



Multi-Level Climate Governance Supporting Local Action

Instruments enhancing climate change mitigation
and adaptation at the local level

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 "Climate Policy Meets Urban Development" is financed by the International Climate Initiative (IKI).
The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag. Responsible division within the BMU: IK I 4, International Cooperation on Environment, Energy and Cities, OECD and Cooperation with OECD Countries, Dr Vera Rodenhoff

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

Registered offices
Bonn and Eschborn, Germany

Project: "Climate Policy Meets Urban Development"

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
I www.giz.de

Responsible:
Dr Daphne Frank
Head of Project Climate Policy Meets Urban Development

Project Team Climate Policy Meets Urban Development
Coordination of the study: Lisa Lebershausen
Administration: Karen Pacheco

Commissioned Authors:
Paola Adriázola, Eleni Dellas, Dennis Tänzler (adelphi)
Alt-Moabit 91
10559 Berlin

Acknowledgements:
The authors would like to thank Barbara Burkel (adelphi) for her support in preparing this study as well as the anonymous interviewees and collaborators for their helpful inputs, suggestions and comments.

Design and Layout:
EYES-OPEN, Berlin

Photo credits:
Cover: © GettyImages/GlobalVision Communication/GlobalVision 360
Page 14, 20, 59: © Jörg Böthling; Page 26: © GIZ/Dirk Ostermeier;
Page 58, 64, 74, 80: © Amina Schild; Page 69, 85: © AdobeStock

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, August 2018

Foreword

Dear readers,

Finding sustainable solutions goes hand in hand with successful cooperation between all relevant stakeholders. This is especially true in the fight against climate change, one of the greatest threats to sustainable development.

The adoption of the Paris Agreement was a milestone in the history of climate negotiations. Its implementation has become a matter of great urgency. However, we are all aware that the nationally determined contributions (NDCs) are not sufficient to meet the goals set in the Paris Agreement. There is still a large disparity between our international climate goals and current emission development pathways. This gap cannot be bridged by national governments alone. To achieve the climate goals of the Paris Agreement we require dedicated efforts and cooperation across all government levels, and need to also include stakeholders from business and civil society.

The Paris Agreement recognises the importance of the engagement of subnational actors and local governments in addressing climate change. Particularly cities are being more and more recognised for their potential to contribute to greenhouse gas mitigation, and their readiness to drive transformation. Cities are major contributors to climate change. They are, however, also highly vulnerable to the impacts of climate change.

To be able to fulfill their role as important climate actors, local governments require effective and enabling frameworks. These frameworks must support local governments in the development and implementation of mitigation and adaptation activities. This is especially true since the local level is where measures are implemented. Climate action is a shared responsibility that requires vertical and horizontal integration across all levels and sectors of government.

In Germany, we have experienced the importance of vertical cooperation, meaning the cooperation between the national government, our federal states and the cities and municipalities, at first hand. Our National

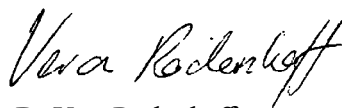
Climate Initiative (NKI) serves to promote local climate action and to intensify the exchange of experiences and cooperation between all levels of government. We also see this in our international cooperation and in projects funded through our International Climate Initiative (IKI).

This study guides through the contemporary discourse, outlines the build-up of governance capacity and presents different applications and relevant stakeholders. Thereby, it strengthens the applicability of multi-level climate governance.

I would like to thank GIZ for commissioning this study and the adelphi team for the dedication and effort they have put into this comprehensive analysis. I extend my gratitude to all the interviewees for their inputs.

I consider this study to be a valuable tool to foster climate change mitigation and adaptation at all levels. By addressing governance capacities along the fields of information and knowledge, finance, coordination and cooperation as well as institutional capacities, stakeholders can tackle the climate action policy field in a structured approach. Furthermore, the various detailed examples from around the globe at the heart of the study provide insights and ideas on how to tackle multi-level climate governance.

This study provides a very good insight into the important topic of multi-level climate governance, its many aspects as well as numerous approaches to scale-up climate action by supporting local actors.



Dr Vera Rodenhoff

Head of Division "International Cooperation on Environment, Energy and Cities, OECD and Cooperation with OECD Countries"
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)

Executive Summary

Two thirds of the world's population—6.3 billion people—are projected to live in urban areas by 2050. Already now, cities significantly contribute to climate change and at the same time face particular consequences that result from it. As the cities that will house this booming urban population are yet to be built in the next few decades, there is an unprecedented opportunity to respond to climate change through urban transformation.

Research shows that cities can make a significant contribution towards keeping climate change below 2 °C. A substantial portion of government mandates—including tasks related to climate mitigation and adaptation, such as waste management, water and sanitation, transport and electricity service delivery—lies in the hands of local governments around the world. However, despite proactive climate initiatives by local governments, current local climate action remains far below its potential. Against this background, recent years have seen active discussion on effective frameworks for multi-level climate governance and coordinated action to help cities in the full realisation of local climate mitigation and adaptation potentials to contribute to the implementation of the Paris Agreement and countries' nationally determined contributions (NDCs).

The concept of multi-level climate governance assumes that a country's different levels of government are mutually dependent when it comes to implementing the Paris Agreement. In fact, the decision on the adoption of the Paris Agreement encourages national governments to work more closely with non-Party stakeholders, which include subnational governments. Concretely, national governments partly rely on regional and local governments to implement national climate strategies geared towards narrowing the emissions gap and to adapting to climate change. Conversely, local and regional governments are affected by the legal, institutional and financial instruments and frameworks put in place by higher levels of government. Countries' existing multi-level frameworks may support—or obstruct—local climate action.

Against this background, the present study explores the following question:

How can different instruments for multi-level climate governance support the realisation of local climate mitigation and adaptation potentials?

Delimiting and understanding multi-level climate governance

Several dimensions deserve attention in multi-level climate governance. The study distinguishes between multi-level climate governance *frameworks*, i.e. the overarching governance system within which different levels of government interact in a country, and multi-level climate governance *instruments*, i.e. the specific platforms, initiatives, funding mechanisms, and action plans that are implemented to support climate action at the local level.

To guide the reader in identifying relevant instruments, the study presents a conceptual framework based on the academic and policy literature:

- **Which governance capacities are strengthened by the instrument?** Different instruments are available to address different needs related to (a) improving access to information and knowledge, (b) ensuring availability of sufficient finance for local climate action, (c) promoting coordination and cooperation across different levels of government and across government units operating at the same level, (d) and strengthening institutional and human capacities for engaging in local climate action.
- **How do different governments engage in multi-level climate governance?** In some countries, incentives, resources and/or obligations for local governments to engage in local climate action emanate from the national government, while in other countries local governments have substantial autonomy and resources to independently implement local mitigation and adaptation measures in the absence of national-level policies and support

measures. In still other countries, such ‘top-down’ and ‘bottom-up’ approaches are combined in a hybrid multi-level climate governance framework.

- **Who is involved in multi-level climate governance?** Multi-level climate governance can involve different combinations of a multitude of public (local, subnational, national governments and associated bodies) and non-state and private actors (e.g. companies, civil society organisations, philanthropies, and research institutions)¹. Instruments for multi-level climate governance can either exclusively involve governmental actors, exclusively involve non-state actors, or a mix of both. Involvement of non-governmental actors in multi-level climate governance can be useful to ensure awareness and consideration of different perspectives and increasing buy-in and support for implementation. It can moreover be useful to mobilise additional

resources and knowledge where local governments have limited powers to autonomously implement climate action.

Multi-level climate governance instruments: Findings and recommendations

In order to answer the question of how different multi-level climate governance instruments can support the realisation of local climate mitigation and adaptation potentials, the study conducted a scoping of various illustrative instruments used in different parts of the world. The figure below clusters these instruments in categories.

Figure: Overview of instrument categories

Governance capacities	Instruments			Goal: Supporting the development of the local climate action policy field
Information and knowledge	Monitoring and reporting	Certification and award schemes		
Finance	Municipal own-source revenues	Domestic climate and development finance		
Coordination and cooperation	National policy alignment	Inter-municipal and regional cooperation	Networks, city twinning and partnerships	
Institutional capacities	Human resources and capacities			

¹ Paragraph 118 of Decision 1/CP.21 accompanying the Paris Agreement refers to non-state actors as non-Party stakeholders. This grouping encompasses non-state and private actors, as well as cities and regions. Cities and regions in this study are often referred to as subnational entities, reflecting the terminology found on practitioner and academic literature before and after COP 21.

Monitoring and reporting instruments are essential to track progress on climate action, evaluate key challenges and incentives for implementation at different governance levels, and provide an evidence base for future policy decisions. They include accounting methodologies that help local governments measure and monitor their greenhouse gas emissions, and reporting platforms through which local governments can register their climate action commitments and/or GHG emissions. The study includes a case study of the **Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)**, a GHG accounting and reporting framework that supports local governments in compiling emissions inventories that are consistent with IPCC guidelines and can therefore potentially feed into progress tracking at the national and global levels.

A variety of other monitoring and reporting instruments are also available to suit the needs of different actors. However, the diversity of existing monitoring and reporting instruments impedes their relevance for multi-level climate governance. The lack of shared indicators, methodologies, etc. hampers the comparability of reported data. Moreover, many existing monitoring and reporting platforms also suffer from inconsistent or incomplete data collection. These shortcomings hamper the extent to which the aggregated impact of local climate action can be clearly demonstrated at the national and international level.

- ➔ We recommend that national governments and international partners support the development of national programmes for city-scale GHG emissions inventories as well as local vulnerability assessments to ensure that the collected data is comparable and can be aggregated. This may also include (financial) support for adequately trained local personnel that are able to collect and analyse relevant data. National governments should moreover ensure that relevant available data—e.g. national statistics—is spatially disaggregated to allow for comparisons of progress at the subnational level.

Certification and award schemes are a group of instruments that recognise and standardise climate action efforts by local governments. Certification schemes assess the extent to which local governments

adhere to certain standards, benchmarks and processes. Award schemes honour outstanding achievements. Both certification and award schemes are designed to incentivise local governments to engage in local climate action through the benefits of a certificate or label, such as increased recognition. They may also influence the decisions of other actors, such as investors (who may prefer to invest in cities which have demonstrated a commitment to climate action as indicated by certification). The study includes a case study of the European **Energy Award** and **Comuna Energética** (Chile), two energy management and certification schemes that support municipalities and regions in systematically planning and implementing energy efficiency and renewable energy measures, and continuously monitoring and improving those measures once implemented.

