urban climate finance**. Hurdles include, for example, the identification and prioritisation of climate finance sources that fit to the local context; efficient writing of high quality funding proposals in cooperation with National Implementing Entities; climate finance tracking and impact measurement; etc.

In the following, the most important conclusions will be summarised in more detail and with specific reference to the three case studies.

### 8.1 Lack of awareness, political priority and capacity: Linking climate change to the quality of life in cities

In **Santiago** and **Chennai**, awareness for climate change is considered to be relatively low among citizens, municipal administrative staff and policy makers, except in situations of acute climatic stress (flooding, drought, etc.). In **eThekweni**, awareness and skills are very good within certain departments, but less established within others. In any case, people tend to underestimate the costs of inaction versus potential co-benefits of climate smart development (e.g. cost savings, contribution to poverty reduction and health) because they are very long term – well beyond the next election – and difficult to measure or quantify. It is hard to justify expenses for climate action when there are more immediately urgent problems, such as unemployment, health issues and violence.

Yet, it was also confirmed during expert interviews that climate change mitigation and adaptation can contribute to solving many pressing issues that characterise urban areas, such as poverty, air contamination, water scarcity, etc. **All three case studies** show that it is highly important to illustrate how climate change action is

interrelated with urban development and delivery of urban services. When climate projects are framed as contributing to local wellbeing and co-benefits are clearly outlined, not only overall support for implementing climate activities will increase but also the prospects of getting access to international climate finance (e.g. through the GCF).

However, as a key prerequisite, climate projects have to be based in sound research and analysis. Particularly in **eThekweni**, where awareness and political commitment for climate action is relatively more advanced than in the other two cities, a major bottleneck is uncertainty of the socio-economic effects of mitigation and adaptation, for instance in regard to employment impacts. Improvements in this regard can also contribute to increased climate finance readiness.

Even if awareness of climate change is prevalent, municipal staff often lack the required skills for assessing the effects of climate change on their services or industries; developing sound projects that allow them to fulfil their service mandates in the most climate-friendly

and resilient manner; adapt proposals to the requirements of funding sources; etc. in **Chennai**, for example, most municipal positions are taken by civil engineers who lack understanding of climate change. In this context, capacity building is required across a large range of topics, from the most basic concepts of climate change to the development and marketing of climate projects.

Finally, lack of capacity can also be due to general understaffing of departments and high turnover of staff. In **eThekwin**i it became particularly clear that many of the departments with large potential impacts on urban GHG emissions and climate resilience have too few staff to allow for sound scientific analyses of future climate risks and time-consuming applications to multi- and bilateral climate funds.

### Recommendations

- **Municipal governments:** Assess and widely communicate long-term socio-economic impacts of climate change. This will create buy-in of citizens and

governmental departments, increase demand for climate-smart development, urban services and infrastructures and help justify the costs of climate action. Such analyses should be conducted with support from academia.

- **Municipal governments:** Invest into capacity building, starting off with climate risk assessments and then moving on to more climate-finance specific topics, such as climate-sensitive cost-benefit analysis for project prioritisation and/or investment criteria of the available funding sources.
- **Development cooperation community and NGOs:** Support capacity building, especially of urban climate champions, across all departments. Departments that are already involved in climate action need capacity building on the different forms of and access modes to climate finance. Other departments most likely require help in identifying the impacts of climate change on their services or industry branch and reflecting these in adequate project proposals.

## 8.2 Weak institutional structures for low-carbon, resilient development: Fostering cooperation

Interviewed experts across **all three cities** agree that the positive effects of mitigative and adaptive activities on urban life can be substantially increased if climate change is mainstreamed into all urban sectors. Mainstreaming climate change is also central to increasing the allocation of domestic funding to climate action as development plans drive budget allocations. This is particularly important given the observation that, today, dedicated climate finance makes up only a small part (or, in the case of **Santiago**, almost no part) of funding for urban areas whereas general urban development finance is perceived to hold larger potential for climate-smart development.

Yet, the institutional framework is often not conducive for mainstreaming climate change:

- In **eThekwin**i, the departments/units for environment, energy, water and disaster management are actively involved in shaping climate projects. However, other important departments, such as urban planning, transport and electricity, do not generally

consider climate risks. Cross-sectoral coordination spaces are not currently prevalent, but political will was shown to provide for such a platform (in the form of the Climate Change Committee, CCC).

- In **Santiago**, municipalities are held accountable for planning and sustainable development but cooperation between municipalities is sporadic and uncoordinated. The REGO of the MRS does not (yet) have the power to coordinate climate action. The national ministries cooperate with municipalities on certain matters but do not align their initiatives or foster cross-sectoral work. Moreover, key urban services (water, electricity, telecommunication, road transport) are delivered by private companies, thus reducing municipal functions in these sectors to planning and oversight.
- In **Chennai**, climate change is primarily addressed by the State Government rather than the Chennai Corporation. Key functions, such as water management and urban planning, are held by parastatal



bodies. Coordination and cooperation on climate-relevant activities are limited.

Interviews have shown that both horizontal and vertical cooperation need to be strengthened in order to speed up mainstreaming and align priorities:

- Horizontal cooperation between sectoral departments and governments is critical for mainstreaming climate change into the urban agenda, thereby making sure that available financial resources are used as effectively as possible. Horizontal cooperation can be fostered by establishing platforms for exchange, such as is planned in **eThekweni** (CCC) and **Santiago** (MRS CORECC), or by appointing dedicated climate cells that monitor and manage cross-sectoral activities (as proposed for **Chennai**). These platforms can coordinate a coherent overall approach to climate and improve climate finance readiness, e.g. through strengthening climate-relevant planning capacities.
- Vertical cooperation between levels of government helps to ensure alignment between priorities, adequacy of national funding mechanisms and reduction of policy-related barriers. In **eThekweni**, cooperation is prevalent only in a few cases, for example in the piloting of the National Climate Change Monitoring and Evaluation (M&E) Framework. In **Santiago**, national ministries cooperate with selected municipalities. Cooperation at the level of the MRS, namely between municipalities and the REGO, is hampered by the REGO's lack

of power and functions. In **Chennai**, cooperation between the different municipal and (para)statal government bodies is also limited.

## Recommendations

- **Municipal governments:** Foster cooperation between departments in order to make sure that climate factors are considered in the development and financial planning of new projects. Such cooperation can start off informal and later on become formalised through climate change working groups or dedicated climate cells.
- **Higher-level governments:** Increase cooperation with local governments and municipal networks to make sure that climate (finance) strategies and frameworks are aligned. Such cooperation can go beyond information exchange and take the form of action partnerships, e.g. for testing national monitoring and evaluation frameworks on the local level. Moreover, national governments should make sure to be informed about urban contributions to national climate targets.
- **Development cooperation community and NGOs:** Provide technical assistance for the establishment of climate change working groups (or dedicated climate institutions, where appropriate). Particularly local NGOs could also become regular members of such working groups and provide specific services that cannot be delivered by municipal departments.

## 8.3 Lack of processes and tools for climate finance: Investing in strategic planning for climate change

Strategic planning is an important topic in **all three case study cities**. Experts agree that dedicated climate change strategies and action plans are important to provide overall objectives and determine priorities for climate change mainstreaming in cities. This is also essential for providing the climate finance resources needed to start implementation. While **eThekweni** already has a climate change plan that is currently being operationalised, interviewed experts recommend that mitigation and adaptation plans be compiled for **Santiago** and **Chennai**.

Based on such a city-wide vision, all sectors should be encouraged to evaluate their planning instruments and take necessary amendments where programmes would increase vulnerability to climate change or GHG emissions (considering that this is more easily justifiable where it also contributes to local socio-economic development). Changed priorities also need to be reflected in the corresponding implementation and investment plans.

Interviews have shown that climate-smart planning needs to be long-term, going beyond political terms of office. Such planning involves assessing the costs of

inaction and comparing them to the costs and benefits of low-carbon, climate-resilient development. In this way, also bankable projects for an overall project pipeline can be designed which help to prioritise climate action and to access international funding. Yet, climate assessment and planning is hampered by several factors, including uncertainty of climate change and lack of skills, tools and data. It is thus suggested to increase cooperation with development cooperation agencies, universities and NGOs.

At the same time, it is important that national- and state-level climate (investment) strategies also act as impetus and guidance for municipalities to take action. In **Chennai**, it was particularly highlighted that both National and State Action Plans on Climate Change do not have specific budgets allocated to them and are also not mandatory, hence failing to trigger local action.

## 8.4 (Possibly) Inadequate use of available funding: Strengthen monitoring, reporting and verification

Neither **Santiago** nor **Chennai** track climate finance and its impacts. Information on projects with benefits for mitigation or adaptation is dispersed among the different authorities, which do not usually assess or categorise their projects by climate indicators. In **eThekwin**, the National Treasury keeps track of climate finance but does not publish such information. Consequently, the costs and benefits of climate projects remain unknown to most stakeholders, including national governments.

Without such data, it cannot be measured how effectively the available finance is being used. Moreover, it cannot be illustrated how low-carbon and resilient development in urban areas contributes to achieving national climate-related commitments and, hence, higher-level governments lack the necessary incentive to transfer technical and financial support to the local level. Lack of transparent climate finance tracking is also a barrier for access to international climate finance, which is usually granted based on an assessment of the (expected) climate-related impacts.

### Recommendations

- **Municipal governments:** Develop a citywide climate change strategy and make provisions for mainstreaming key priorities into sectoral strategies and urban planning. Where no climate focal point exists, the strategy should be developed by a multi-disciplinary working group with support from academia and NGOs.
- **Higher-level governments:** Assess whether national climate strategies are conducive for climate action (Do they stimulate urban climate action? Are they accompanied by adequate budgets?).
- **Development cooperation community and NGOs:** Provide technical assistance for the development of climate change strategies.

It is concluded that transparent tracking of climate finance and monitoring, reporting and verification of climate action need to be strengthened to illustrate the net present value of long-term climate projects and to justify expenses before citizens, higher levels of government and donors. The government of South Africa is taking an advance in that regard by involving **eThekwin** in the development of its National Climate Change Monitoring & Evaluation Framework.

### Recommendations

- **Municipal governments:** Invest into tracking of transparent (climate) finance and sound monitoring, reporting and verification of its impacts. Such tracking and monitoring does not have to be limited to climate finance as this is expected to be mainstreamed into regular development finance for municipalities. Rather, all investment plans should routinely be assessed their contribution to climate change mitigation and adaptation.



## 8.5 Low relevance of international finance: Making good use of domestic public finance

It was noted that international climate finance for municipalities and metropolitan areas has so far been insignificant (**Santiago**) or ad-hoc and limited to specific sectors (**eThekweni**, **Chennai**). Given the need for steady funding for municipal service delivery and the tendency towards mainstreaming of climate risks across all sectors, municipal revenues and intergovernmental transfers are considered more important instruments for climate action in cities.

Both in **Santiago** and in **Chennai**, the opinion prevails among many of the interviewed experts that once climate change is mainstreamed into development priorities and capacities are strengthened, funding for climate-compatible development can be made available from “regular” development funds. If this can be achieved, the argument for additional finance for climate change is no longer necessary or feasible. Yet, this belief in traditional finance instruments could also be due to the fact that in both cities, higher-level government bodies play important roles in funding and guiding urban development. Hence, responsibility for obtaining the required funding is partly shifted to them, (seemingly) reducing the pressure for cities to develop new approaches to (climate) financing. Additional municipal revenue mechanisms, such as new taxes or charges, currently do not seem to be considered by either city.

**eThekweni** is more directly responsible for taking and financing climate action itself. Concern was voiced that the traditional municipal revenue model (which heavily depends on sale of electricity and water) is threatened by reduced demand for energy (due to economic decline and increasing use of small-scale decentralised energy) and reduced availability of water (persistent drought

conditions). Such shifts in the sources of municipal revenues need to be tracked so as to inform future revenue modelling and budgeting processes. It was also mentioned that intergovernmental transfers and grants have to be improved, as few specifically consider climate change among their criteria.