- ➔ National governments should consider supporting the development of such certification schemes if they are looking to incentivise, acknowledge and identify good practices at the local level. Certification schemes can be particularly useful to incentivise the establishment of long-term, institutionalised processes to support local climate action, as local governments usually need to demonstrate continued commitment to climate action to maintain certification.

Municipal own-source revenues are sources of finance that are raised by local governments, and over whose use they can decide on their own volition, thus increasing their budgetary control. However, the own-source revenues of most local governments are too limited to finance large scale climate-friendly investments. Especially smaller local governments are often unable to collect sufficient own-source revenues and are thus dependent on intergovernmental transfers or other sources of external funding such as grants, subsidies and international climate and development finance, which can be tied to certain conditions. Moreover, the extent to which the own-source revenue available to local governments is used for climate projects (or climate-friendly urban development) will depend on the priorities, mandate and other sources of finance available to a local government. The study includes a case study of the **Climate Action Plan Tax** (USA), the world's first carbon tax to be implemented at the city level in 2007 in Boulder,

Colorado. Other examples of own-source revenue instruments for local governments include charges and fees (for example, Amsterdam has increased parking fees, which has contributed to a reduction in car trips and an increase in cycling), bonds (such as Mexico City's green bonds), energy partnerships (which are implemented in the German federal state of Berlin since 1996) and internal contracting (which has been successfully applied in cities such as Stuttgart, Udine and Agueda).

→ We recommend that national governments first assess the resource base of local governments for distinct functions related to climate policy, also focusing on which funding sources are already used, which are the most needed and which will be affected in the future. Moreover, independent actors (for example development partners and research entities) should support and coordinate with national governments in carrying out assessments of the extent to which existing domestic policy and regulatory frameworks (such as inter-governmental transfer and municipal regulations) allow or impede municipal resource-raising power. In addition, processes of “climate-sensitive local budgeting” may be supported, depending on the degree of fiscal, administrative and public sector decentralisation enabled by higher levels of government in the respective country. Further, the overall principle of adequate fiscal decentralisation (not only strictly linked with tasks related to climate change mitigation and adaptation) should be upheld. This clearly also has important repercussion to the climate change policy field. Local governments should carry out assessments of financial needs and opportunities to leverage own resources.

If the ability of local governments to collect own-source revenues is limited, they may require other **domestic climate and development finance** to fully utilise their local climate action potentials. There are different sources of public domestic finance for local governments such as loans, transfers, and grants from higher levels of government. Whether intergovernmental transfers and grants are earmarked or unconditional (for general purpose) tends to also determine the degree to which they can be used to fund different mandates of local government and finance climate

projects, and the flexibility that local governments have in determining what kind of climate projects to use funding for. However, intergovernmental transfers are often insufficient, unstable and often not designed with climate change considerations (i.e. long-term planning) at the forefront. This may limit their potential to influence and stimulate effective local climate action. An example of a successful domestic climate finance scheme that is discussed in detail in the study is Sweden's **Klimatklivet**, which finances local climate measures such as charging infrastructure for electric vehicles, biogas plants, bike infrastructure, and extensions of district heating networks.

→ Information on whether and to what extent local governments are accessing funds provided by domestic sources has not been compiled globally and is elusive. We therefore recommend that national governments conduct a financial needs assessment for local climate action as a pillar of NDC implementation. Based on this assessment, an investment plan (cross-cutting, sector specific) and/or specific funding arrangements can be established to support local climate activities.

National policy alignment promotes coherence in the activities of different subnational jurisdictions, and coordination across different levels of government and line ministries. Examples of national policy alignment instruments include (but are not limited to) national climate policies, plans and strategies that clearly address the local level; and national urban policies with a focus on climate change. Both approaches are suitable for translating the targets countries have committed to in their NDCs into concrete, multi-level implementation strategies and explicating the roles and responsibilities of national, subnational and local governments. Consultation processes are a crucial component of national policy alignment, as such instruments promote exchanges among relevant actors, can incentivise mainstreaming of climate change in different sectors and ensure that insights from different actors on the successes and shortcomings of national policies are heard. The study includes detailed accounts of three national policy alignment instruments: Uganda's **National Climate Change Policy**, which clearly specifies roles for local governments in the design and implementation of climate actions; Chile's **Regional Climate Change Committees**,

which bring together regional and local actors to support the integration of climate change in policies at the regional and local level in a manner that is coherent with national policies; and Kenya's **National Climate Change Council** and **National Climate Change Directorate**, which support policy coordination, guidance and oversight across all levels of government.

- ➔ We recommend that national, regional and local governments collaborate to initiate processes of policy coordination to help them define how to move from short-term objective to long-term targets and identifying the roles that the different levels should play in a country. Such processes should also aid in the identification of the concrete measures to be taken at different levels to ensure an enabling environment that is conducive to climate action.

The main purpose of **inter-municipal and regional cooperation** is to address issues that transcend jurisdictional boundaries by coordinating competencies at new scales. Climate challenges are not constrained by administrative boundaries and can often be more effectively addressed when expertise and power are bundled and a coherent regional strategy is developed (e.g. in the case of transport networks, water resource management, disaster risk management). Cooperating with other municipalities or the regional level enables local governments to access information and knowledge as well as greater technical and financial capabilities. For example, collaborative arrangements such as Subnational Pooled Financing Mechanisms (SPFMs) can provide joint access to private capital markets or public sector funding for local governments with limited individual financial expertise and credit ratings. The study includes a case study of Mexico's *Comisión Ambiental de la Megalópolis*, which is an example of a metropolitan governance structure that coordinates regional administration, planning and implementation of environmental actions.

- ➔ We recommend that, where appropriated and warranted, national governments create rules and regulations in the domestic administrative and policy framework that are conducive to enable effective inter-municipal and regional cooperation. In addition, national governments can assess,

when necessary, whether inter-municipal and regional instruments reshaping competences across jurisdictions are doing so in a manner aligned with democratic legitimacy.

Networks, city twinning and partnerships aggregate the voices of local governments and represent them vis-à-vis the national and international spheres. They also enable local governments in finding peers for sharing information, learning and knowledge. By associating with networks and partnerships, local governments can increase international recognition and prestige, and may gain access to international debates. Despite many potential advantages, studies also indicate that caution is required regarding the potential of city networks to contribute to the achievement of global climate change goals. For example, there is a regional bias, with most cities that participate in city networks being concentrated in the Global North. Thus, the benefits of city networks in catalysing climate action may be reaching mostly cities in wealthier and more developed countries. The study includes a case study of **We Are Still In** (USA), an initiative by US non-federal actors, including local and state governments that emerged to communicate participants' ongoing commitment to the Paris Agreement.

- ➔ Local governments looking to establish partnerships and combine their voices should assess whether joining such networks and partnerships is beneficial. Considering the current regional biases in the membership of city networks, these networks should endeavour to communicate their tangible benefits—such as proven learning and diffusion of good practice—to a wider membership (i.e. expanding from a focus on the North to the Global South and reaching out to secondary cities in addition to large metropolises). National governments and international partners should recognise the value of city networks as a partner that can aggregate the concerns of local governments and communicate them to higher levels of government, and assist local governments in understanding and localising the Paris Agreement and NDCs. This implies, for example, supporting strong national city networks that have a broad and inclusive membership—not just the largest cities in a country.

Local governments require **human resources** with adequate technical, institutional and strategic **capacities** to develop and implement locally appropriate adaptation and mitigation strategies and concepts. Skilled personnel is necessary to effectively lead policy processes, steer their implementation and monitoring and serve as focal points for horizontal coordination with other local governments as well as vertical coordination with key national agencies. Examples of instruments that can help improve the human resources and capacities of local governments include the provision of funding for the recruitment of expert personnel, trainings to improve the skills and knowledge of local government employees, and mentoring programmes involving experts or other local governments. The study includes a case study of Germany's **climate manager** programme, which provides financial support for municipalities to hire a climate manager to coordinate municipal climate activities and support the implementation of local climate action plans.

- National and local governments must ensure that adequate personnel working on climate change is attracted to the public sector and included in their budgets. Through the university system and national public administration academies, national governments should ensure high-quality education of skilled engineers, architects and public sector staff to prepare them to deal with climate change uncertainty, cross-cutting planning and specific technical issues related to climate change mitigation and adaptation. International partners should continue supporting on-the-job capacity development for government officials in all departments of the local, regional and national level on climate issues. The final objective should be the capacity development and sustainability at the institutional (not the personal) level.

Country case studies: Findings

The study also includes four **country case studies**—**Brazil, Colombia, India** and **South Africa**—that illustrate how different multi-level climate governance frameworks work in practice and the ways in which

different instruments have been implemented. The analysis indicates that all countries benefit from some 'hybridity' in their multi-level climate governance frameworks. This does not mean that all countries should strive to adopt hybrid multi-level climate governance frameworks. Rather, countries with top-down or bottom-up frameworks may benefit from minor shifts. For example, countries with top-down frameworks can improve policies requiring local governments to implement climate action plans by listening to them to understand how national policies are actually supporting—or hindering—local implementation. Countries with strong bottom-up frameworks may benefit from a minimum of alignment with the national level to avoid incoherent and detached approaches. And countries with hybrid multi-level climate governance frameworks can also benefit from studying the successes of countries with top-down and bottom-up approaches.

The case studies also illustrate that instruments should not be seen as compartmentalised solutions that can be inserted into existing institutional and political contexts, but as part of an enabling policy mix for local climate action. In other words, instruments are not silver bullets; they rather need to make sense for the country's reality. The needs of local government in different countries depend largely on the domestic context and on the interplay between different instruments (the policy mix). For instance, national climate change policies that specify a role for local governments will usually be more successful if they are accompanied by meaningful consultation platforms that involve representatives from different levels of government. Similarly, instruments to strengthen institutional capacities, for example by training expert personnel, can hardly work without a reasonable and sustainable finance stream, whether it is municipal own-source revenue, domestic finance or predictable international finance. As a final example, in a country where local governments have experience in conducting greenhouse gas emission inventories but have limited funding available for climate action, a new monitoring instrument will likely be less relevant than a national subsidy or loan scheme that closes a finance gap.