Similar considerations will likely become more relevant for the other two cities as the climate and, with it, the available resource base and economic patterns change. Against this background it is extremely important that urban governments make the best use of the available domestic public finance and plan ahead for changes in revenues or governmental transfers. Yet, national regulation often limits municipal autonomy in regard to raising revenue (e.g. through limitations to tax rates in **eThekweni**) or taking debt (e.g. municipalities in **Santiago** are not allowed to take debt except through the ministries). Lack of skills and financial management instruments also hamper sound financial management.

### Recommendations

- **Municipal governments:** Assess which funding sources are most essential for urban climate action and how their availability will be affected (e.g. by climate change) in the future.
- **Higher-level governments:** Assess whether policy and regulatory frameworks are conducive for urban climate finance. Relevant frameworks here include intergovernmental transfers (Do they take climate factors into account?) and municipal regulation (*Does it allow for experimenting with new financing opportunities? Does it impede partnerships with potential international partners?*).



## 8.6 Limited access to international climate finance: Increasing knowledge at the local level

Despite the presently stronger focus on domestic public finance, experts consider international climate finance to be very helpful in funding pilot activities and boosting climate change awareness. However, several challenges impede access to such funds.

Awareness and knowledge of the funding opportunities are generally low among municipal managers, particularly in sectors other than environment and energy. Interview partners in **eThekweni**, **Santiago** and **Chennai** voiced the need for a compendium or inventory of funding sources, including information on target sectors, eligibility and investment criteria, etc.

Further challenges are related to the conceptual development, prioritisation and marketing of project proposals that match the requirements of international funding sources. As was noted in **all three cities**, this issue is more pressing for adaptation, as here the “additionality” over regular development projects is difficult to demonstrate. International finance for adaptation is thus perceived to be more difficult to obtain. While in **eThekweni** a proposal to the GCF is being developed, none of the three cities have taken efforts to apply for funding from the Adaptation Fund. However, as other examples in South Africa illustrate, in principal the partnering with the respective NIE is possible to gain access to this source. At the same time, application to international climate funds is often a lengthy and resource-intensive process that can exceed the time budget of municipal staff (particularly if projects have to be sanctioned within specific legislative terms) and raises questions on the costs and benefits of accessing such funding sources.

In **Santiago** (and possibly also in **Chennai**), another prominent challenge to increasing use of international climate finance is the language barrier. Many terms and concepts of international climate finance are very complex, a fact that is aggravated by a relatively low proficiency in English.

Such awareness and skills-related issues can be eased by increasing cooperation with national specialised financial institutions (particularly the national implementing entities), development cooperation agencies and other national stakeholders. Meanwhile, capacity building is required to anchor knowledge at the municipal level and to empower municipal stakeholders to engage in meaningful discussions with (inter)national policymakers and financial institutions.

### Recommendations

- **Municipal governments:** Exchange information on successful project proposals with other cities, possibly from other (but similar) countries. Become engaged with the national implementing entity (or entities) and sound out opportunities for the collaborative development of a funding proposal.
- **Development cooperation community and NGOs:** Facilitate cooperation between municipalities and national implementing entities to increase access to international climate finance. Develop guidance for municipalities that helps them apply for funding, including compendia of locally relevant sources of climate finance and their investment criteria.



## 8.7 Lack of private engagement and finance: Creating attractive projects and other incentives

The private sector can contribute to climate-smart development of cities in two ways – while commercial banks and institutional or private investors can provide finance for a municipality's projects (through loans and bonds), private companies (especially utilities) can design, finance and implement climate projects themselves. The latter is particularly relevant in **Santiago**, where private utility companies are in charge of many urban services, including water, electricity, telecommunication and road transport. Despite this potential, in **all three cities** it is noted that the private sector is not really involved in climate-compatible urban development yet.

While a municipality's creditworthiness is probably an important signal for private lenders and investors, the business model behind the measure to be funded has proven to be more crucial in the decision-making process. One of the most prominent bottlenecks for the private sector to become active is thus that many urban climate projects do not generate stable revenues. This was particularly highlighted in **Santiago**. In **Chennai**, it was suggested that measures with low returns could partly be funded by private players as Corporate Social Responsibility measures (even though such funds would certainly cover only small shares of the total required mitigation and adaptation expenses).

Commercial banks currently still focus their green finance activities mostly on the development of renewable energy by private companies. This is partly based in the fact that municipal borrowing is strictly regulated. In **Santiago**, municipalities can only take up debt through the national ministries. In **eThekweni**, borrowing has to comply with a number of regulations specified in the Municipal Finance Management Act and other legislation and, in case of international loans, requires approval from the Minister of Finance. In both cases, borrowing is linked to lengthy approval processes that reduce attractiveness of debt funding.

Where the private sector rather than municipalities are in charge of delivering urban services, municipal governments have to use their (financial) powers to stimulate climate-compatible development, e.g. by raising awareness, compiling best practice case studies that illustrate the business case of climate action or by establishing price mechanisms to charge for negative externalities. National governments would also have to contribute to creating enabling legal and investment frameworks.

### Recommendations

- **Municipal governments:** Engage the private sector in climate action, e.g. by illustrating the effects of climate change on industries and by highlighting best practice examples of climate projects with good return on investment. Projects with sound business models can be realised with financial support of private banks (borrowing) or private project developers (through PPPs).
- **Higher-level governments:** Gear up efforts to establish disincentives for behaviour that increase GHG emissions or climate vulnerability, thereby improving the attractiveness of climate-aligned projects and stimulating a private response to climate change.

## 9. Bibliography

- ACEEE 2012: On-bill financing for energy efficiency improvements.
- Adaptation Fund 2015: Annex 1: Strategic priorities, policies and guidelines of the Adaptation Fund Adopted by the CMP.
- AdaptChile 2015: Financiamiento Climático para Santiago: ¿Cómo vamos?
- AFD 2016: AFD in South Africa. Retrieved 12 Feb 2017, from <http://www.afd.fr/lang/en/home/pays/afrique/geo-afri/afrique-du-sud/AFD-AfriqueduSud>.
- Afesis Corplan 2013: Land and Settlement Development Research Study – Report on Municipal Planning.
- African Markets 2015: IFC issues landmark green bond on Johannesburg Stock Exchange. Retrieved 01 Nov 2017, from <https://www.african-markets.com/en/stock-markets/jse/ifc-issues-landmark-green-bond-on-johannesburg-stock-exchange>.
- Anand, Suchith 2016: Reflections from UK-India Joint Network on Sustainable Cities and Urbanisation in India “City level workshop on Chennai Urban Observatory” 9th -10th Nov 2016, Chennai, India. Retrieved 19 Mar 2017, from <http://opensourcegeospatial.icaci.org/2016/11/reflections-from-uk-india-joint-network-on-sustainable-cities-and-urbanisation-in-india-city-level-workshop-on-chennai-urban-observatory-9th-10th-nov-2016-chennai-india/>.
- Andersson, Mats 2014: Metropolitan Governance and Finance: Municipal Finances: A Handbook for Local Governments. Washington DC: The World Bank.
- Ashford, Michael 2015: Does the Paris Agreement Mark the End of Additionality in Climate Finance? Retrieved 01 Feb 2017, from <https://www.linkedin.com/pulse/does-paris-agreement-mark-end-additionality-climate-finance-ashford>.
- Asian Development Bank 2017: India: Strengthening Climate Change Resilience in Urban India. Retrieved 02 Mar 2017, from <https://www.adb.org/projects/49106-002/main#project-pds>.
- Baer, Madeline 2014: Private Water, Public Good. Water Privatization and State Capacity in Chile. In: *Studies in Comparative International Development* 49:2, pp 141–167.
- Barnard, Sam 2015: Climate finance for cities. How can international climate funds best support low-carbon and climate resilient urban development?: Overseas Development Institute.
- Beermann, Jan 2014: Urban partnerships in low-carbon development: opportunities and challenges of an emerging trend in global climate politics. In: *UrBE – rev Bras Gestão Urbana* 6:541, pp 170–183.
- Beermann, Jan; Appukuttan Damodaran; Kirsten Jørgensen and Miranda A. Schreurs 2016: Climate action in Indian cities. an emerging research area. In: *Journal of Integrative Environmental Sciences* 13:1, pp 55–66.
- Bikesantiago 2017: Qué es Bikesantiago? Retrieved 16 Feb 2017, from <http://www.bikesantiago.cl/>.
- Bloomberg, Michael R. 2014: Advancing climate ambition: Cities as partners in global climate action.
- British Embassy Santiago 2012: Santiago Transport Green Zone.
- Buchner, Barbara K.; Chiara Trabacchi; Federico Mazza; Dario Abramskiehn and David Wang 2015: *Global Landscape of Climate Finance 2015: Climate Policy Initiative*.
- Business News Americas 2014: Banco BICE. Retrieved 23 Feb 2017, from <http://www.bnamericas.com/company-profile/en/banco-bice-banco-bice>.
- C40 Cities Climate Leadership Group 2016: *Call For Action On Municipal Infrastructure Finance*.
- Camara de Diputados de Chile 2017: *Proyectos de Ley*.
- Canales Trujillo, Nella; Charlene Watson; Alice Caravani; Sam Barnard and Smita Nakhoda 2015: *Climate Finance Thematic Briefing: Adaptation Finance: Overseas Development Institute*.



- CCFLA 2015: State of City Climate Finance 2015. New York: Cities Climate Finance Leadership Alliance (CCFLA).
- CDIA Asia 2009: Chennai Project Overview: Asian Development Bank.
- CDM Executive Board 2006: Methane capture and power generation at sewage treatment plants: CDM-SSC-PDD.
- CDM Executive Board 2009: Energy Efficiency Measures at Desalination Plant in Chennai. Retrieved 22 Feb 2017, from <http://cdm.unfccc.int/Projects/DB/SGS-UKL1235136535.54/history>.
- Census Organization of India 2011: Census 2011: Census Organization of India.
- Chakrabarti, Manas 2014: THE ROLE OF MUNICIPAL BOND MARKET FOR FINANCING URBAN INFRASTRUCTURE IN INDIA: AN EMPIRICAL ASSESSMENT (Abhinav National Monthly Refereed Journal of Research in Commerce and Management,
- Chennai Corporation 2015: Tamil Nadu Sustainable Urban Development Project (TNSUDP). Storm Water Drainage Project for the Selected Areas of Chennai Corporation.
- Chicago Infrastructure Trust 2017: Chicago Infrastructure Trust. Retrieved 31 Jan 2017, from <http://chicago-infrastructure.org/>.
- Chicago Tribune 2015: Frustrated Emanuel takes second crack at infrastructure trust. Retrieved 31 Jan 2017, from <http://www.chicagotribune.com/news/local/politics/ct-rahm-emanuel-chicago-infrastructure-trust-met-0814-20150814-story.html>.
- Cities Support Programme 2016: eThekwini. Retrieved 17 Jan 2017, from [https://csp.treasury.gov.za/Resource%20\\_Centre/Cities/Pages/eThekwini.aspx](https://csp.treasury.gov.za/Resource%20_Centre/Cities/Pages/eThekwini.aspx).
- City of Johannesburg 2014: The City of Johannesburg issues the first ever JSE listed Green Bond. Retrieved 01 Nov 2017, from [http://www.joburg.org.za/index.php?option=com\\_content&view=article&id=9073:04062014-the-city-of-johannesburg-issues-the-first-ever-jse-listed-green-bond-&catid=217:press-releases-2013&Itemid=114](http://www.joburg.org.za/index.php?option=com_content&view=article&id=9073:04062014-the-city-of-johannesburg-issues-the-first-ever-jse-listed-green-bond-&catid=217:press-releases-2013&Itemid=114).
- Climate-ADAPT 2016: Ghent crowdfunding platform realising climate change adaptation through urban greening (2016). Retrieved 10 Jan 2017, from <http://climate-adapt.eea.europa.eu/metadata/case-studies/ghent-crowdfunding-platform-realising-climate-change-adaptation-through-urban-greening>.
- CMSSC 2014: PLAN NACIONAL DE ADAPTACIÓN AL CAMBIO CLIMÁTICO – Elaborado en el marco del Plan de Acción Nacional de Cambio Climático: Council of Ministers for Sustainability and Climate Change.
- CMWSSB 2016: Sewerage Systems. Retrieved 07 Feb 2017, from <http://www.chennaietrowater.tn.nic.in/seweragesystem.html>.
- Cochran, Ian; Romain Hubert; Virginie Marchal and Robert Youngman 2014: Public Financial Institutions and the Low-carbon Transition: Five Case Studies on Low-Carbon Infrastructure and Project Investment (OECD Environment Working Papers, No. 72: OECD Publishing.
- Department of Economic and Social Affairs 2014: World Urbanization Prospects – 2014 Revision.
- Deuskar, Chandan and Benjamin Stewart 2016: Measuring Global Urbanization using a Standard Definition of Urban Areas: Analysis of Preliminary Results: World Bank.
- Environmental Finance 2014: Johannesburg taps green bond market. Retrieved 01 Nov 2017, from <https://www.environmental-finance.com/content/news/johannesburg-taps-green-bond-market.html>.
- EPCPD and Energy Office 2014: Durban Climate Change Strategy: Environmental Planning and Climate Protection Department (EPCPD); Energy Office.
- eThekwini Municipality 2014/15: Durban Climate Change Strategy. Retrieved 04 Jan 2017, from [http://www.durban.gov.za/City\\_Services/development\\_planning\\_management/environmental\\_planning\\_climate\\_protection/Projects/Pages/Development-of-a-Climate-Change-Adaptation-and-Mitigation-Strategy.aspx](http://www.durban.gov.za/City_Services/development_planning_management/environmental_planning_climate_protection/Projects/Pages/Development-of-a-Climate-Change-Adaptation-and-Mitigation-Strategy.aspx).
- eThekwini Municipality 2015: 2015/16 IDP.

- eThekweni Municipality 2016: Buffelsdraai Community Reforestation Project. Retrieved 09 Jan 2017, from [http://www.durban.gov.za/City\\_Services/development\\_planning\\_management/environmental\\_planning\\_climate\\_protection/Projects/Pages/Buffelsdraai-Community-Reforestation-Project.aspx](http://www.durban.gov.za/City_Services/development_planning_management/environmental_planning_climate_protection/Projects/Pages/Buffelsdraai-Community-Reforestation-Project.aspx).
- European Parliament 2015: South Africa: An economic powerhouse in decline.
- Falconer, Angela; Stadelmann and Martin 2014: What is climate finance? Definitions to improve tracking and scale up climate finance. A CPI Brief: Climate Policy Initiative.
- Ferrando, Francisco 2008: Santiago de Chile: antecedentes demográficos, expansión urbana y conflictos: Departamento de Geografía de la Facultad de Arquitectura y Urbanismo de la Universidad de Chile.
- FINDETER 2016: Financial Products. Retrieved 13 Jan 2017, from [http://www.findeter.gov.co/english/publicaciones/about\\_us\\_1\\_pub](http://www.findeter.gov.co/english/publicaciones/about_us_1_pub).
- Fox, William F. 2014: Structuring service delivery in small urban areas.
- Fundación Chile 2015: LOCAL ENERGY STRATEGIES: PROMOTING NON CONVENTIONAL ENERGY RESOURCES AT A NATIONAL LEVEL. Retrieved 10 Jan 2017, from <http://fch.cl/en/local-energy-strategies-promoting-non-conventional-energy-resources-ncre-at-a-national-level/>.
- Fundación Terram 2016: Chile: Agencia de Cambio Climático y Sustentabilidad comenzará a operar el 1 de enero de 2017. Retrieved 10 Jan 2017, from <http://www.cambioclimaticochile.cl/agencia-de-cambio-climatico-y-sustentabilidad-comenzara-a-operar-el-1-de-enero-de-2017/>.
- GFLAC 2015: Financiamiento Internacional para el cambio climático en Chile.
- GIZ 2015: The Role of the Private Sector to Scale Up Climate Finance in India.
- GIZ and ADB 2015: Introduction to Congestion Charging – A Guide for Practitioners in Developing Cities.
- Gobierno de Chile 2015: Contribucion Nacional Tentativa (INDC) de Chile para el Acuerdo Climatico Paris 2015.
- Gobierno del Distrito Federal 2010: Acuerdo Por el que se constituye la comisión interinstitucional de cambio climático del distrito federal.
- Gobierno del Distrito Federal; Secretaria del Medio Ambiente; Planeación y Coordinación de Políticas and Dirección de Cambio Climático 2014: Programa de Acción Climatica Ciudad de Mexico 2014-2010.
- Gobierno Regional Metropolitano de Santiago 2014: Estrategia regional de desarrollo 2012—2021.
- Godfrey, Nick and Xiao Zhao 2016: Financing the Urban Transition for Sustainable Development: Better Finance for Better Cities. Contributing paper for The Sustainable Infrastructure Imperative: Financing for Better Growth and Development.: New Climate Economy.
- Government of Tamil Nadu 2008: Policy note for the Year 2008-2009: Transport Department.
- Government of Tamil Nadu 2013: Policy Note 2013–2014: Municipal Administration and Water Supply Department.
- Government of Tamil Nadu 2015: Tamil Nadu State Action Plan on Climate Change: Government of Tamil Nadu, Department of Environment.
- Greater Chennai Corporation 2008: About Greater Chennai Corporation. Retrieved 02 Feb 2017, from <http://www.chennaicorporation.gov.in/about-chennai-corporation/aboutCOC.htm>.
- Greater Chennai Corporation 2015: Budget 2015–2016. Income and Expenditure and Balance Sheet-31-May 2015.
- Green Climate Fund 2014: Decisions of the Board – Seventh Meeting of the Board, 18-21 May 2014.
- Green Climate Fund 2015a: Concept Note User's Guide.
- Green Climate Fund 2015b: Decisions of the Board – Ninth Meeting of the Board, 24–26 March 2015.
- Hemraj, Sharlin 2014: Review of green economy and climate finance: Overview of South Africa's Key National Initiatives. Retrieved 26 Oct 2016, from [https://www.gtac.gov.za/Whatsupeditions/Edition\\_2\\_2014\\_files\\_/Review-of-Green-Economy-and-Climate-Finance.pdf](https://www.gtac.gov.za/Whatsupeditions/Edition_2_2014_files_/Review-of-Green-Economy-and-Climate-Finance.pdf).





- ICLEI 2012: EThekwini (Durban), South Africa – A municipality's climate protection program.
- Instituto Nacional de Estadísticas 2005: Chile: Ciudades, pueblos, aldeas y caseríos: Instituto Nacional de Estadísticas.
- Instituto Nacional de Estadísticas 2013: País y Regiones Total: Actualización Población 2002–2012 y Proyecciones 2013–2020. Retrieved 09 Jan 2017, from [http://www.ine.cl/canales/chile\\_estadistico/familias/demograficas\\_vitales.php](http://www.ine.cl/canales/chile_estadistico/familias/demograficas_vitales.php).
- Instituto Nacional de Estadísticas 2015: Compendio Estadístico 2015.
- Jha, Vyoma 2014: The coordination of climate finance in India: Centre for Policy Research and Overseas Development Institute.
- Joerin, J.; R. Shaw; Y. Takeuchi and R. Krishnamurthy 2014: The adoption of a Climate Disaster Resilience Index in Chennai, India. In: *Disasters* 38:3, pp 540–561.
- Jørgensen, Kirsten; Anu Jogesh and Arabinda Mishra 2015: Multi-level climate governance and the role of the subnational level,. In: *Journal of Integrative Environmental Sciences* 12:4, pp 235–245.
- Junghans, Lisa and Lukas Dorsch 2015: Finding the Finance – Financing Climate Compatible Development in Cities: Germanwatch.
- Kamiya, Marco 2016: New solutions to close the gap on municipal finance. Retrieved 11 Nov 2016, from <http://citiscopes.org/habitatIII/commentary/2016/03/new-solutions-close-gap-municipal-finance>.
- Kessides, Ioannis M. 2012: Electricity Reforms. What Some Countries Did Right and Others Can Do Better (View Point. Public Policy for the Private Sector, Note Number 332: The World Bank Group).
- KfW 2016: KfW ermöglicht umweltfreundliches Bauen in Chile. Retrieved 21 Jan 2017, from [https://www.kfw.de/nachhaltigkeit/Aktuelles/News-Details\\_372865.html#](https://www.kfw.de/nachhaltigkeit/Aktuelles/News-Details_372865.html#).
- Kharas, Homi and Johannes F. Linn 2013: External Assistance for Urban Finance Development: Needs, Strategies, and Implementation. In: Bahl, Roy W.; Linn, Johannes F.; Wetzels, Deborah L. (ed.): *Financing Metropolitan Governments in Developing Countries*. Cambridge, MA: Lincoln Institute of Land Policy.
- Kitchen, Harry and Enid Slack 2015: More Tax Sources for Canada's Largest Cities: Why, What, and How? IFMG Papers on Municipal Finance and Governance: IFMG; Munk School of Global Affairs (University of Toronto).
- Knieling, Jörg; Nancy Kretschmann; Lisa Kunert and Thomas Zimmermann 2012: Klimawandel und Siedlungsstruktur: Anpassungspotenzial von Leitbildern und Konzepten: HafenCity Universität Hamburg.
- Knutti, Reto: Projections of climate change: Climate sensitivity, cumulative carbon, 2013,
- Krellenberg, Kerstin and Katrin Barth 2012: Plan de Adaptación para la Región Metropolitana de Santiago de Chile: Helmholtz Centre for Environmental Research – UFZ.
- Krellenberg, Kerstin and Juliane Welz 2016: Vulnerabilidad frente al cambio climático en la Región Metropolitana de Santiago de Chile: posiciones teóricas versus evidencias empíricas. In: *EURE (Santiago)* 42:125, pp 251–272.
- La Tercera 2016a: Diez comunas del país concentran el 39% de la deuda municipal. Retrieved 19 Jan 2017, from <http://www.latercera.com/noticia/diez-comunas-del-pais-concentran-el-39-de-la-deuda-municipal/>.
- La Tercera 2016b: Senado aprueba norma que permite eleccion democratica de Intendentes. Retrieved 19 Jan 2017, from <http://www.latercera.com/noticia/gobierno-baja-presion-elegir-intendentes-2017-asegurar-apoyos/>.
- Low Carbon City Lab 2016: Green Bonds for Cities. Three Tools to Unlock the Potential.
- Mahabir, Jugal and Ntombizodwa Mabena 2015: Identifying The Funding Constraints In Municipal Capital Investments. Submission for the 2015/16 Division of Revenue.
- McKinsey Global Institute 2010: India's urban awakening. Building inclusive cities, sustaining economic growth: McKinsey & Company.
- Microjuris 2017: Ley 19.990 Dispone La Elección Popular Del Órgano Ejecutivo Del Gobierno Regional.
- Ministerio de Energía 2017: Comunas con Estrategias Energéticas Locales. Retrieved 20 Feb 2017, from <http://www.minenergia.cl/comunaenergetica/?cat=20>.