Content

1	INTRODUCTION	14
1.1	Local governments, climate change and multi-level governance	14
1.2	What is multi-level climate governance?	17
1.3	Approach and structure of the study	17
2	CONCEPTUAL FRAMEWORK: DIMENSIONS OF MULTI-LEVEL CLIMATE GOVERNANCE	20
2.1	What are the governance capacities fostered by multi-level climate governance?	20
2.2	How do governments engage in multi-level climate governance?	22
2.3	Who is involved in multi-level climate governance?	25
3	INSTRUMENTS FOR MULTI-LEVEL CLIMATE GOVERNANCE	26
3.1	Information and Knowledge	28
3.1.1	Monitoring and reporting	28
3.1.2	Certification and award schemes	31
3.2	Finance	34
3.2.1	Municipal own-source revenues	34
3.2.2	Domestic climate and development finance	37
3.3	Coordination and cooperation	40
3.3.1	National policy alignment	40
3.3.2	Inter-municipal and regional cooperation	46
3.3.3	Networks, city twinning and partnerships	50
3.4	Institutional capacities	53
3.4.1	Human resources and capacities	53

4	MULTI-LEVEL CLIMATE GOVERNANCE FRAMEWORKS	58
4.1	Multi-level climate governance in India	59
4.1.1	Background: cities and climate change in India	59
4.1.2	India's multi-level climate governance framework	60
4.1.3	Key instruments in India	60
4.1.4	India's challenges and opportunities	63
4.2	Multi-level climate governance in Brazil	64
4.2.1	Background: cities and climate change in Brazil	64
4.2.2	Brazil's multi-level climate governance framework	65
4.2.3	Key instruments in Brazil	65
4.2.4	Brazil's challenges and opportunities	68
4.3	Multi-level climate governance in Colombia	69
4.3.1	Background: cities and climate change in Colombia	69
4.3.2	Colombia's multi-level climate governance framework	69
4.3.3	Key instruments in Colombia	70
4.3.4	Colombia's challenges and opportunities	73
4.4	Multi-level climate governance in South Africa	74
4.4.1	Background: cities and climate change in South Africa	74
4.4.2	South Africa's multi-level climate governance framework	75
4.4.3	Key instruments in South Africa	75
4.4.4	South Africa's challenges and opportunities	78
5	CONCLUSIONS	80
5.1	Key findings	80
5.2	Recommendations	82
5.2.1	Information and knowledge	82
5.2.2	Finance	83
5.2.3	Coordination and cooperation	85
5.2.4	Institutional capacities	87
	BIBLIOGRAPHY	88

List of Figures

Figure 1.1:	Mitigation contributions of different initiatives by non-state actors	16
Figure 2.1:	Vertical and horizontal interactions	23
Figure 2.2:	Correlation between city power and action across regions	24
Figure 3.1:	Instruments and governance capacities	27
Figure 3.2:	Geographic scope of instrument and country examples	28
Figure 3.3:	Process of the European Energy Award	34
Figure 3.4:	The German Municipal Directive for Climate Protection	57
Figure 4.1:	Municipal expenditures in India and other countries (% GDP)	62
Figure 4.2:	Colombia's institutional arrangements governing climate	71

List of Tables

Table 3.1:	Sub-types and examples of monitoring and reporting instruments	30
Table 3.2:	Sub-types and examples of certification and award schemes	32
Table 3.3:	Sub-types and examples of own-source revenue instruments	35
Table 3.4:	Sub-types and examples of domestic climate and development finance instruments	38
Table 3.5:	Sub-types and examples of national policy alignment instruments	42
Table 3.6:	Sub-types and examples of inter-municipal and regional cooperation	48
Table 3.7:	Sub-types and examples of networks, city twinning and partnerships	52
Table 3.8:	Sub-types and examples of instruments strengthening human resources and capacities	55

List of Acronyms and Abbreviations

AMRUT	Atal Mission for Rejuvenation and Urban Transformation
APPC	Alliance of Peaking Pioneer Cities
BAAQMD	Bay Area Air Quality Management District
BMU	Bundesministerium für Umwelt, Naturschutz, und nukleare Sicherheit
BMZ	Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung
CAM	Corporación Autónoma Regional del Alto Magdalena
CAMe	Comisión Ambiental de la Megalópolis
CAR	Corporaciones Autónomas Regionales
CB27	Fórum das Capitais Brasileiras
CCFU	Climate Change Finance Unit
cCR	carbonn Climate Registry
CICC	Intersectoral Climate Change Commission
CIM	Comitê Interministerial sobre Mudança do Clima
CIMGC	Comissão Interministerial de Mudança Global do Clima
CLCDS	Estrategia de Desarrollo de Bajo Carbono
CO₂	Carbon dioxide
CoGTA	Department of Cooperative Governance and Traditional Affairs
COP	Conference of the Parties
CORECC	Comité Regional de Cambio Climático
CORMAGDALENA	Corporación Autónoma del Río Grande de la Magdalena
CPMUD	Climate Policy Meets Urban Development
CTCN	Climate Technology Centre and Network
CSC	Ciudades Sostenibles y Competitivas
DBSA	Development Bank of Southern Africa
DEA	Department of Environmental Affairs
eca	European Climate Award
ECCC	Executive Committee on Climate Change
eea	European Energy Award

ETICC	Equipo Técnico Interministerial de Cambio Climático
FBMC	Fórum Brasileiro de Mudança do Clima
FINDETER	Financiera de Desarrollo Territorial SA
FNMC	Fundo Nacional sobre Mudança do Clima
GCAA	Global Climate Action Agenda
GDP	Gross domestic product
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GmbH)
GPC	Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
GTF	Global Taskforce of Local and Regional Governments
HRIDAY	National Heritage City Development and Augmentation Yojana
IADB	Inter-American Development Bank
IDP	Integrated Development Plan
IGCCC	Intergovernmental Committee on Climate Change
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent power producer
IPP office	South African Independent Power Producer Office
JNNURM	Jawaharlal Nehru Urban Renewal Mission
JPA	Joint powers authority
KRL	Kommunalrichtlinie
LEDs	Light-emitting diodes
LGMA	Local Governments and Municipal Authorities
LGU	Local government unit
MADS	Ministerio de Ambiente y Desarrollo Sostenible
MFMA	Municipal Finance Management Act
MoLG	Ministry of Local Government
NAPCC	National Action Plan on Climate Change
NAZCA	Non-State Actor Zone for Climate Action
NCCC	National Climate Change Council
NCCP	National Climate Change Policy
NCCRP	National Climate Change Response Policy White Paper
NDC	Nationally Determined Contribution

NGO	Non-governmental organisation
NKI	Nationale Klimaschutzinitiative
OECD	Organisation for Economic Co-operation and Development
PCCB	Paris Committee on Capacity Building
PCE	Policy Committee on Environment
PIGCCT	Planes Integrales de Gestión del Cambio Climático Territoriales
RAMCC	Red Argentina de Municipios frente al Cambio Climático
REIPPP	Renewable Energy Independent Power Producer Programme
SAPCC	State Action Plan for Climate Change
SEK	Swedish Krona
SIP	Strategic Infrastructure Project
SISCLIMA	Sistema Nacional de Cambio Climático
SK:KK	Service- und Kompetenzzentrum: Kommunalen Klimaschutz
SPFM	Subnational Pooled Financing Mechanism
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
US	United States



1 Introduction

1.1 Local governments, climate change and multi-level governance

Two thirds of the world's population—6.3 billion people—are projected to live in urban areas by 2050 (UN DESA 2014). As the cities that will house this growing urban population will be built in the next few decades, the world is facing an unprecedented opportunity to respond to climate change through urban transformation (WBGU 2016). Transformative local climate action is essential as cities both significantly contribute to climate change and suffer from its consequences.

On the one hand, cities account for approximately 70 percent of anthropogenic greenhouse gas (GHG) emissions, even though only 54 percent of the world's population currently resides in cities (UN-Habitat 2016). This disproportionate share of GHG emissions

results from the concentration of people, economic activity, industry and infrastructure in urban areas and the associated higher energy consumption levels (UN-Habitat 2016). Thus, local governments have substantial potential for climate change mitigation. Housing and transport policies, heating and lighting in residential buildings, urban planning and infrastructure development are some of the key leverage points for reduced GHG emissions in urban areas that are often under the mandate of cities, municipalities and other subnational government entities (ibid.). To avoid dangerous climate change, far-reaching transformations will be needed in all of these areas.

On the other hand, the risks that arise as a result of climate change “for people, assets, economies and ecosystems” in urban areas are also projected to increase in the coming decades with more frequent and severe extreme weather events (IPCC 2014: 15; WBGU 2016). Such hazards—including for example storms, flooding, landslides, air pollution, heat waves, droughts, and sea level rise—are amplified for those

living in exposed areas or without access to essential infrastructure, such as slum dwellers (ibid.). While natural variations in climate and seasonal weather patterns have always affected cities, these phenomena are aggravated by human-induced climate change (Solecki et al. 2015; Tänzler et al. 2017). Local government functions, services and infrastructure for “water, energy, sanitation, transport and communication” will moreover be profoundly impacted by climate change risks (WBGU 2016).

Local governments have always played a role in the international climate regime. However, in recent years their capacity to influence climate governance and implement their own local climate actions has increased (WBGU 2016). Against this background, there is increasing recognition of cities’ potential to contribute to the achievement of the goals of the Paris Agreement. This landmark agreement commits the 175 countries that have ratified it or acceded to it to date to implement actions that:

- limit the increase in global average temperature to well below 2 °C, with a view to limit temperature increase to 1.5 °C above pre-industrial levels,
- increase the ability to adapt to the adverse impacts of climate change, foster climate resilience and low greenhouse gas emissions development,
- make finance flows consistent with a pathway towards low GHG emissions and climate-resilient development (Paris Agreement, art. 2).

While references in the Paris Agreement to the role of local governments in addressing climate change and achieving these objectives are limited,² the prominence of cities in the climate negotiations has nonetheless been increasing. For example, governments and international institutions have supported sub-national and non-state climate action as a strategy to encourage agreement on an ambitious treaty at the 21st session of the Conference of the Parties of the United Nations Framework Convention on Climate Change (UNFCCC) (COP 21) and to support the achievement of their own mitigation and adaptation goals (Hale 2016: 13). COP 21 was also the occasion

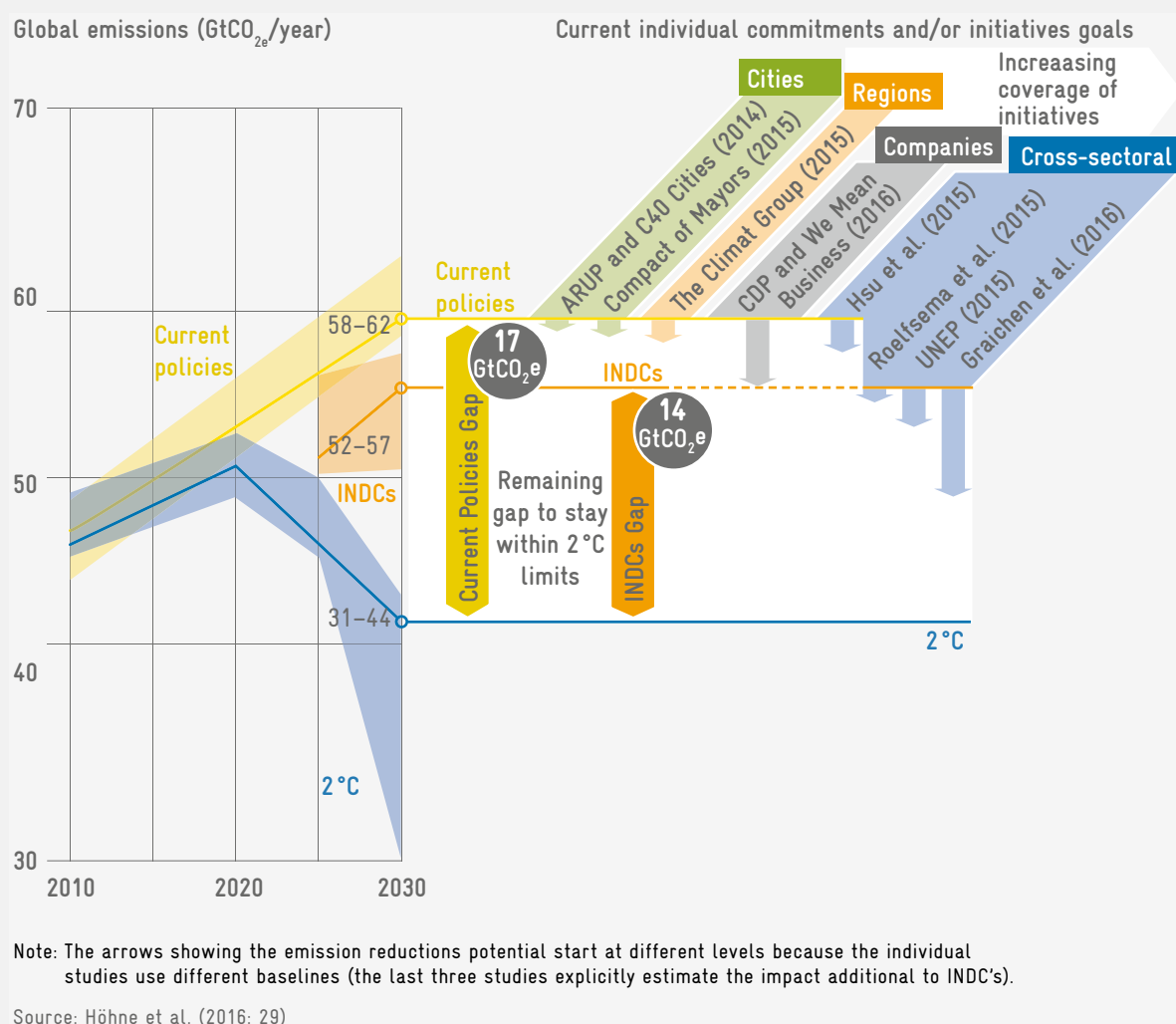
for the launch of the Global Climate Action Agenda (GCAA), which is intended to catalyse implementation and boost cooperative climate action by governments at all levels, businesses, civil society organisations and others. Moreover, at COP 23 local and regional leaders adopted a commitment to climate action — the *Bonn-Fiji Commitment of Local and Regional Leaders to Deliver the Paris Agreement at all Levels*. The signatories commit, inter alia, to strengthening their own climate action and address climate change in a manner that is coherent with other international agendas, such as the 2030 Agenda for Sustainable Development. They also urge the Parties to the Paris Agreement to collaborate with all levels of government in its implementation.

Cities can make a significant contribution towards keeping climate change below 2 °C (C40 Cities and Arup 2014; Höhne et al. 2016; Hsu et al. 2016). While the estimated contributions of local governments and other non-state actors to addressing climate change differ (see Figure 1.1), some have estimated the global potential for urban greenhouse gas emissions reductions to be around 3 gigatonnes carbon dioxide (CO₂) equivalent annually until 2030, which amounts to about one quarter of the gap between the commitments in the current Nationally Determined Contributions (NDCs) of national governments and the target of keeping global warming below 2 °C (Compact of Mayors 2015: 2; Erickson and Tempest 2014: 1).

However, current local climate action remains far below this potential. Recent years have therefore seen active discussion on effective frameworks for multi-level climate governance to help cities fully harness this potential for local climate action, thus contributing to the implementation of the Paris Agreement and the NDCs.

The concept of multi-level climate governance assumes that different levels of government are mutually dependent on each other when it comes to implementing the Paris Agreement. For example, national governments rely on regional and local governments to help implement national climate strategies.

² More prominent references are included in the decision to adopt the Paris Agreement (decision 1/CP.21), which refers to cities and other so-called non-Party stakeholders in several paragraphs, for example welcoming their efforts to address and respond to climate change (para. 133), inviting them to scale up their efforts and support actions to reduce emissions and/or build resilience and decrease vulnerability to the adverse effects of climate change and to demonstrate these via the Non-State Actor Zone for Climate Action (paras. 117, 134), and encourages Parties to work closely with non-Party stakeholders to catalyse efforts to strengthen mitigation and adaptation action (para. 118).

Figure 1.1: Mitigation contributions of different initiatives by non-state actors

Conversely, local and regional governments are affected by the legal, institutional and financial instruments and frameworks put in place by higher levels of government, which may support—or obstruct—local climate action (Corfee-Morlot et al. 2009; Höhne et al. 2016: 30).

Against this background, the present study explores the following question:

How can different instruments for multi-level climate governance support the realisation of local climate mitigation and adaptation potentials?

The aim of this study is not to prove that multi-level climate governance—or urban climate governance—is good and necessary. We assume this to be true.

We also do not seek to make any claims about urban climate governance leading to (or being symptomatic of) a reconfiguration of authority, where national governments are delegating more responsibilities (and corresponding capabilities) to lower levels of government. Multi-level climate governance may be associated both with a decentralisation of authority (e.g. where there are substantial differences in local priorities regarding mitigation and adaptation measures), or a recentralisation of authority (e.g. where there are economies of scale). It may also take place in very different contexts—states where municipal authorities have significant autonomy, as well as states where local autonomy is more limited. This study therefore discusses examples of multi-level climate governance instruments and frameworks representing a range of different political contexts.

1.2 What is multi-level climate governance?

Defining multi-level climate governance requires a clear understanding of what we mean by its three constituent terms: *multi-level*, *climate* and *governance*. While these terms might appear to be self-explanatory, a survey of the literature indicates that this is not the case:

Starting with the term *multi-level*, this is usually understood as referring to both horizontal and vertical interactions between different levels of government (Charbit and Michalun 2009), implicitly assumed to mean local, regional and national governments within the same state, but occasionally also involving supranational institutions such as the EU (e.g. Hooghe and Marks 2006) or international institutions such as the UNFCCC (e.g. Jänicke 2017). Some authors also acknowledge individual human beings as the “micro-level” in multi-level climate governance, since cumulative individual actions can have a significant impact on climate problems (Jänicke 2017). This encompassing definition of “levels” however goes beyond the scope of this study.

We moreover consider multi-level *climate* governance to cover both adaptation and mitigation. Mitigation entails the reduction of GHG emissions by reducing the use of fossil fuels (e.g. by improving the energy efficiency of municipal buildings or reducing emission of fossil fuels from transportation) or by enhancing sinks, while adaptation measures are those that address the impacts caused by climate change, for example by implementing flood protection and drainage systems or improving the climate resilience of infrastructure (Tänzler et al. 2017). While most of the instruments discussed in this study intentionally focus on the multi-level governance of climate change, we also acknowledge that there may be instruments that do not explicitly mention climate change but nonetheless influence the capacity of local governments to implement local adaptation or mitigation measures. Thus, when referring to “climate action”, we consider both adaptation and mitigation efforts.

With respect to *governance*, we understand this as referring to any steering activity that is implemented

in pursuit of policy goals. Crucially, governance thus covers a broad range of both formal and informal instruments. And — while multi-level governance studies sometimes focus primarily on “public actors situated at different levels of government” (Charbit and Michalun 2009: 8) — it is important to recognise that, firstly, private actors may also engage in steering activities that contribute to the achievement of policy goals, and, secondly, public and private actors interact in many ways, thus making it difficult to completely exclude private actors from a study on multi-level climate governance (e.g. Hooghe and Marks 2006). Thus, despite this study’s focus on the multi-level interrelationships between different levels of government, we do not completely exclude private actors from our analysis.

We also find it useful to distinguish between multi-level climate governance *frameworks*, i.e. the overarching governance system within which different levels of government interact, and multi-level climate governance *instruments*, e.g. the specific platforms, funding mechanisms, and action plans that are implemented to support climate action at the local level.

Thus, in summary, we arrive at the following definition:

Multi-level climate governance encompasses the structural and institutional setting in which different levels of government distribute roles and responsibilities, coordinate and cooperate on climate action; as well as the specific instruments that are implemented at different levels of government to support and implement local climate action.