- Ministerio del Interior Chile 2005: Ley Organica Constitucional sobre Gobierno y Administración Regional. Ley no. 19.175, 08-NOV-2005 (last update: 15-OCT-2016).
- Ministerio del Interior Chile 2006: Ley Organica Constitucional de Municipalidades. Ley no. 18.695, 26-JUL-2006 (last update: 06-DIC-2016).
- Ministerio del Medio Ambiente 2008: Plan Nacional de Accion de Cambio Climatico 2008-2012.
- Ministerio del Medio Ambiente 2015: Presidenta Bachelet anuncia creación de Agencia Chilena de Cambio Climático. Retrieved 22 Jan 2017, from <http://portal.mma.gob.cl/presidenta-bachelet-anuncia-creacion-de-agencia-chilena-de-cambio-climatico/>.
- Ministerio del Medio Ambiente 2016: Plan de acción nacional de cambio climático 2017-2022.
- Ministry of Finance 2012: Economic Survey 2011-12: Ministry of Finance, Government of India.
- Ministry of Urban Development 2016: The Smart City Challenge Stage 2. Smart City Proposal Chennai: Ministry of Urban Development, Government of India.
- Municipality of Santiago 2016: Santiago gana el Sustainable Transport Award 2017. Retrieved 20 Jan 2017, from <http://www.municipalidaddesantiago.cl/santiago-gana-el-sustainable-transport-award-2017/>.
- Muñoz, Juan Carlos; Juan de Dios Ortúzar and Antonio Gschwender 2009: Transantiago: The Fall and Rise of a Radical Public Transport Intervention. In: Saleh, Wafaa; Sammer, Gerd (ed.): *Travel Demand Management and Road User Pricing. Success, Failure and Feasibility*. London: Routledge.
- Nakhooda, Smita; Charlene Watson and Liane Schalatek 2015: *The Global Climate Finance Architecture*: Overseas Development Institute.
- National Treasury South Africa 2014: *The state of local government finances and financial management as at 30 June 2014*.
- National Treasury South Africa 2016a: *Budget Review 2016*.
- National Treasury South Africa 2016b: *Municipal Money*. Retrieved 08 Nov 2016, from <https://municipalmoney.gov.za>.
- New Climate Economy 2014: *Better Growth, Better Climate: The New Climate Economy Report*.
- New Climate Economy 2016: *The Sustainable Infrastructure Imperative*.
- Nixon, H.; V. Chambers; S. Hadley and T. Hart 2015: *Urban Finance: Rapid Evidence Assessment*. London: Overseas Development Institute.
- OECD 2011: *Handbook on the OECD-DAC Climate Markers*.
- OECD 2015: *Cities and climate change. National governments enabling local action (Policy Perspectives)*: OECD and Bloomberg Philanthropies.
- OECD and Bloomberg Philanthropies 2014: *Cities and Climate Change: National governments enabling local action (Policy Perspectives)*.
- Parramon-Gurney, Marie and Andrew Gilder 2012: *South Africa's Municipal Integrated Development Plans (Inside stories on climate compatible development: Climate & Development Knowledge Network)*.
- Paulais, Thierry 2012: *Financing Africa's Cities: The Imperative of Local Investment*. Washington, DC: World Bank.
- Proyecto ClimaAdaptaciónSantiago; Gobierno Regional Metropolitano de Santiago; Ministerio del Medio Ambiente Nacional and Secretaría Regional Ministerial de Medio Ambiente 2012: *Plan de Adaptación al cambio climático para la Region Metropolitana de Santiago de Chile*.
- Reserve Bank of India 2007: *Trends In Municipal Finances In India*.
- Roberts, D. 2008: *Thinking globally, acting locally -- institutionalizing climate change at the local government level in Durban, South Africa*. In: *Environment and Urbanization* 20:2, pp 521–537.
- Roberts, D. 2010: *Prioritizing climate change adaptation and local level resilience in Durban, South Africa*. In: *Environment and Urbanization* 22:2, pp 397–413.
- Roberts, D. and S. O'Donoghue 2013: *Urban environmental challenges and climate change action in Durban, South Africa*. In: *Environment and Urbanization* 25:2, pp 299–319.



- Roumeau, Samuel; Aisha Seifelislam; Shazade Jameson and Loraine Kennedy 2015: Water Governance and Climate Change Issues in Chennai (USR 3330 "Savoirs et Mondes Indiens" Working papers, 8).
- Salcedo, Rodrigo 2010: The Last Slum: Moving From Illegal Settlements to Subsidized Home Ownership in Chile. In: *Urban Affairs Review* 45:3, pp 90–118.
- SANBI 2014: Project Proposal to The Adaptation Fund: Building Resilience in the Greater uMngeni Catchment.
- Santam 2015: Climate Change Positioning Statement. Retrieved 19 Jan 2017, from <https://www.santam.co.za/media/2934/climate-change-policy.pdf>.
- Secretaría de Medio Ambiente 2017: Portal Cambio Climático. Retrieved 03 Mar 2017, from <http://www.data.sedema.cdmx.gob.mx/cambioclimaticocdmx/index.html>.
- Shreejith, S. H. and T. V. Ramachandra 2014: Comparative analysis of greenhouse gas emissions from major cities in India. In: *International Journal of Renewable Energy and Environmental Engineering* 2:1, pp 38–43.
- Slack, Enid 2011: Financing Large Cities and Metropolitan Areas (IMFG Papers on Municipal Finance and Governance, 3: Institute on Municipal Finance and Governance, Munk School of Global Affairs, University of Toronto.
- Smallridge, Diana; Barbara Buchner; Chiara Trabacchi; Maria Netto; Jose Juan Gomes Lorenzo and Lucila Serra 2013: The Role of National Development Banks in Catalyzing International Climate Finance: Inter American Development Bank.
- Smolka, Martim 2013: Implementing Value Capture in Latin America – Policies and Tools for Urban Development: Lincoln Institute of Land Policy.
- Solecki, C. W.; P. Romero-Lankao; S. Mehrotra; S. Dhakal; T. Bowman and S. Ali Ibrahim 2015: Climate Change and Cities. Second Assessment Report of the Urban Climate Change Research Network. New York: Columbia University.
- South Africa 1996: Constitution of the Republic of South Africa. NO. 108 OF 1996.
- South Africa 2015: South Africa's Intended Nationally Determined Contribution (INDC).
- South African Cities Network 2016: Finance and innovation: Sustainable financing for today's and tomorrow's cities. Chapter 7 of the State of Cities Report 2016.
- Sridhar, Kala Seetharam und Guanghua Wan (eds.) 2014: Urbanization in Asia. New Delhi: Springer.
- Stanton, Anne 2009: Decentralisation and Municipalities in South Africa: An Analysis of The Mandate to Deliver Basic Services: University of KwaZulu-Natal.
- Statistics South Africa 2016: Municipalities raise infrastructure spending despite tough economic conditions. Retrieved 08 Nov 2016, from <http://www.statssa.gov.za/?p=8099>.
- Stumhofer, Tim; Annette Detken and Jochen Harnisch 2015: Proposal of a methodology for tracking publicly mobilized private climate finance (Materials on Development Financing: KfW Development Bank.
- SUBDERE 2006: Manual de Operaciones, Procedimientos Internos: Procesos y diagrama FNDR: Subsecretaria de Desarrollo Regional Y Administrative (SUBDERE).
- SUBDERE 2009: Fondo Comun Municipal.
- Suzuki, Hiroaki; Jin Murakami; Yu-Hung Hong and Beth Tamayose 2015: Financing Transit-Oriented Development with Land Values – Adapting Land Value Capture in Developing Countries: World Bank.
- Technical Assistance Unit & Western Cape Government 2013: Increasing Investment in Climate Change Related Projects at the Sub National Level. South Africa:
- The Hindu 2015: In the Chennai Corporation, there is a Control Room, with a Special Projects Cell, that can act as the Climate Cell as well. However, this Cell will need to be strengthened to look into Climate Change as part of their regular work and not only during emergencies, as is the practice now. (Kandasamy). Retrieved 20 Mar 2017, from <http://www.thehindu.com/news/cities/chennai/facing-funds-crunch-civic-projects-in-chennai-hit-a-roadblock/article7517812.ece>.



- The World Bank Group 2016a: Institutional Blending via Second-Tier Lender FINDETER in Colombia: The World Bank Group.
- The World Bank Group 2016b: The CURB Tool. Retrieved 09 Mar 2017, from <http://www.worldbank.org/en/topic/urbandevelopment/brief/the-curb-tool-climate-action-for-urban-sustainability>.
- Times of India 2017: Municipal bonds: How Corporation is missing out on opportunity. Retrieved 14 Mar 2017, from <http://timesofindia.indiatimes.com/city/chennai/municipal-bonds-how-corporation-is-missing-out-on-opportunity/articleshow/57612300.cms>.
- TNPCB 2016: Ambient Air Quality monitoring Programme at Chennai. Retrieved 09 Mar 2017, from <http://www.tnpcb.gov.in/Airquality.html>.
- Transport for London 2017: Congestion charge. Retrieved 05 Jan 2017, from <https://tfl.gov.uk/modes/driving/congestion-charge>.
- Trujillo, Jesus Leal; Joseph Parilla and Slaven Razmilic 2016: Global Santiago. Profiling the Metropolitan Region's International Competitiveness and Connections: The Brookings Institution, Metropolitan Policy Program.
- UN HABITAT 1992: Multilingual glossary of human settlements terms.
- UN HABITAT 2015: Guiding Principles for City Climate Action Planning.
- UN HABITAT 2016: New Urban Agenda. Resolution adopted by the General Assembly on 23 December 2016.
- UNDESA 2014: World Urbanization Prospects. The 2014 Revision, Highlights: UNDESA United Nations, Department of Economic and Social Affairs, Population Division.
- UNDP 2016: Consultant to develop a Working Paper on Additionality of Adaptation and Mitigation Projects: Definition, Demonstration & Application. Retrieved 04 Feb 2017, from [https://jobs.undp.org/cj\\_view\\_job.cfm?cur\\_job\\_id=66430](https://jobs.undp.org/cj_view_job.cfm?cur_job_id=66430).
- UNDP-OneWorld 2014: Enhancing Readiness for Climate Finance: Experiences from Eastern and Southern Africa.
- UNEP 2014: Climate Finance for Cities and Buildings – A Handbook for Local Governments. Paris: UNEP Division of Technology, Industry and Economics (DTIE).
- UNFCCC Standing Committee of Finance 2016: 2016 Biennial Assessment and Overview of Climate Finance Flows.
- UN-HABITAT 2009: Guide to Municipal Finance (The Human Settlements Financing Tools and Best Practices Series,
- van Staden, Rian 2014: Climate Change: Implications for Cities. Key Findings from the Intergovernmental Panel on Climate Change Fifth Assessment Report.
- World Bank 2010: Cities and climate change: an urgent agenda (Urban Development Series Knowledge Papers, Vol. 10: World Bank.
- World Bank 2013: Financing Sustainable Cities: How We're Helping Africa's Cities Raise Their Credit Ratings. Retrieved 24 Oct 2016, from <http://www.worldbank.org/en/news/feature/2013/10/24/financing-sustainable-cities-africa-creditworthy>.
- World Bank 2014: Global Infrastructure Facility. Retrieved 10 Nov 2017, from <http://www.worldbank.org/en/topic/publicprivatepartnerships/brief/global-infrastructure-facility-backup>.
- World Bank 2016: City Creditworthiness Initiative: A Partnership to Deliver Municipal Finance. Retrieved 24 Oct 2016, from <http://www.worldbank.org/en/topic/urbandevelopment/brief/city-creditworthiness-initiative>.
- Yan, Katy and Zachary Hurwitz 2013: Policy Brief to the Green Climate Fund on Additionality: International Rivers.
- Z/Yen Group and WWF 2015: Financing the Transition: Sustainable Infrastructure in Cities. A Long Finance Report.



# 10. Annex I: Multi- and bilateral funds

## 10.1 International climate funds

### Adaptation Fund (AF)

#### Relevance for urban climate finance

The AF provides funding for two types of activities:

#### 1) Adaptation and resilience-building

The AF provides funding for adaptation-related activities in the following fields: Agriculture, Coastal Zone Management, Disaster Risk Reduction, Food Security, Forests, Multisector Projects, Rural Development, Urban Development and Water Management. The AF currently has 6 projects listed under the urban development theme.

#### 2) Climate finance readiness (readiness support)

The Readiness Programme for Climate Finance aims to strengthen the capacity of national and regional entities to receive and manage climate financing for adaptation/resilience.

#### Access modalities

The AF works with two types of partners:

**Implementing Entities:** Parties seeking funding from the AF must submit the project and programme proposals through accredited National Implementing Entities (NIEs), Regional Implementing Entities (RIEs) or Multilateral Implementing Entities (MIEs).

**Designated Authorities (DAs)** are government officials who act as points of contact for the AF. On behalf of their national governments, the designated authorities support a) the accreditation applications of NIEs or RIEs before they are sent to the fund's secretariat for assessment, b) proposals by NIEs, RIEs, or MIEs for adaptation projects and programmes in the respective country.

Proposals will be reviewed with respect to specific criteria available in the Operational Policies and Guidelines. Proposals are accepted three times a year.