1.3 Approach and structure of the study

As outlined above, our objective is to analyse how different instruments for multi-level climate governance can help local governments in leveraging their climate mitigation and adaptation potentials, thus supporting the implementation of national and international climate goals. As political contexts, challenges and opportunities differ across countries and cities,

we expect different multi-level climate governance instruments to be suitable for different contexts. No single instrument will universally improve the ability of local governments to implement climate mitigation or adaptation measures. Thus, to answer our research question we need to understand the *relevance* of different instruments. We look at three interlinked types of relevance:

1. An instrument is relevant for a particular context if it effectively addresses particular “governance gaps” in multi-level climate governance (Charbit and Michalun 2009; Charbit 2011) or improves local “governance capacities” with a view to make the most of local governments’ mitigation and adaptation potential (Bulkeley 2010). These governance capacities—which are outlined in more detail in chapter 2—are: availability and access to high-quality and timely information and knowledge pertinent for decisions on local climate action; adequate finance flows to support local climate action; the ability to ensure coordination and coherence in climate policies and actions both horizontally (e.g. across local jurisdictional boundaries) and vertically (e.g. between national policies and local actions); and adequate institutional capacities to engage in multi-level climate governance, embodied for example in sufficient skilled personnel in local governments and national ministries.
2. An instrument is relevant for a particular context if it responds to the needs and priorities in a particular setting and if it fits with the rest of the instruments employed in this context.
3. An instrument is relevant when it can contribute to and / or be integrated into the global priorities and principles of the international climate regime enshrined in the Paris Agreement. For example, an instrument can be relevant if it supports the achievement of key goals of the Paris Agreement, in particular by contributing to holding the increase of global temperatures to “well below 2 degrees” and to “efforts to limit the temperature increase to 1.5 degrees” (Paris Agreement, art. 2, para. 1a). In this context, decision 1/CP.21 on the adoption of the Paris Agreement welcomes the

efforts of all non-Party stakeholders—including cities and other subnational authorities—to address and respond to climate change and invites them to scale up their efforts (paras. 133, 134). Depending on national political and institutional contexts, instruments may also be relevant if they enable local governments to contribute to the implementation of the obligations of national governments in the Paris Agreement—such as implementing NDCs and increasing their ambition over time (Paris Agreement, art. 3, art. 4).

This study is based on three main sources of data:

(1) An extensive literature review of academic and practitioner sources on multi-level governance, international climate governance, transnational climate governance and cities and climate change; (2) A series of semi-structured anonymous expert interviews between September 2017 and May 2018 with civil servants representing government institutions and responsible for issues related to climate change, NGO representatives and academics;³ (3) Four expert presentations during the event “Supporting Local Climate Action through Multi-Level Governance” held at the GIZ in Bonn during the 23rd Conference of the Parties to the UNFCCC.

To answer our research question and examine the relevance of different instruments for multi-level climate governance for different contexts, our study is structured as follows:

Dimensions of multi-level climate governance: in chapter 2, we summarise the dimensions of multi-level climate governance found in the literature to develop a conceptual framework. The framework addresses the following questions: What are the governance capacities fostered by multi-level climate governance for different levels of government? How do governments engage in multi-level climate governance? Who is involved in multi-level climate governance?

Instruments for multi-level climate governance: in chapter 3, we present a range of different instruments for multi-level climate governance and assess them according to their relevance for local and national governments using a series of guiding questions based on the conceptual framework presented in chapter 2.

3 For reasons of anonymity and confidentiality individual interviewees have not been named.

Our discussion of the different types of instruments includes numerous examples from around the world. Selected examples are discussed in more detail, with a focus on how—and with what effect—they have been implemented in practice.

National frameworks for multi-level climate governance: in chapter 4, we present the general frameworks for multi-level climate governance that characterise different political contexts. Drawing on OECD (2010) and Corfee-Morlot et al. (2009), we distinguish between top-down, bottom-up and hybrid

frameworks for multi-level climate governance, and illustrate these three types by including an exemplary review of the climate or urban development and planning policies in four countries. These four case studies allow us to illustrate the selection of various instruments in the different frameworks and to examine their policy mix related to multi-level climate governance.

In chapter 5 we summarise the **main findings** of the study and present **recommendations**.



2 Conceptual framework: Dimensions of multi-level climate governance

Multi-level climate governance instruments and frameworks differ along numerous dimensions. These dimensions refer to the following issues:

- What are the governance capacities fostered by multi-level climate governance for different levels of government?
- How do governments engage in multi-level climate governance?
- Who is involved in multi-level climate governance?

In this chapter, we summarise the academic and policy literature on these dimensions and develop a conceptual framework for the following chapters. This conceptual framework is intended to guide the

reader in identifying instruments and frameworks for multi-level climate governance that are particularly suitable for supporting local governments in acting on climate change in a specific context.

2.1 What are the governance capacities fostered by multi-level climate governance?

Multi-level climate governance is an attractive approach to support effective climate action. This is because it can strengthen the governance capacities of

governments at different levels. The following governance capacities are of particular importance (Bulkeley 2010, Charbit 2011; Charbit and Michalun 2009):

- **Information and knowledge:**

Information asymmetries are corrected

Access to sufficient, timely and accurate information for correcting information asymmetries can be strengthened through multi-level climate governance and is important to design and implement effective climate policies and measures. For example, national climate policies can be improved through accurate information on the needs, challenges and successes of local climate action and how this is being affected by national policies.

- **Finance:**

Adequate finance is in place

Multi-level climate governance is important to direct and coordinate the flow of sufficient financial resources for climate action. For example, if the ability of local governments to raise their own revenues is limited, then financial transfers from higher levels of government are essential for local climate action.

- **Coordination and cooperation:**

Coherent allocation of responsibilities and mandates is in place and policies of different sectors and at different levels are aligned

Multi-level climate governance can help identify the appropriate scale at which a particular issue needs to be addressed. For example, local governments may coordinate and cooperate on a horizontal level to address issues that transcend jurisdictional boundaries. Coordination is also important to ensure that laws, policies and measures implemented at different levels of government and by different sectors are coherent, and to avoid unnecessary duplications or contradictions.

- **Institutional capacities:**

Adequate human and institutional capacities are in place

Multi-level climate governance can help strengthen the skills of personnel at the local, subnational and national levels. This is necessary to support effective climate action at all levels. For example, local governments require sufficient and adequately trained personnel to apply for the funding opportunities provided by higher levels of government.

National governments need adequate human resources to be able to coordinate climate action across different line ministries.

Governments at different levels may engage in multi-level climate governance to strengthen these governance capacities. The ways in which they engage in multi-level climate governance will differ according to the existing institutional, political and legal frameworks in which they are embedded. By strengthening the governance capacities of local governments, higher levels of government can provide incentives and opportunities for local governments to contribute to the implementation of NDCs and an avenue for institutionalising local efforts into the national and global frameworks.

Understanding strengths and weaknesses in governance capacities can help identify appropriate multi-level climate governance instruments to address any shortfalls and thus improve conditions for local climate action. For example, a local government may have sufficient information to take action on climate change, but lack sufficiently qualified human resources to apply for the funding opportunities provided by subnational or national government. In this context, training programmes for local government employees may be helpful. This could be provided by a range of different actors, such as subnational or national governments, through city networks (which often provide training opportunities for members), or international organisations.

Strong governance capacities are necessary, but not sufficient, to promote climate action by local governments. Even if a local government is in a position to coordinate its activities with other local governments and higher levels of government and has access to sufficient information, well-trained personnel and financial resources, there may still be a lack of political will for climate action. Conversely, a motivated local government may have weak governance capacities but still decide to engage in strong autonomous climate action within its limited means. Thus, improving governance capacities is only one way in which national governments can incentivise local governments to contribute to the implementation of NDCs. National governments may also make climate action obligatory for local governments, for example by making the

adoption of local climate action plans mandatory. However, in the absence of a strong local motivation to act, mandatory requirements from higher levels of government are likely to be met with shallow implementation efforts. The motivation of local governments is also affected by factors such as a normative concern for climate change, the absence of additional costs of engaging in climate action, awareness of co-benefits, and expected “political gains for local leaders” (Krause 2013: 126). Financial co-benefits — “that is, achieving cost savings and attracting external funding and investment” appear to be particularly important (ibid.: 137). This suggests that efforts to communicate the potential co-benefits of local climate action — both financial and non-financial — are an important component of multi-level climate governance.

2.2 How do governments engage in multi-level climate governance?

Countries have adopted different multi-level climate governance frameworks to suit their particular institutional, political and legal contexts.

These can loosely be divided into top-down, bottom-up or hybrid multi-level climate governance frameworks (e.g. Corfee-Morlot et al. 2009; OECD 2010):

- In a **top-down multi-level climate governance framework**, incentives, resources and/or obligations for local governments to engage in local climate action emanate from the national government (OECD 2010). National governments may, for example, develop policy frameworks that require local governments to develop climate action plans. They can allocate concrete targets to them, provide incentives or they might also provide financial or technical support for local governments to help them implement these action plans.
- In a **bottom-up multi-level climate governance framework**, local governments have substantial autonomy to independently implement local mitigation and adaptation measures, and are usually implemented in the absence of national-level policies and support measures (OECD 2010). Ambitious

local governments may also influence climate action at higher levels of government by demonstrating climate leadership and increasing pressure for a stronger consideration of climate issues at the regional or national level.

- A **hybrid multi-level climate governance framework** combines elements of both top-down and bottom-up approaches. For example, the national government may implement policy guidelines to encourage coherence in the actions taken by different local governments. At the same time, local governments may also voluntarily implement ambitious and innovative climate actions that go beyond national policy guidelines. National and subnational governments could also collaborate with local governments to identify successful lessons and innovations in local climate action and diffuse them more broadly (OECD 2010: 209).

Hybrid multi-level climate governance frameworks are often considered particularly promising, as a bidirectional exchange across different levels of government allows lessons learned to be “used to modify and fine-tune enabling frameworks and disseminated horizontally, achieving more efficient local implementation of climate strategies” (Corfee-Morlot 2009: 3). However, top-down, bottom-up and hybrid are best understood as continuous rather than discrete categories.

Within these different multi-level climate governance frameworks, **national governments often combine different modes of governance to encourage local climate action**. For example, governing by regulation occurs when higher levels of government implement binding requirements for lower levels of government (Alber and Kern 2009). Governing by enabling entails the encouragement of local action by higher levels of government through guidelines, awards, benchmarking, etc. (ibid.). Governing by provision occurs where local governments receive incentives such as funding schemes and technical advice (ibid.). Consultation and coordination are important complementary governance capacities to manage the mutual dependency between different levels of government (Charbit and Michalun 2009).

Top-down, bottom-up and hybrid multi-level climate governance are examples of **vertical interactions** across local, subnational, national and/or international

scales (Bulkeley 2010, Corfee-Morlot et al. 2009; Lenhart 2015). Conversely, **horizontal interactions** occur among different actors operating on the same scale (Bulkeley 2010; Corfee-Morlot et al. 2009; Lenhart 2015). Examples include cooperation amongst local governments in city networks, improved coordination among national ministries on issues affecting cities and climate change, and metropolitan governance (Corfee-Morlot et al. 2009: 9).

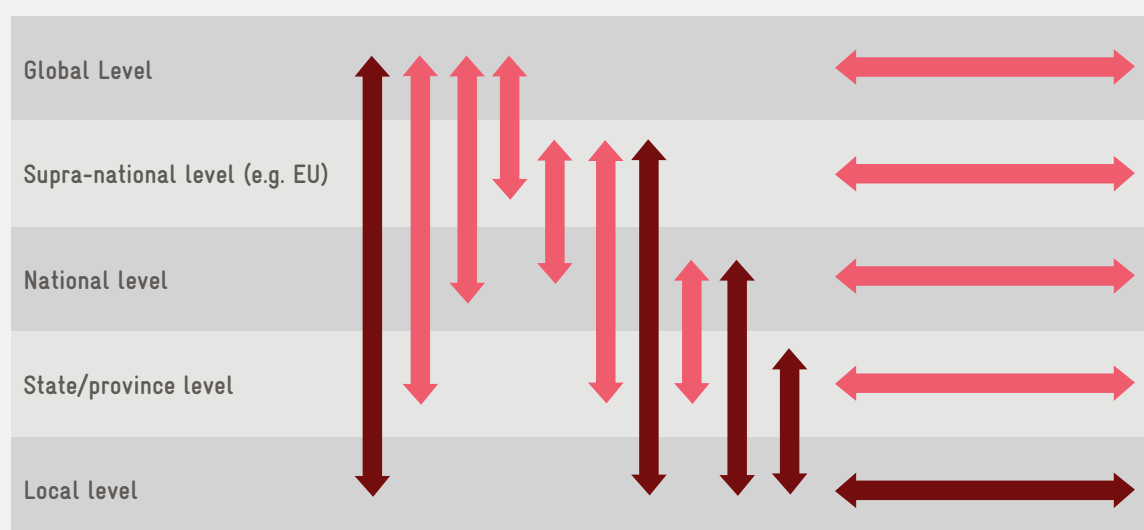
Horizontal interactions amongst local governments, and vertical interactions across levels of government, are beneficial as they can “generate virtuous cycles and positive feedback loops” (Hsu et al. 2017: 429). However, there is no “one-size-fits-all” solution and the extent to which local climate action is vertically or horizontally embedded will be context-specific (ibid.). For example, horizontal interactions amongst local governments may have an important complementary function when vertical interactions are weak (e.g. little or no guidance from the national government) (ibid.). However, the extent of horizontal interactions also depends on favourable national government policies that facilitate local autonomy (ibid.). In this sense, **vertical and horizontal interactions are inextricably linked**.

At the local level, the modes of climate governance employed by local governments depend on the powers available to them to control different assets or functions (C40 and Arup 2015). These powers—classified by the network of megacities C40—may be limiting or enabling factors for local action:

1. the extent to which a city owns or operates an asset/function;
2. the extent to which a city can set or enforce policies/regulations affecting that asset/function;
3. the extent of budgetary control over an asset/function; and
4. the extent to which a city can develop its own vision for a particular asset/function (C40 and Arup 2015).

A local government’s power over an asset or function may range from no control along any of the four power dimensions, to full control over all four dimensions (C40 and Arup 2015). Scoring low on various power dimensions does not necessarily mean that a city will be less able to deliver on climate action (ibid.). Thus, while full ownership and operation of an asset/function offer the best conditions for taking action as

Figure 2.1: Vertical and horizontal interactions



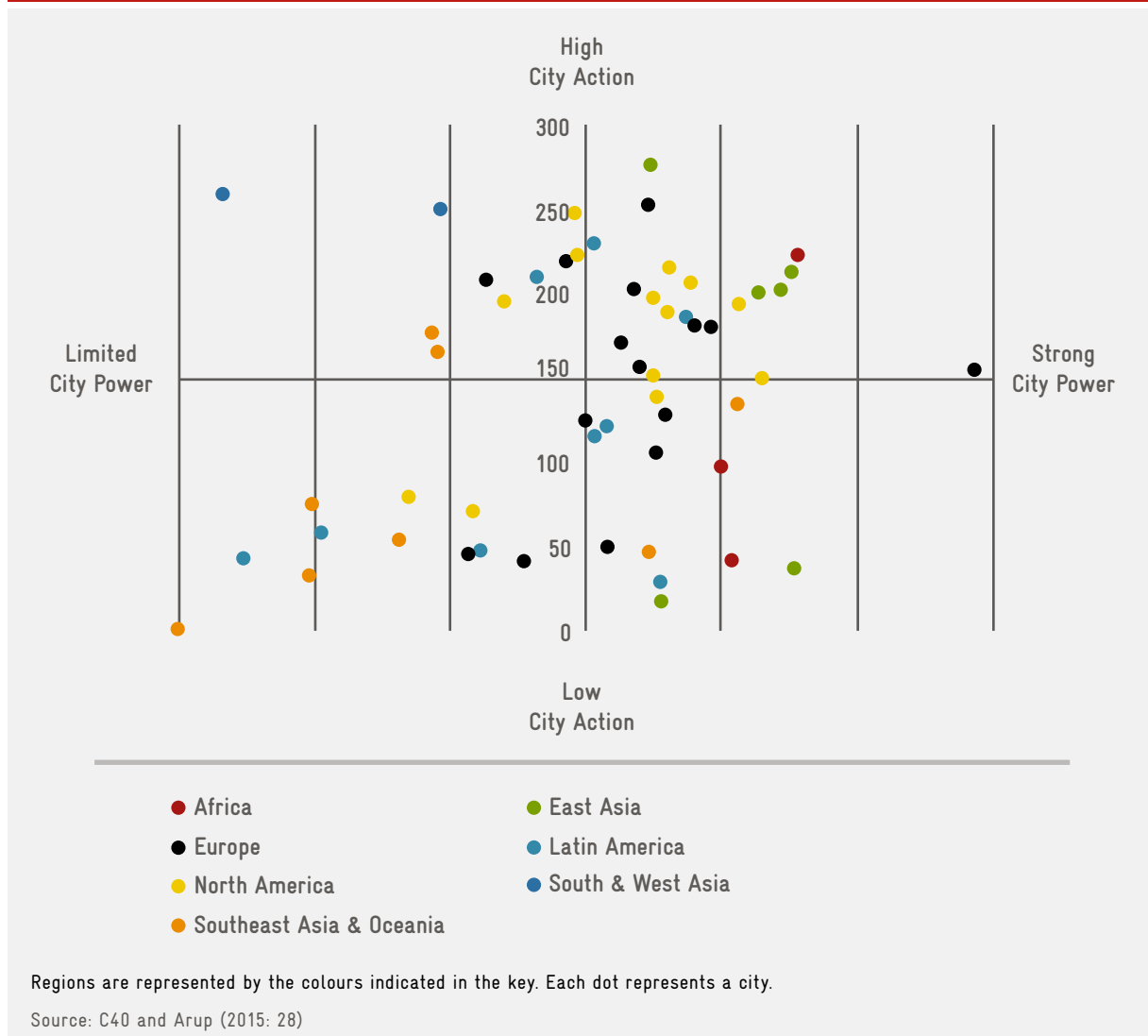
Adapted from Jänicke (2017). The vertical and horizontal interaction types that are the main focus of this study are indicated in a darker shade of red.

cities “can directly control the operation of assets and determine the scale of investments related to climate actions”, cities with less power on certain dimensions can often circumvent these shortcomings (ibid.: 17). For example, if cities have no control over the budget for a certain asset/function, they may still be able to use policies/regulations to require private actors to take action. Thus, a study of C40 found that cities that have limited power over assets have nonetheless implemented 1027 climate actions (around 13 percent of the actions in the dataset) (ibid.: 50). Conversely, cities with high city power are not automatically implementing more climate actions (Figure 2.2).

Collaboration with partners (such as business and civil society) appears to be particularly important in stimulating climate action, and may even be more important than the type or degree of power that cities have over a particular asset or function (C40 and Arup 2015: 48). In fact, cities that collaborate with other partners are overall delivering the most climate actions. However, while cities with extensive controls over assets/functions deliver comparatively fewer climate actions, they are more likely to deliver transformative climate actions (ibid.).

A key implication of the findings from the study by C40 and Arup (2015) is that it is important to examine the powers that cities tend to have in a particular

Figure 2.2: Correlation between city power and action across regions



sector in a particular country when discussing multi-level climate governance instruments that may be suitable to improve local climate action. For example, if cities have limited control over assets and decisions they may benefit from multi-level climate governance instruments that encourage collaboration with partners.⁴ Moreover, where cities have limited control over assets or functions, the onus is on higher levels of government to ensure that these are governed in a manner that is conducive to mitigation or adaptation.

2.3 Who is involved in multi-level climate governance?

Multi-level climate governance can involve a large range of actors. On this dimension, instruments for multi-level climate governance can either exclusively involve governmental actors, exclusively involve non-governmental actors, or a mix of both. Governmental actors primarily include local, subnational and national governments and associated bodies. Non-governmental actors include e.g. companies, civil society organisations, philanthropies, and research institutions.

There is a trend towards increasing involvement of both governmental and non-governmental actors in multi-level climate governance and local climate action. For example, Castán Broto and Bulkeley (2013) find that non-governmental actors account for 24 percent of the urban climate actions in their dataset (which covers 627 climate initiatives in 100 cities). Moreover, multi-level climate governance instruments now strive to involve both actor types. For example, the network C40 has partnerships with a range of companies (e.g. Arup), philanthropies (e.g. Ford Foundation), research institutions (e.g. World Resources Institute), and international organisations (e.g. World Bank).