#### Rel. for Chile, India, SA

The AF provides funding for developing countries that are parties to the Kyoto Protocol and are particularly vulnerable to the adverse effects of climate change. The three case study countries have access through:

- Chile – DA: Ministry of Environment; NIE: Agencia de Cooperación Internacional de Chile (AGCI); RIE: Corporación Andina de Fomento (CAF)
- India – DA: Ministry of Environment, Forests and Climate Change; NIE: National Bank for Agriculture and Rural Development (NABARD)
- South Africa – DA: Department of Environmental Affairs; NIE: South African National Biodiversity Institute (SANBI)

Moreover, they have access through 12 multilateral implementing entities, including UN organizations (United Nations Development Programme (UNDP), etc.) and multilateral development banks (AfDB, etc.).

For a full list of multilateral implementing entities please see <https://www.adaptation-fund.org/apply-funding/implementing-entities/multilateral-implementing-entities/>

#### Sources

Website: <https://www.adaptation-fund.org>



## Clean Technology Funds (CTF)

### Relevance for urban climate finance

The CTF (established in 2008) finances projects aimed at promoting low-carbon technologies embedded in nationally appropriate mitigation actions in developing countries.

CTF financing is highly relevant for urban areas, since clean technologies are particularly relevant for the energy, industry, transport and building sectors. For instance, CTF funding of around US\$ 600 million has been approved and are under implementation for transport projects (primarily to finance mass urban transport investments).

However, since CTF projects need to be part of a national investment plan, local governments need to work alongside national governments to ensure that urban projects are included in national investment plans in order to be eligible for CTF funding.

Besides standard CTF financing, in 2013 another modality called Dedicated Private Sector Programmes (DPSPs) was created. This modality fosters the financing of private sector projects that are aligned with country priorities and CTF programme objectives.

### Access modalities

Countries have access to the CTF via their national governments and the relevant MDBs (Inter-American Development Bank, Asia Development Bank and African Development Bank, respectively).

All CTF projects need to be part of an **investment plan**, which has to be approved by both the relevant Multilateral Development Bank and the CTF's Trust Fund Committee. Once an investment plan is in place, the approval of specific projects and activities will be performed by the relevant MDB.

### Rel. for Chile, India, SA

The CTF is currently accessible for 21 developing countries. Chile, India and South Africa are three of the 21 eligible countries for CTF. They have approved investment plans and are already implementing CTF projects.

CTF Investment Plan for India: <http://www.moef.nic.in/sites/default/files/IP-CTF-2011.pdf>

CTF Investment Plan for Chile: [https://www-cif.climateinvestmentfunds.org/sites/default/files/CTF\\_IP\\_Revision\\_Chile\\_Sept2013.pdf](https://www-cif.climateinvestmentfunds.org/sites/default/files/CTF_IP_Revision_Chile_Sept2013.pdf)

CTF Investment Plan for South Africa: [https://www-cif.climateinvestmentfunds.org/sites/default/files/meeting-documents/ctf\\_south\\_africa\\_investment\\_plan\\_revised\\_final\\_111009\\_0.pdf](https://www-cif.climateinvestmentfunds.org/sites/default/files/meeting-documents/ctf_south_africa_investment_plan_revised_final_111009_0.pdf)

### Sources

Website: <https://www-cif.climateinvestmentfunds.org/fund/clean-technology-fund>

## Global Environment Facility (GEF)

### Relevance for urban climate finance

The GEF provides funding for national projects and programmes that fall under one of its focal area strategies (Biodiversity, Climate Change Mitigation, International Waters, Land Degradation, Chemicals and Waste, Sustainable Forest Management). Urban management projects can receive funding from several of these focal areas.

Moreover, the GEF for the first time implements Integrated Approaches during the GEF-6 replenishment period (2015-2018). One of the three integrated approach pilots focuses on **Sustainable Cities**. It will operate within an initial funding envelope of \$ 55 million. Amongst other things, funding will be used to support a select number of pilot demonstrations of high-impact, integrated sustainable cities initiatives. Yet, the GEF will not directly invest in infrastructure projects as this may be done through multi- or bilateral donor financial institutions.

The **GEF Small Grants Programme** (SGP) provides technical assistance and grants of up to \$50,000 directly to local communities for projects in one of the GEF's focal areas. Although SGP funding is modest, it enables communities to develop capacities for larger projects (replicating, upscaling). All SGP projects are managed by UNDP and UNOPS, but communities have direct ownership.

### Access modalities

The **Operational Focal Point** (OFP) coordinates all GEF activities within a country. Amongst other things, he/she decides on the executing agency of a project and selects the GEF Partner Agency to accompany project



implementation. The OFP is usually a high-level officer of a national governmental agency. Many countries have two OFPs. For local governments to propose a project, it usually has to collaborate with the OFP. The SGP can be accessed direct by local governments.

**Executing agencies** can be civil society organisations, private sector companies, research institutions or other organisations.

The GEF currently has 18 **Partner Agencies**. The GEF has launched in 2011 a pilot scheme on accrediting new institutions (including at least 5 national institutions) to serve as partners for the implementation of GEF projects. In October 2014, DBSA from South Africa was approved by the GEF Council as ‘GEF Project Agency’. This is the first local financial institution in a developing/middle-income country to ever get an accreditation from one of the international public finance mechanisms.

#### Rel. for Chile, India, SA

The three case study countries coordinate their GEF activities through:

- Chile – OFPs: Mr Cristian Gutierrez (Ministry of Environment), Mr Miguel Stutzin (Ministry of Environment)
- India – OFPs: Mr Raj Kumar (Ministry of Finance), Mr R. R. Rashmi (Ministry of Environment, Forests and Climate Change)
- South Africa – OFPs: Mrs Nosipho Ngcaba (Department of Environmental Affairs), Mr Zaheer Fakir (Department of Environmental Affairs); Partner Agency: DBSA

#### Sources

Website: [www.thegef.org](http://www.thegef.org)

GEF-6 Programming Directions: <https://www.thegef.org/sites/default/files/documents/GEF-6%20Programming%20Directions.pdf>

## Green Climate Fund (GCF)

### Relevance for urban climate finance

The GCF provides funding for:

#### 1) Low-emission and climate-resilient development

The GCF provides funding for 8 impact areas related to mitigation, adaptation and sustainable development. The majority of these are highly relevant for urban climate-compatible development.

- Mitigation: Low-emission energy access and power generation, Low-emission transport, Energy efficient buildings, cities and industries, Sustainable land use and forest management
- Adaptation: Enhanced livelihoods of the most vulnerable people, communities and regions; Increased health and well-being, and food and water security; Resilient infrastructure and built environment; Resilient ecosystems

#### 2) Climate finance readiness (readiness support)

Readiness support is an ongoing process to strengthen a country’s engagement with the GCF. This programme is relevant for municipal entities that are either seeking accreditation with the GCF or (if already accredited) that want to develop projects/programmes.

#### Access modalities

Generally, the GCF works with two types of partners:

**National Designated Authorities (NDA) or Focal Points** act as the core interface between a developing country and the Fund. All communication with the Fund and funding proposals are channelled through the NDAs.

**Accredited Entities (AE) or Executing Entities** may submit funding proposals in consultation with the NDAs. They can be public or private as well as international, regional, national or sub-national entities. In November 2016, the GCF had registered 41 AEs across the globe, of which 27% were national entities, 17% regional and 56% international. Another 154 entities were seeking accreditation.

#### Rel. for Chile, India, SA

All developing countries can apply for GCF funding. The three case study countries have direct access through:

- Chile – NDA: Ministry of Finance; Accredited Entity: Corporación Andina de Fomento (CAF)
- India – NDA: Ministry of Environment, Forests and Climate Change; Accredited Entities: National Bank for Agriculture and Rural Development (NABARD), Acumen Fund Inc.
- South Africa – NDA: Department of Environmental Affairs; Accredited Entities: South African National Biodiversity Institute, Development Bank of Southern Africa (DBSA)

Moreover, they have international access through a variety of international accredited entities, including UN organisations (Food and Agriculture Organisation of the United Nations (FAO), etc.), development banks (African Development Bank (AfDB), etc.), bilateral development cooperation agencies (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, etc.), foundations (Conservation International, etc.), commercial banks (Deutsche Bank, etc.) and others.

For a full list of international access entities please see the AE Directory <http://www.greenclimate.fund/partners/accredited-entities/ae-directory>

#### Sources

Website: [www.greenclimate.fund](http://www.greenclimate.fund)

GCF Readiness and Preparatory Support Programme Guidebook: [http://www.greenclimate.fund/documents/20182/466886/Readiness\\_and\\_Preparatory\\_Support\\_Guidebook.pdf/9eea580f-a109-4d90-b281-c54695114772](http://www.greenclimate.fund/documents/20182/466886/Readiness_and_Preparatory_Support_Guidebook.pdf/9eea580f-a109-4d90-b281-c54695114772)

## Least Developed Countries Fund (LDCF)

### Relevance for urban climate finance

The LDCF provides funding for the preparation and implementation of National Adaptation Programmes of Action (NAPAs) in least developed countries (according to the UN classification). NAPAs should identify priority activities to address urgent and immediate climate-related risks. Therefore, climate change-related projects in urban areas of least developed countries can be financed through the LDCF if they are part of a NAPA.

The LDCF is managed by the Global Environment Facility (GEF).

### Access modalities

Governments (national and local), NGOs and Community-Based Organisations (CBOs) can be “Project Proponents”. Project Proponents need to enter into a partnership with one of the ten Implementing Agencies of the GEF (ADB, IDB, AfDB, EBRD, FAO, IFAD, UNDP, UNEP, UNIDO and World Bank). Project concepts need to be endorsed by the GEF Operational Focal Point.

### Rel. for Chile, India, SA

The LDCF is reserved for least developed countries. Chile, India and South Africa are not classified as such. Hence, they cannot enter the LDCF.

### Sources

Website: [http://unfccc.int/cooperation\\_and\\_support/financial\\_mechanism/least\\_developed\\_country\\_fund/items/4723.php](http://unfccc.int/cooperation_and_support/financial_mechanism/least_developed_country_fund/items/4723.php)

NAPAs: [http://unfccc.int/national\\_reports/napa/items/2719.php](http://unfccc.int/national_reports/napa/items/2719.php)

LDCF Access Guide: [http://adaptasiapacific.org/sites/default/files/documents/LDCF\\_access\\_guide.pdf](http://adaptasiapacific.org/sites/default/files/documents/LDCF_access_guide.pdf)

LDC list: [http://www.un.org/en/development/desa/policy/cdp/ldc/ldc\\_list.pdf](http://www.un.org/en/development/desa/policy/cdp/ldc/ldc_list.pdf)

## Pilot Programme for Climate Resilience (PPCR)

### Relevance for urban climate finance

The \$1.2 billion PPCR is a funding window of the Climate Investment Funds (CIF) for climate change adaptation and resilience building. It empowers countries and regions to approach climate resilience and supports national governments in financing projects that build on national development programmes and plans. Cities can be beneficiaries, but the PPCR pilot programmes are intended to be country-led.



### Access modalities

Countries can access the PPCR through the development banks working in their country by providing an expression of interest in response to a call from the CIF. The PPCR Sub-Committee conducts an expert review, identifying specific regional or country pilot programmes and agreeing to an overall amount. Specific projects are then prepared within that programmed amount. These proposals are subsequently submitted to the PPCR Sub-Committee for specific approval.

#### Rel. for Chile, India, SA

Only participating countries under PPCR receive funding. PPCR is currently active in 19 countries and two regions worldwide. To date, South Africa, Chile, and India are not participating.

#### Sources

Website <http://www-cif.climateinvestmentfunds.org/fund/pilot-program-climate-resilience>

PPCR Fact Sheet (2016): [http://www-cif.climateinvestmentfunds.org/sites/default/files/knowledge-documents/ppcr\\_fact\\_sheet\\_november\\_2016.pdf](http://www-cif.climateinvestmentfunds.org/sites/default/files/knowledge-documents/ppcr_fact_sheet_november_2016.pdf)

## Special Climate Change Fund (SCCF)

### Relevance for urban climate finance

The SCCF supports the following topics in developing countries:

- Climate change adaptation: Encompassing water resources management, natural resource management, agriculture, health, infrastructure development, fragile ecosystems, integrated coastal zone development, climactic disaster risk management.
- Technology transfer
- Energy, transport, industry, agriculture, forestry and waste management
- Economic diversification (for fossil fuel dependent countries)

Currently, only the adaptation and technology transfer windows are active.