Involvement of non-governmental actors in multi-level climate governance can be useful at different stages of decision-making to ensure awareness and consideration of different perspectives, promote mutual learning, etc. (Corfee-Morlot et al. 2009). Further benefits of involving such actors include increased legitimacy of the decisions that are made, local buy-in and support for implementation. As mentioned above, collaboration with non-governmental actors may be particularly important for local governments with limited powers to autonomously implement climate action (C40 and Arup 2015).

⁴ The implicit assumption here is that supporting cities in implementing local climate action within their existing mandates, powers and responsibilities is likely to be a more successful strategy in the short term than trying to encourage an expansion of cities' powers.



3 Instruments for multi-level climate governance

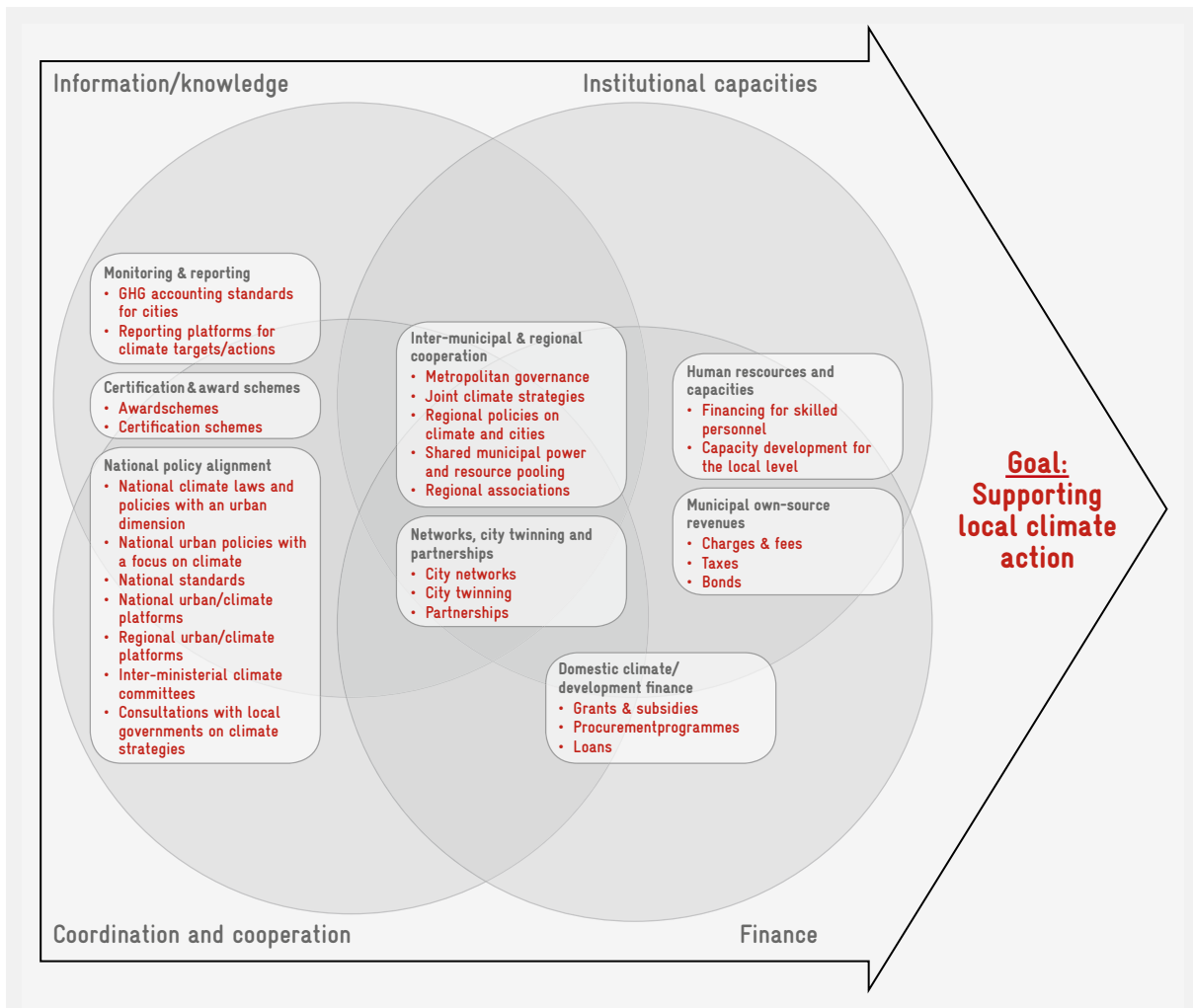
This scoping chapter presents various illustrative examples of instruments for multi-level climate governance. For each type of instrument, we describe its functions and sub-types; discuss the governance capacities that are strengthened by it at different levels of government; describe the actors involved in its implementation; and identify key challenges and opportunities of the implementation of such instruments. In addition, we present a range of examples of different sub-types and provide more detailed case studies of selected examples from across the globe that demonstrate how the instruments have been applied in practice.

Figure 3.1 presents the instruments included in this study according to the governance capacities discussed in the conceptual framework in chapter 2. The relationship between instruments and governance capacities in the figure should be seen as gener-

alisations, as the ways in which a specific instrument strengthens governance capacities is dependent on how it is implemented in different countries. Thus, while we discuss specific instruments in detail in the subsections of this chapter that are arranged according to governance capacities, it is important to bear in mind that the classification of instruments according to governance capacities is rarely straightforward. Moreover, as is illustrated in Figure 3.1, instruments can often contribute to strengthening multiple governance capacities.

While the number and type of instruments covered in this chapter is large, the overview of instruments should be seen as illustrative rather than exhaustive. We have chosen to focus on instruments that are largely shaped by domestic actors, and therefore, for example, exclude international climate and

Figure 3.1: Instruments and governance capacities

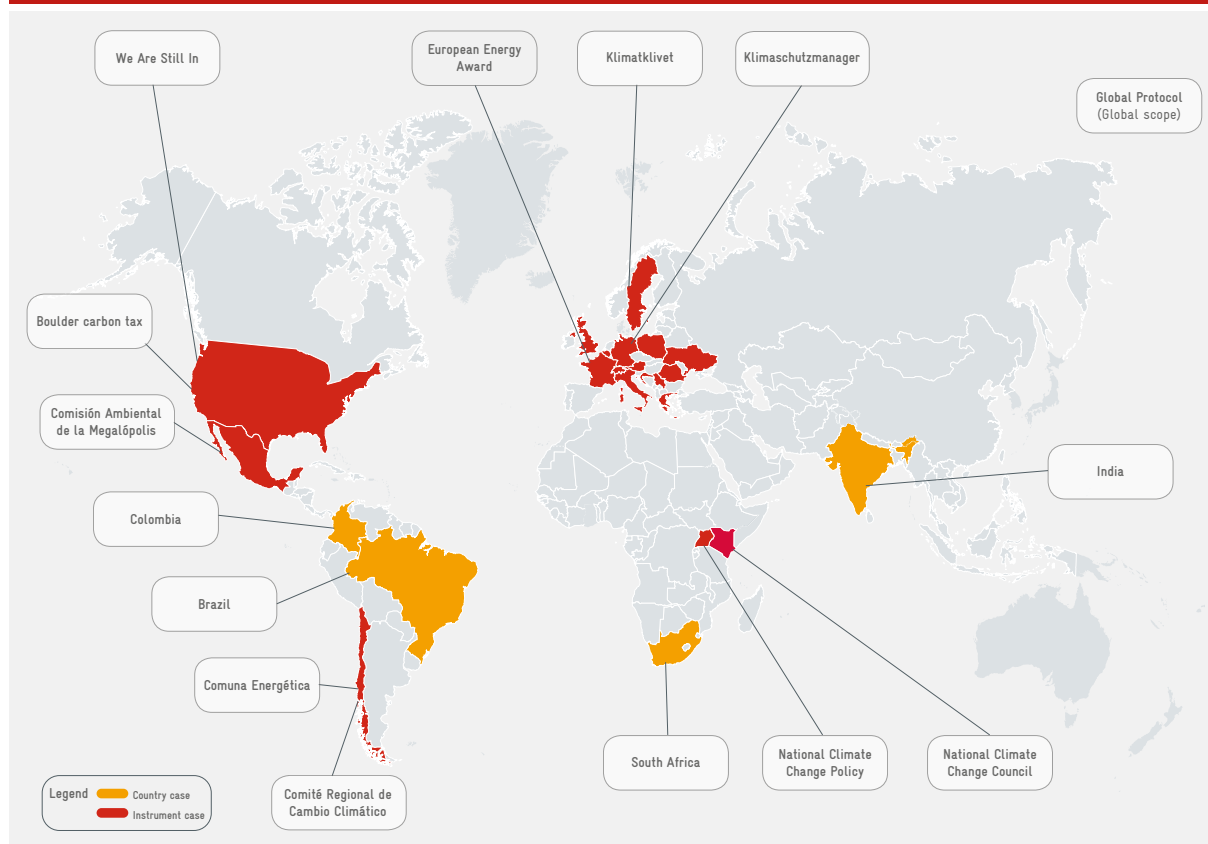


development finance. A good overview of instruments in that category can be found in Tänzler et al. (2017). Figure 3.2 provides an overview of the cases covered in detail in this study. It covers both the instruments covered in depth in this chapter (dark red), as well as the case studies of multi-level climate governance frameworks in chapter 4 (light red). More than 100 additional examples from around the world are presented more briefly to illustrate the diversity of applications of different instrument types.

The instruments discussed in this chapter are analysed according to the following **guiding questions**:

- **Background:** What is the function of the instrument? What are sub-types/variations of the type of instrument?
- **Governance capacities:** How do the instruments support mitigation and/or adaptation action by local governments? What local governance capacities are strengthened by the instrument? What national governance capacities are strengthened? What other benefits arise for different levels of government? What modes of governance to encourage local climate action are at play?
- **Horizontal and vertical interactions:** How is the instrument embedded in horizontal and/or vertical governance interactions?
- **Actors:** Who is involved in the implementation of the instrument? What other actors benefit from it?
- **Challenges and opportunities:** How have selected examples worked in practice? How can the functioning of the instrument be strengthened in the future?

Figure 3.2: Geographic scope of instruments and country examples



3.1 Information and Knowledge

3.1.1 Monitoring and reporting

Monitoring and reporting instruments are essential to track progress on climate action, evaluate key challenges and incentives for implementation at different governance levels, and provide an evidence base for future policy decisions. They include e.g. accounting methodologies that help local governments measure and monitor their greenhouse gas emissions, and reporting platforms through which local governments can register their climate action commitments and/or GHG emissions. Verification currently plays a rather limited role in many existing monitoring and reporting instruments for local climate action.