Since its creation in 2001 under the UNFCCC, the SCCF has supported many adaptation activities in or around urban areas, especially regarding water resources management, coastal zone management, infrastructure development and natural resource management. Hence, the SCCF is highly relevant for funding urban adaptation in developing countries.

The SCCF is managed by the Global Environment Facility (GEF).

### Access modalities

As in the case of the LDCF, governments (national or local), NGOs and community-based organisations (CBOs) can propose SCCF projects. The first step to access SCCF funds is to develop a project concept and request assistance from one of the ten Implementing Agencies of the GEF. Thereafter, the Project Proponent must secure the endorsement of the national GEF Operational Focal Point.

#### Rel. for Chile, India, SA

Chile, India and South Africa are eligible for SCCF since they are classified as developing countries by United Nations and are signatory parties to the UNCCCCF (i.e. they are Non-Annex I Parties to the UNCCCCF).

#### Sources

Website: <https://www.thegef.org/topics/special-climate-change-fund-sccf>

Accessing resources under the SCCF: [http://www.thegef.org/sites/default/files/publications/23470\\_SCCF\\_1.pdf](http://www.thegef.org/sites/default/files/publications/23470_SCCF_1.pdf)

List of qualifying developing countries (Non-Annex I Parties to the UNCCCCF): [http://unfccc.int/parties\\_and\\_observers/parties/non\\_annex\\_i/items/2833.php](http://unfccc.int/parties_and_observers/parties/non_annex_i/items/2833.php)

## 10.2 Multi- and bilateral development banks

### World Bank Group<sup>30</sup>

#### Relevance for urban climate finance

According to Junghans and Dorsch (2015), the two main financial instruments of the World Bank are loans (IBRD) and credits (IDA) with sovereign guarantees being required by both institutions.

- **Specific Investment Loans** (SILs) fund the construction of infrastructure and provide consultant service.
- **Subnational Development Policy Lending** (DPL) supports policy and institutional reforms as well as capacity building.

In addition, there are special programmes for urban areas and sub-national entities:

- The **Sustainable Cities Initiative** (World Bank) is a forum for knowledge sharing, focusing on planning and financing cities. It supports local governments in Europe and Central Asia.
- The **Eco2 Initiative** is part of the Urban Strategy of the World Bank and aims to provide cities with practical, scalable, analytical, and operational support to enhance their ecological and economical sustainability. The platform also aims to build a partnership among cities, academia, and development communities.
- The **City Creditworthiness Initiative** (World Bank) supports local authorities in improving their financial performance, develop policy frameworks for sub-national borrowing, and enhance their creditworthiness.
- The **Subnational Finance Programme** (World Bank, IFC) offers creditworthy local governments and selective state owned entities the opportunity to finance public infrastructure projects without taking

sovereign guarantees. The programme also offers help for the mobilisation of domestic resources as well as for capacity building and increasing creditworthiness.

#### Access modalities

Local governments can apply for SILs through their national government agencies. Subnational entities eligible for DPL include state and local governments with legislative and budgetary authority.

#### Rel. for Chile, India, SA

SILs and DPLs are provided to World Bank member countries or to a subnational division of a member country. India, Chile, and South Africa are all eligible to receive loans and credits.

#### Sources

DPL: <http://www1.worldbank.org/publicsector/pe/befa05/OP860.htm>

Sustainable Cities Initiative: <https://www.worldbank.org/en/region/eca/brief/sustainable-cities-initiative>

Eco2 Initiative: [http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1270074782769/Eco2\\_Cities\\_Book.pdf](http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1270074782769/Eco2_Cities_Book.pdf)

City Creditworthiness Initiative: <http://www.worldbank.org/en/topic/urbandevelopment/brief/city-creditworthiness-initiative>

Subnational Finance Programme: <http://www.globalclearinghouse.org/infradev/assets%5C10/documents/Subnational%20Brochure%20CSF.pdf>

### Public-Private Infrastructure Advisory Facility (World Bank)

#### Relevance for urban climate finance

PPIAF is a global technical assistance facility managed by the World Bank on behalf of multilateral and bilateral donors, facilitating private sector involvement in infrastructure (electricity, gas transmission and distribution, water and sewage, solid waste, telecommunications, and roads) through framing strategies, designing

<sup>30</sup> The World Bank Group comprises the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) (together referred to as the "World Bank") as well as the International Finance Corporation (IFC), the International Centre for Settlement of Investment Disputes (ICSID) and the Multilateral Investment Guarantee Agency (MIGA).





and implementing policy reforms, and capacity building and implementing pioneering projects. Capacity building for climate resilient infrastructure is one of the priority areas.

PPIAF supports sub-national entities through the **Sub-National Technical Assistance (SNTA)** programme to develop capacity to access market based financing without sovereign guarantees to improve infrastructure services. Technical assistance includes facilitating credit ratings, implementing financial assessments and coaching, supporting transaction preparation, and helping the central government monitor and evaluate the financial health of local authorities.

#### Access modalities

PPIAF supports national governments, regional institutions, and sub-national entities including municipalities. Technical Assistance is provided through Programme Grants and Coverage Grants. Grants for knowledge products are provided through Strategic Knowledge Initiatives and Commissioned Products.

#### Rel. for Chile, India, SA

Countries eligible to receive PPIAF assistance are those in the list of aid recipients of the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (Chile is listed). But PPIAF also supports selected priority middle-income countries (activities in India and South Africa have already been funded).

#### Sources

Website: <https://ppiaf.org/>

SNTA: [https://ppiaf.org/documents/4421?ref\\_site=ppiaf](https://ppiaf.org/documents/4421?ref_site=ppiaf)

Types of Grants: <https://ppiaf.org/apply-funds>

## African Development Bank (AfDB)

### Relevance for urban climate finance

The **Clean Energy Investment Framework (CEIF)** and the **Climate Risk Management and Adaptation Strategy (CRMA)** articulate AfDB's response to climate change. They provide guidance for the Bank's **Climate Change Action Plan (2011–2015)**, which seeks to strengthen urban governance and deliver resilient urban systems.

Through its **Urban Development Strategy**, the AfDB supports urban development by combining economic growth and social development while taking climate change into account. The focus is on infrastructure delivery (transport, power, water, sanitation, lighting), urban governance (urban planning, fiscal decentralisation, transparency), and private sector development.

The **Africa Climate Change Fund (ACCF)** was designed to cover a wide range of climate-resilience and low-carbon activities (also in the urban sector). The ACCF assists national governments to prepare for accessing climate funding, to integrate climate change into strategic documents, to prepare adaptation and mitigation projects, capacity building etc.

#### Access modalities

The Urban Development Strategy seeks to provide finance primarily through loans and guarantees to central governments as well as private sector loans. Sub-sovereign financing for credit-worthy municipalities constitutes a potential area of interest for the Bank, but is currently not considered as finance option.

Direct beneficiaries of the ACCF are also central governments as well as NGO's, research institutions, and regional institutions.

#### Rel. for Chile, India, SA

The AfDB primarily supports regional member states (South Africa), but also provides funding for selected non-regional members (India).

#### Sources

Website: <https://www.afdb.org/en/>

AfDB Urban Development Strategy (2011): <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/Urban-Development%20Strategy-Rev%201.pdf>

ACCF (2014): [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/Establishment\\_of\\_the\\_Africa\\_Climate\\_Change\\_Fund.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/Establishment_of_the_Africa_Climate_Change_Fund.pdf)

## Asian Development Bank

### Relevance for urban climate finance

The **Urban Operational Plan** for the years 2012 to 2020, is setting out the future direction and approach for the urban sector operations of the ADB. The plan has a “focus on improving planning and financing capacities”.

The **Urban Financing Partnership Facility (UFPF)** was established for providing technical assistance, guarantees, and investment cofinancing for climate change mitigation and adaptation of urban infrastructure projects. It is comprised of the Urban Climate Change Resilience Trust Fund and the Urban Environmental Infrastructure Fund. The UFPF supports public transport, water supply and sanitation, solid waste management and urban renewal projects.

In the course of the Sustainable Development Goals, the ADB announced the doubling of its climate financing for Asia-Pacific to US\$ 6 billion by 2020, including city related issues (e.g. smart cities, sustainable transport) (ADB 2015).

### Access modalities

Traditionally the ADB works with member countries with their funding flowing through national budgets. However, the ADB is aware that stronger partnerships with local private and public stakeholders need to be established (ADB 2013). Through the UFPF, ADB seeks to provide more innovative finance through e.g. resources for targeted subsidies, credit enhancement mechanisms, and PPP programmes.

### Rel. for Chile, India, SA

The ADB operates in India.

### Sources

Website: <https://www.adb.org/>

Urban Operational Plan: <https://www.adb.org/sites/default/files/institutional-document/33812/files/urban-operational-plan-2012-2020.pdf>

UFPF: <https://www.adb.org/sites/default/files/institutional-document/33812/files/urban-operational-plan-2012-2020.pdf>

Double Climate Finance (2015): <https://www.adb.org/news/adb-double-annual-climate-financing-6-billion-asia-pacific-2020>

## Corporacion Andina de Fomento (CAF)

### Relevance for urban climate finance

CAF established the **Latin American Climate Change Programme (PLACC)** as well as the **Climate Change Mitigation Programme**. Within this scope, a specific strategy to deal with climate change from an urban perspective is supposed to be developed by CAF in the near future.

So far, CAF initiated the **Cities with a Future** programme to promote social inclusion, productivity and eco-efficiency in cities. The main objective is to offer technical and financial support which includes measures that enhance urban planning and development policies, provide plans for infrastructure development, analyse vulnerabilities and make adaptations for climate change. Support is primarily offered for the projects prioritized in governments' development plans.

CAF developed an analytical tool called **Observatory of Urban Mobility**, which examines a range of issues related to mobility and transportation in selected Latin American cities, including energy and emissions. The findings will be useful for cities aiming to improve sustainable urban and transport planning, using data to craft better local, metropolitan and national regulations, as well as allocate financial resources accordingly.

Supported by the CAF, the **Footprint of Cities Project** supports municipal governments in guiding the growth of their cities towards climate resilient development (through e.g. calculation of carbon and water footprint)

### Access modalities

Loans represent CAF's main financial tool and are primarily provided for central governments of member countries and the private sector. Sovereign loans are also provided to local governments.

### Rel. for Chile, India, SA

Chile is a member state of CAF and eligible for funding.



## Sources

Website: <https://www.caf.com/en/>

Notes on Financial Statement 2015: [https://www.caf.com/media/3783077/caf\\_31-12-2015\\_\\_ingl\\_s\\_coninformedelosauditoresindependientes.pdf](https://www.caf.com/media/3783077/caf_31-12-2015__ingl_s_coninformedelosauditoresindependientes.pdf)

Strategic Climate Change Mitigation Programme: [http://publicaciones.caf.com/media/42457/climate\\_change\\_strategy\\_caf.pdf](http://publicaciones.caf.com/media/42457/climate_change_strategy_caf.pdf)

## Inter-American Development Bank (IDB)

### Relevance for urban climate finance

The IDB's **Climate Change Strategy** foresees lending and technical assistance in climate-sensitive sectors, in order to mainstream mitigation and adaptation in its operations. The priority sectors include “sustainable urban transport” and “integrated urban development and climate-resilient cities”.

The IDB's **Emerging and Sustainable Cities Programme (ESC)** is offering non-reimbursable technical assistance providing direct support to subnational governments in the development and execution of city Action Plans. The ESC approach is based on the pillars of (1) environmental and climate change sustainability, (2) urban sustainability, and (3) fiscal sustainability and governance.

The **IDB IntraFund** is a fast-disbursing fund for assisting local governments in the identification, development, and preparation of climate resilient and sustainable infrastructure projects. Resources can be used for preparation of pre-feasibility and feasibility studies, project design, document preparation and revision to carry out financing requests and/or for bidding purposes, and studies related to project viability using new technologies or sources of energy.

### Access modalities

The main financing instruments of the IDB for the public sector are sovereign guaranteed loans (investment loans, policy-based loans, and development sustainability credit-line). Non-sovereign guaranteed loans, which are primarily for the private sector, can also be accessed by subnational institutional investors.

InfraFund resources will be provided under two modalities: (1) non-reimbursable technical cooperation operation, and (2) contingent recovery TC operations

### Rel. for Chile, India, SA

IDB operates in Latin America and the Caribbean only. Projects in Chile are eligible for funding.

### Sources

CC-Strategy: <http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=35802849>

ESC: <http://www.iadb.org/en/topics/emerging-and-sustainable-cities/implementing-the-emerging-and-sustainable-cities-program-approach,7641.html>

IntraFund: <http://www.iadb.org/en/topics/transportation/what-is-intrafund,1639.html>

Public Sector Loans: <http://www.iadb.org/en/about-us/idb-financing/public-sector-loans,6048.html>

## European Investment Bank (EIB)

### Relevance for urban climate finance

One of the EIB's priority areas is environment and climate. They offer lending (loans, venture capital, micro-finance, equity and fund investment), blending (bonds, guarantees etc.), and advisory services. Under the **Urban Agenda for the EU**, the EIB's specifically finances projects on city-level through direct investment loans, framework loans directly to cities, framework loans via financial intermediary, and equity fund investments, but only within the European Union.

### Access modalities

Larger projects can be financed either directly to a project promoter or indirectly through a government or financial intermediary (e.g. State Bank of India, Banco Santander Chile). For smaller projects the EIB can provide credit lines to selected financial institutions, which then on-lend the funds mainly to SME's.

### Rel. for Chile, India, SA

More than 90% of EIB's activity is in Europe, but they also invest in projects worldwide. Current EIB external mandates include South Africa, Chile, and India. In these countries, EIB gives priority to climate change

mitigation and adaptation, development of social and economic infrastructure, and private sector development.

#### Sources

Website: <http://www.eib.org/projects/sectors/urban-development/index.htm>

Regions eligible for funding: <http://www.eib.org/projects/regions/index.htm>

Access modalities: <http://www.eib.org/projects/regions/ala/index.htm>

---

## European Bank for Reconstruction and Development (EBRD)

---

### Relevance for urban climate finance

One of the relevant sectors and topics for EBRD is Municipal and Environmental Infrastructure (MEI). They support the delivery of urban services such as water, public transport, urban roads and lighting, solid waste management, district heating, and energy efficiency. One of the goals is to help municipalities adapt to climate change. The range of financing instruments for MEI, includes sub-sovereign loans, corporate debt, quasi-equity debt, guarantees, and targeted credit lines etc.

### Access modalities

EBRD primarily invests in private companies, either directly or through financial intermediaries, such as local banks and investment funds. Municipalities can receive loans through local banks, which are supported by EBRD.

### Rel. for Chile, India, SA

The EBRD does not work in South Africa, Chile, or India.

### Sources

Website: <http://www.ebrd.com/municipal-and-environmental-infrastructure.html>

MEI-Strategy: <http://www.ebrd.com/what-we-do/sectors-and-topics/municipal-and-environmental-infrastructure/mei-overview.html>

---

**Bilateral development banks include the German KfW, French AFD, Japanese JBIC and others.**

**Please see their website for details on their funding themes.**

## 10.3 Other multi- and bilateral public finance

- Urban Climate Change Resilience Trust Fund
- Local Climate Adaptive Living Facility (UN Capital Development Fund)
- Global Climate Change Alliance+ (European Commission)
- International Climate Initiative (Germany)
- International Climate Fund (UK)
- Global Climate Change Initiative (US)
- NAMA facility (UK and Germany)
- Global Climate Partnership Fund (Germany, UK, Denmark)



# 11. Annex II: Requirements for GCF accreditation

Entities seeking accreditation with the GCF have to be able to safeguard funded projects and programmes against any unforeseen environmental or social harm; manage GCF's resources in line with the Fund's fiduciary standards; manage environmental and social risks that may arise at the project level; and comply with the Fund's Gender Policy.

audits and ensures an independent review of financial statements and internal controls (external audit). An internal control framework is in place to ensure that the entity operates effectively, reliably and in compliance with applicable laws and regulations. Procurement is transparent and fair.

Table 6: Standards and principles of the GCF

Fiduciary standards	Environmental and Social Safeguards
<ul style="list-style-type: none"> <li>• Basic: Key administrative and financial capacities; transparency and accounting</li> <li>• Specialized fiduciary standards: project management, grant award mechanisms, on-lending and/or blending</li> </ul>	<ul style="list-style-type: none"> <li>• 8 Performance Standards, adopted from the International Finance Corporation (IFC)</li> </ul>
	Gender Policy
	<ul style="list-style-type: none"> <li>• Background, rationale, objectives and principles of the GCF gender policy</li> </ul>

Entities accredited by the GEF, Adaptation Fund, and DG DEVCO can apply for accreditation through the "fast-track accreditation process" that focuses on GCF's accreditation requirements (gaps) that have not been assessed in other accreditation processes.

## Fiduciary standards

The GCF requires accredited implementing entities to comply with basic fiduciary standards related to key administrative and financial capacities as well as transparency and accountability. Moreover, it defines a set of specialized fiduciary standards concerning project management, grant award mechanisms and on-lending and/or blending (Green Climate Fund 2014).

- **Key administrative and financial capacities:** The entity has the capacity and structures to set and achieve adequate goals. It is capable of transparent and consistent financial planning, disbursement, monitoring and reporting. It carries out internal

- **Transparency and accountability:** The entity promotes full transparency and accountability. Tools, functions and an organisational culture prevent fraud, money laundering, terrorist financing or other financial malpractice. All conflicts of interest are financially disclosed. An investigation function is established that provides for the investigation of allegations of fraudulent and corrupt practices.
- **Initial specialized fiduciary standards:** The entity has the required institutional capacities to undertake specialized activities in line with its mandate within the Fund's operations. This can refer to project management (project preparation and appraisal, oversight and control, monitoring and evaluation, risk management); grant award mechanisms (eligibility criteria and evaluation, awarding procedures, transparent allocation and implementation of grants); and/or on-lending and/or blending (creditworthiness; track record for on-lending and blending; due diligence policies; etc.).



## Environmental and social safeguards

The GCF temporarily uses the Performance Standards (PS) of the International Finance Corporation (IFC) until it develops its own Environmental and social safeguards (ESS) (Green Climate Fund 2014). Entities seeking accreditation with the GCF need to comply with these ESS and ensure that funding proposals also comply with the same safeguards. The eight ESS are as follows:

- PS 1: Assessment and Management of Environmental and Social Risks and Impacts
- PS 2: Labour and Working Conditions
- PS 3: Resource Efficiency and Pollution Prevention
- PS 4: Community Health, Safety, and Security
- PS 5: Land Acquisition and Involuntary Resettlement
- PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- PS 7: Indigenous Peoples
- PS 8: Cultural Heritage

## Gender Policy

The GCF Governing Instrument recognises the importance of gender considerations in terms of impact and access to climate funding and lists women explicitly amongst the Fund's stakeholders. Through its gender policy the GCF aims to achieve more effective and equitable results and impacts; make sure that both men and women become more resilient; mitigate risks for women and men associated with activities financed by the Fund; and contribute to reducing the gender gap that make women more vulnerable to climate change (Green Climate Fund 2015b).

The main operational responsibility for the implementation of the gender policy lies with the accredited entities. More specifically, they are required to conduct mandatory initial socioeconomic and gender assessments; gender equitable stakeholders' consultations; inclusion of gender perspective in the application of the mandatory ESS; and project screening for gender sensitivity.



## 12. Annex III: Initiatives supporting climate-smart urban development and finance

Initiative: description	Services
<p><b>C40 Cities Climate Leadership Group:</b> Platform for more than 80 cities. Convenes peer-to-peer networks in support of cities' climate change efforts.  <a href="http://www.c40.org/">http://www.c40.org/</a></p>	<p>Networks for city members (e.g. Sustainable Infrastructure Finance Network); research; events (e.g. city awards)</p>
<p><b>C40 Cities Finance Facility:</b> Programme under C40, implemented by C40 and GIZ.  <a href="http://www.c40.org/programmes/cities_">http://www.c40.org/programmes/cities_</a></p>	<p>Technical assistance and capacity development support for up to four C40 cities to plan and implement climate projects. First two pilot cities: Bogota, Mexico City.</p>
<p><b>Financing Sustainable Cities Initiative:</b> Programme under C40, implemented by C40, WRI Ross Centre for Sustainable Cities and Citi Foundation  <a href="http://www.c40.org/programmes/financing_sustainable_cities">http://www.c40.org/programmes/financing_sustainable_cities</a></p>	<p>Peer-to-peer learning community, technical assistance, and online platform to accelerate investment in sustainable urban solutions.</p>
<p><b>Cities Climate Finance Leadership Alliance (CCFLA):</b> Alliance of over forty public and private organisations working to mobilize investment into low-carbon, climate-resilient cities.  <a href="http://www.citiesclimatefinance.org/">http://www.citiesclimatefinance.org/</a></p>	<p>Advocacy; Scaling-up successful financial products; Growing pipelines of bankable projects; Creating enabling environments; Catalysing and brokering partnerships; coordinating and managing research &amp; knowledge</p>
<p><b>Transformative Actions Programme (TAP):</b> Programme of ICLEI. Application open to all local and subnational governments that want to improve capital flows and investments.  <a href="http://tap-potential.org/">http://tap-potential.org/</a></p>	<p>Technical assistance and capacity building for local/subnational governments to improve their access to climate finance, increase their visibility and design local financing mechanisms.</p>
<p><b>100 Climate Solutions Projects Campaign:</b> Campaign by R20 and the Leonardo DiCaprio Foundation (LDF) for sub-national governments.  <a href="http://regions20.org/our-projects/100-climate-solutions-projects-campaign/#">http://regions20.org/our-projects/100-climate-solutions-projects-campaign/#</a></p>	<p>Funding for projects related to renewable energy, energy efficiency and waste management infrastructure. Cities and regions from any country are eligible.</p>
<p><b>Low Carbon Cities Programme:</b> The programme is a service offered by the Carbon Trust for city and state governments.  <a href="https://www.carbontrust.com/low-carbon-cities/">https://www.carbontrust.com/low-carbon-cities/</a></p>	<p>Technical assistance and consulting services for cities, states and regions to develop area-wide carbon reduction strategies.</p>
<p><b>Low Carbon City Lab (LoCaL):</b> Programme by Climate-KIC in cooperation with the GFZ, the South Pole Carbon Group, the National Physical Laboratory, and the Laboratoire des Sciences du Climat et de l'Environnement.  <a href="http://local.climate-kic.org/">http://local.climate-kic.org/</a></p>	<p>Capacity building and technical assistance for city governments to monitor emissions, design mitigation projects and access funding.</p>
<p><b>Green Bonds for Cities (GBC):</b> The project is led by the South Pole Group and Climate Policy Initiative, and part of Climate-KIC's LoCaL. It seeks to contribute to the development of a green city bond market in emerging and developing countries.  <a href="http://local.climate-kic.org/projects/green-bonds-for-cities-gbc/">http://local.climate-kic.org/projects/green-bonds-for-cities-gbc/</a></p>	<p>Training and technical assistance for cities in developing countries seeking to issue green bonds according to international guidelines.</p>

Initiative: description	Services
<b>Local Climate Adaptive Living Facility (LoCAL):</b> Facility of the UN Capital Development Fund that serves as a mechanism to integrate climate change adaptation into local governments' budgeting systems. <a href="http://www.local-uncdf.org/">http://www.local-uncdf.org/</a>	Performance-based grants for climate resilience for least-developed countries in Africa and Asia. The funds are awarded to national governments and then channelled to regional and local governments through the national intergovernmental transfer systems.
<b>Urban Climate Change Resilience Partnership (UCCRP) + Trust Fund (UCCRTF):</b> Developed by the UK Department for International Development, the Rockefeller Foundation and USAID. The Asian Development Bank is administering the fund.	Grants for city governments for the implementation of infrastructure and policy or institutional interventions related to climate finance project and strategies, plus technical assistance, capacity building and networking. Only Bangladesh, Pakistan, India, Indonesia, Myanmar, Philippines and Vietnam are currently eligible.
<b>Cities Development Initiative for Asia (CDIA):</b> Partnership initiative established by the Asian Development Bank and the Government of Germany. <a href="http://cdia.asia/">http://cdia.asia/</a>	Technical assistance and capacity building for mid-sized Asian cities to bridge gap between their development plans and the implementation of their infrastructure investments. Only member countries of the Asian Development Bank (ADB) are eligible.
<b>Global Fund for Cities Development (FMDV):</b> International alliance of local and regional governments created by the United Cities and Local Governments (UCLG) and Metropolis' Members. <a href="http://www.fmdv.net/index.php?id=2&amp;L=2">http://www.fmdv.net/index.php?id=2&amp;L=2</a>	Aims at strengthening technical capacities of local governments to address their financial needs for urban development by providing technical assistance and financial engineering.
<b>Asian Cities Climate Change Resilience Network (ACCRN):</b> Network consisting of practitioners, academicians, government officials and professionals launched by the Rockefeller Foundation. <a href="https://www.accrn.net/">https://www.accrn.net/</a>	Regional network connecting professionals and communities across Asia to build inclusive urban climate change resilience; training and technical assistance.
<b>100 Resilient Cities:</b> Network of the Rockefeller Foundation, which selected 100 cities to join. <a href="http://www.100resilientcities.org/">http://www.100resilientcities.org/</a>	Logistical guidance <u>and</u> grant for establishing a Chief Resilience Officer; Technical assistance for development of a robust resilience strategy; Networking with service providers, partners from the private, public and NGO sectors, and other member cities.
<b>Global Infrastructure Basel (GIB):</b> Swiss non-profit foundation working to promote sustainable and resilient infrastructure. <a href="http://www.gib-foundation.org/">http://www.gib-foundation.org/</a>	Help cities to improve their development projects and to find financiers, e.g. by rating projects based on sustainability criteria and inviting cities to pitch their projects at the annual GIB Sustainable Infrastructure Summit.
<b>Cities and Climate Change Initiative (CCCI):</b> Programme under UN-Habitat, which is globally active in 40 cities. <a href="https://unhabitat.org/urban-initiatives/initiatives-programmes/cities-and-climate-change-initiative/">https://unhabitat.org/urban-initiatives/initiatives-programmes/cities-and-climate-change-initiative/</a>	Helps cities to create pro-poor and innovative climate change policies and strategies; develops tools to support city leaders and practitioners in adaptation and mitigation efforts.
<b>Cities Resilience Profiling Programme (CRPR):</b> Programme under UN-Habitat. Partnerships with UNISDR, academic institutes, private sector and NGO's. Works with 10 selected partner cities <a href="https://www.cityresilience.org/">https://www.cityresilience.org/</a>	Provides local governments with risk assessment tools for increasing urban resilience. Tool helps to identify potential risks and prioritize policies and action plans accordingly.
<ul style="list-style-type: none"> <li>• Networks of cities that do not necessarily focus on urban climate-smart development/finance include, for example, the United Cities and Local Governments.</li> <li>• Other initiatives focus on policy advocacy rather than capacity building for cities (e.g. Communitas Coalition for Sustainable Cities and Regions).</li> <li>• Other highly relevant organisations, particularly development cooperation agencies, are not listed here due to space limitations.</li> </ul>	



# 13. Annex IV: Interview guide and lists

## 13.1 Interview guide

### Understanding of urban climate finance

1. From your understanding, what are “mitigation” and “adaptation” in the urban context?
2. What is “urban climate finance” (UCF) from your perspective? Is it important in your context? Why?
3. Which sectors in the municipality do you consider most relevant for urban climate finance? Why?
4. Which examples of successful UCF (projects/programmes/etc.) do you know?

### Status Quo & trends

5. Does Chennai have a pipeline of urban climate-related projects? Can they be funded?
6. What funding schemes does the city currently have that support climate-related measures?
7. Which organisations are particularly relevant for accessing and managing UCF?
8. How are climate change issues integrated into local budgeting processes?
9. Is, or could, UCF be accessed and applied for multi-sectoral projects in your environment?
10. Do climate change departments share budgets on certain projects with other line departments?
11. How does the city track its investments into climate related projects?
12. Which policies, financing instruments or other institutions are currently being developed or implemented that will affect UCF in the future?

### Challenges

13. Which key bottlenecks hamper UCF in Chennai? Please consider, for example:
  - *Awareness, knowledge and skills for accessing and managing UCF*
  - *Institutional structures, (e.g. cooperation) mechanisms and mandate for UCF*
  - *National legal and regulatory framework conditions*
  - *Perceived risks of climate change investments*
  - *Access to international climate finance and private finance, etc.*
14. Which of the aforementioned issues can be easily addressed and how?
15. Which challenges are more difficult to address and why?

### Opportunities

16. Which capacity building needs do you see for the stakeholders involved in UCF?
17. How can climate-related urban planning and financial management be improved?
18. How can climate change be mainstreamed into current urban strategies and investments?
19. Which new financial instruments and additional funding sources could be tapped and how?
20. How can financial intermediation and credit enhancement be used to support UCF in Chennai?
21. How can the national policy environment be improved to facilitate UCF in Chennai?
22. What else needs to be done on the local, national and international levels to increase UCF?

## 13.2 Interview list eThekwini

Name	Organisation/Position
<b>eThekwini Municipality</b>	
Magash Naidoo	Energy Office
Itumeleng Masenya	Energy Office
Krish Kumar	Deputy City Manager and Chief Finance Officer (also leading a C40 group on sustainable infrastructure finance)
Geoff Tooley	Chief Engineers Office
Debra Roberts	Resilient Cities Officer
Sean O'Donnaghue	Environmental Planning and Climate Protection Department: Climate Adaptation Branch
Helene Epstein	Senior Manager, Strategic Spatial Planning
Nongcebo Hlongwa	Environmental Planning and Climate Protection Department: Climate Adaptation Branch
Martin Clement	Botanical Gardens, Durban
<b>City of Cape Town</b>	
Helen Davies	Environmental Resource Management Department
Lance Greyling	Director of Trade and Investment
Daniel Sullivan	Strategic Support Analyst  Strategic Policy Unit, Office of the Executive Mayor
Sarah Ward	Head Energy and Climate Change Environmental Resource Management Department
<b>City of Johannesburg</b>	
Lebo Molefe	Director of Air Quality, Climate Change and Energy Department
Mzukisi	Climate Change Adaptation
Gibbon	Climate Change Mitigation
Thabo	Small Scale Embedded Generation
<b>DBSA</b>	
Tsakani Manyike	Senior Investment Officer, SA Financing Division
Khosi Sogobile	Energy, Infrastructure & IPP office





## National Government

Clement Mulamba	National Treasury IGR, Local Government Finance Policy
Nicky Prins	National Treasury, State Owned Enterprises
Tlou Ramaru	DEA, Director CC Adaptation; Green Fund
Ane Bruwer	COGTA

## Commercial Banks, National Institutions

Attiie van Zyl	INCA CEO
Mary Waller	Manager: Africa Clean Energy Developments, Old Mutual
James Cumming	Africa Clean Energy Developments, Old Mutual
Andre Kruger	Ex ABSA, now Nepad Business Foundation: Africa Investment and Integration
Dr Anton Cartwright	University of Cape Town
Mtholozisi Dlamini	Standard Bank Public Sector Corporate Banking
Elizabeth Dubbeld	GIZ, eThekweni: National Advisor (SA): Cities Fit for Climate Change
Hastings Chikoko	C40: Africa Regional Director
Olivia Rumble	Edward Nathan Sonnenbergs: Lawyer & expert on Municipal Finance Management Act & regulatory environment
Dr Mandy Barnett	SANBI – Adaptation Fund and GCF accredited NIE
Jonathan Ramayia	Cities Support, GIZ, South Africa
Martha Stein-Sochas	AFD Regional Director

## 13.3 Interview list Santiago

Name	Position and Institution
Heloisa Schneider	Advisor on Sustainability and Climate Change – ECLAC
Laetitia Montero	Environmental Affairs Officer – Division for Sustainable Development and Human Settlements – ECLAC
Jillian van der Gaag	KfW Programme on Renewable Energies and Energy Efficiency Coordinator – Corporation for the Promotion of Production (CORFO)
Ángela Reinoso	Technical Management in National Centre for Innovation and Promotion of Sustainable Energies Analyst – CORFO
Andrea Palma	Strategy and Contents Cities Fit for Climate Change – GIZ Chile
Marcela Palominos	Sustainable Economic Growth and Natural Resource Management Coordinator – Ministry of Finance
Fernando Farías	Head of climate change department – Ministry of Environment



Carolina Eing	Planning Department – Gobierno Regional
Ricardo Lobos	Education and Training Area – Ministry of Energy
Julio Cordano	Climate Change Department – Ministry of Foreign Affairs
Pablo Contrucci	Chief Urban Development Division – Ministry of Housing and Urban Development (MINVU)
Carmen Herrera	Regional Director of the Regional Water Directorate
Pedro Vidal	Coordinator of Smart Cities Unit – Ministry of Transports and Telecommunications
Fernando Avila	Municipality of Independencia
José Miguel Arriaza	Regional Ministerial Secretary of Energy – MRS
Jorge Canals	Regional Ministerial Secretary of Environment – MRS
José Paulsen	Urban Regeneration Coordinator – Regional Ministerial Secretariat MINVU
Luz María Molina	Unit of Associativism and Territorial Governance – Undersecretaries for Regional and Administrative Development
María Verónica Bastias	Global Network of Civil Society Organisations for Disaster Reduction (GNDR)
Nicolás Hunneus	Centre for Climate Science and Resilience (CR2) – University of Chile
Genaro Cuadras	Director of City and Territory Lab – Diego Portales University
Lucio Cañete	Academic in Department of Industrial Technologies – Santiago University
Raquel Lejtregger	Environmental Consultant for ECLAC
Cristian Retamales	Environmental Consultant/MAPS Chile
Felipe Flores	Telefónica – Sustainability Coordinator
Ximena Ruz	Assistant Manager – Climate Change and Sustainability Agency (former CPL) – CORFO
Julia Standen	Regional Ministerial Secretariat of Social Development – MRS

## 13.4 Interview list Chennai

Name	Position and Institution
Ms. Chitra	Formerly: Chief Planner, Chennai Metropolitan Development Authority (CMDA)
Mr Sachin Kamble	NABARD
Ms. Namrata Ginoya	WRI
Mr Jayaraman	Tamil Nadu Energy Development Agency
Mr K. S. Venkatagiri	Confederation of Indian Industries, Hyderabad
Vivek Venkataramani	IFMR Lead, Environment and CC Programme
K Saraswati	Madras Chamber of Commerce



Mr V Shiva Kumar	Petroleum Conservation Research Association
Sudhir Chella Rajan	IIT Madras, Indo-German Centre for Sustainability
Mr Murari Rajagopalan	IIT Kharagpur, Geosensing Information Private Limited, Chennai
Mr K S Kandasamy	Deputy Commissioner (Works), Greater Chennai
Dr S R Masilamani	Director, Centre for Human Settlements, School of Architecture and Planning, Anna University
Mr Murugan	General Manager, Tamil Nadu Urban Financial and Infrastructure Development Corporation (TUFIDCO)









Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices  
Bonn and Eschborn

Friedrich-Ebert-Allee 36 + 40  
53113 Bonn, Deutschland/Germany  
T +49 228 44 60-0  
F +49 228 44 60-17 66

Dag-Hammarskjöld-Weg 1-5  
65760 Eschborn, Deutschland/Germany  
T +49 61 96 79-0  
F +49 61 96 79-11 15

E [info@giz.de](mailto:info@giz.de)  
I [www.giz.de](http://www.giz.de)

In cooperation with



On behalf of



Federal Ministry for the  
Environment, Nature Conservation,  
Building and Nuclear Safety