Monitoring and reporting instruments can help national governments fine-tune their policies so that local governments can better contribute to NDC implementation. Strong monitoring and reporting instruments are essential for the identification of success cases (that should be replicated and scaled up) and laggards (that may need more support to utilise their full climate action potential). A better understanding of local emissions levels and effective local climate policies can also guide countries in increasing the ambition of their NDCs. An important precondition for this is that data collected at the local level is comparable and can be aggregated. However, as is outlined in more detail below, the currently limited use of harmonised indicators and methodologies for the preparation of local GHG inventories hinders the extent to which local emissions data can be included in national inventories (that countries must regularly prepare in the context of the enhanced transparency framework of the Paris Agreement).

For local governments, key benefits of monitoring and reporting include being able to demonstrate their importance as climate governance actors.

With a strong evidence base, local governments can show how they can contribute to the implementation of national climate goals and targets—and why sub-national and national governments should therefore support and enable them to take (more ambitious) action. Moreover, monitoring and reporting can help local governments engage in effective peer learning by identifying success cases that can be implemented elsewhere.

A variety of monitoring and reporting instruments are available to suit the needs of different actors.

For example, city networks such as C40 promote monitoring and reporting of GHG emissions and climate actions amongst their members. ICLEI, the World Resources Institute and C40 cooperate on the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC), which helps local governments to voluntarily conduct GHG inventories according to guidance from the Intergovernmental Panel on Climate Change (IPCC) for national GHG inventory preparation. Moreover, some countries have national programmes for city-scale GHG emission inventories. The wealth of existing monitoring and reporting instruments provides substantial flexibility, as national and local governments and other actors can choose which instruments is most attractive or straightforward for them to apply.

However, this diversity also impedes the relevance of existing monitoring and reporting instruments for multi-level climate governance.

The lack of coherent definitions of local government, community, urban area, etc. hampers the comparability of reported data (Hsu et al. 2016: 304; Corfee-Morlot et al. 2009: 69). Many existing monitoring and reporting platforms also suffer from inconsistent or incomplete data collection, as municipalities are often free to choose which data they report and how, leading to uneven and incomparable data collection efforts (Hsu et al. 2016: 304; see also Corfee-Morlot et al. 2009: 69). Moreover, platforms where municipalities can report or register commitments (such as the Non-State Actor Zone for Climate Action, NAZCA) currently rarely cover the outcomes and performance of the registered initiatives, limiting their value for

measuring progress (Hsu et al. 2016: 305). A further risk is that local governments are overwhelmed by the diversity of available monitoring and reporting instruments and lack the capacity or information to make an informed choice amongst the available instruments.

These shortcomings hamper the extent to which the aggregated impact of local climate action can be clearly demonstrated at the national and international level.

Consequently, it is currently difficult to accurately estimate the overlap between the emissions reductions commitments of national governments and other actors, including local governments and businesses. Estimations of the overlap between the activities of national governments and other actors are as high as 70 percent in 2020 and 80 percent in 2030 (Roelfsema et al. 2018). Thus, accurate assessments of the additionality of climate action by local governments are currently lacking. The current scope of international monitoring and reporting platforms such as NAZCA, carbonn and the Covenant of Mayors for Climate and Energy moreover remains limited, with the cities that have reported to each of these platforms covering less than 10 percent of the global population (and likely significant overlap between the platforms).

Thus, efforts to harmonise monitoring and reporting of local climate action and GHG emissions both within countries and internationally are essential to increase the value and impact of monitoring and reporting.

National governments can have an important role in this context, e.g. by developing national programmes for city-scale GHG emission inventories to ensure that the data collected can be aggregated and compared. Support—for example in the form of technical advice or funding—from national governments, UN agencies, development agencies and other relevant actors can moreover help increase the number of local governments engaged in monitoring and reporting around the world.

Table 3.1: Sub-types and examples of monitoring and reporting instruments

GHG accounting standards for cities	Germany's climate action planner (Klimaschutz-Planer) is an internet-based monitoring tool for cities, municipalities and districts that supports the development of GHG inventories according to a harmonised methodology (Klima-Bündnis e.V. 2018).
	The Initiative for Climate Action Transparency is developing Non-State and Subnational Action Guidance to support interested countries in integrating the GHG emissions and reductions of non-state actors and subnational actors (including cities) in national inventories and NDCs (ICAT 2018).
	The Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) adapts IPCC guidance for national GHG inventory preparation for the community scale (Greenhouse Gas Protocol 2018). It is used by many cities around the world, such as Belo Horizonte (Brazil), Chengdu (China), Rajkot (India) and Boulder (USA).
Reporting platforms for climate targets, climate actions	The carbonn Climate Registry (cCR) and the Non-State Actor Zone for Climate Action (NAZCA) provide platforms where cities can report their GHG reduction commitments and GHG emissions (cCR 2017a; UNFCCC 2017).

Example: Global Protocol for Community-Scale Greenhouse Gas Emission Inventories

The **Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)** is the most comprehensive GHG accounting and reporting framework that is currently available for local governments. It is a joint initiative by ICLEI, WRI and C40, who began developing the GPC in 2011 in a consultative process with city officials, researchers and practitioners (Expert written input). Building on this feedback and testing in pilot cities, the final version of the GPC was released in 2014 (ibid.).

While city scale emissions inventories are nothing new — cities have been compiling them since the 1990s — they are often assembled using different methodologies, leading to difficulties in comparability. Thus, a key objective of the GPC is to promote standardisation, transparency and consistency (Expert written input).

The GPC has been endorsed by a wide range of initiatives, reporting platforms and institutions. This means that it may be the best available option for harmonised urban GHG emissions measurement. For example, the Global Covenant of Mayors for Climate and Energy endorses the GPC to support standardised measurement and reporting of member cities to the carbonn Climate Registry (cCR).

The GPC is moreover consistent with IPCC guidelines, meaning that the data collected can potentially feed into progress tracking at the national and global levels (GHG Protocol 2014). Coherent and consistent measurement of urban emissions through the GPC can also support more extensive inclusion of urban action in NDCs in the future. However, for local GHG inventories to be included in national inventories would require more cooperation by the national level, e.g. in the form of national inventory programmes for city-scale GHG emissions. These are currently quite limited, with France, Japan and South Korea being some of the few examples of countries that have national inventory programmes for city-scale GHG emissions that pre-date the GPC. Moreover, Costa Rica recently became the first country to develop a national inventory programme for city-scale GHG emissions that is based on the GPC, while South Korea is transitioning towards using the GPC for city-level inventories (Expert written input).

Also at the city level, the current reach of the GPC remains limited. Only a fraction of the initiatives reporting the cCR actually use the GPC (cCR 2016). One likely reason for this is the relative novelty of the GPC. It is moreover likely that not all cities using the GPC also report to the cCR, and it is difficult to determine exactly how many cities use the GPC (Expert written input). This is because the GPC is free and

open source, making it difficult to track who is using this methodology (ibid.).

Considering the broad endorsement of the GPC, its relevance is likely to increase in coming years. Moreover, a range of support options are also available to help local governments apply the GPC. This includes, for example, a training programme—the City Climate Planner Certificate Program—which aims to train local government professionals, consultants, and academics/non-profit organisations in the application of the GPC (GBCI 2018).

With respect to the future development of the GPC, its initiators realise that much work will be needed to mainstream the GPC in the coming years. Key challenges include: building capacity at the city level to not only compile inventories but also institutionalise the inventory process such that it becomes a regular event, and to collaborate more with national governments to support national level adoption of the GPC (Expert written input). Moreover, in some cities the (perceived) lack of added value or a lack of incentives may also impede the conduct of GHG inventories at the city scale (Dellas et al. 2018).

3.1.2 Certification and award schemes

Certification and award schemes recognise climate action efforts by local governments. In the case of certification schemes, local governments must typically demonstrate adherence to certain standards, benchmarks, processes and/or procedures, and are certified to acknowledge this achievement. Periodic assessments may be necessary to demonstrate continued adherence with the specified standards, processes and/or procedures. In contrast, awards are typically given to honour outstanding achievements.

Certification is a universally attractive instrument, but the criteria and implementation processes need to be adapted to suit the conditions in different countries. For example, the scope of climate action that is possible for local governments differs across countries according to existing legal, financial and institutional frameworks. The criteria according to which local governments are certified may need to be adapted to reflect this.

Certification and awards may be attractive for local governments for both normative and utilitarian reasons.

The utilitarian reasons include catalysing investment, increased visibility of local governments in the international sphere, increase in recognition value, signalling to citizens that election promises are being met, and better organisation of local governments' staff and technical teams as a result of the process of implementing the measures needed to qualify for certification.⁵ In the case of award schemes, prize money or other benefits associated with the award may also serve as an incentive to participate—and may provide additional finance for future climate action. Local governments may also choose to apply for certification or an award because they identify with the norms and values represented by the scheme and want to support its reach and impact. Thus, despite the fact that certification and award schemes are typically voluntary for local governments, and may be associated with costs, both normative and utilitarian considerations can nonetheless make participation attractive (see also Bernstein and Cashore 2007).

For national governments, award schemes may be an attractive instrument to incentivise, acknowledge and identify good practices at the local level.

Such information may be identified through award schemes implemented by the national government, as well as ones implemented by lower levels of government or non-state actors. Certification schemes have multiple potential benefits from the perspective of national governments. For example, the European Energy Award (eea) encourages applicants to establish a municipal energy management team as a first step towards creating long-term, institutionalised processes to support a shift towards increased energy efficiency and use of renewable energy. In this sense, certification schemes can make a contribution towards the establishment of processes and plans that help local governments contribute to national climate-related targets. More specifically, some certification schemes—such as the eea and the Comunas Energéticas certification scheme that are discussed in more detail below—explicitly try to establish a link between the measures that municipalities can be certified for, and national targets, laws and policies. Thus, such schemes not only clearly contribute to the achievement of national

⁵ Comments by participants at a side event on “Supporting Local Climate Action through Multi-level Governance”, co-organised by the BMUB, GIZ and adelphi at COP 23.

targets—they also provide a clear incentive for national governments to support them.

Systematic evaluations of the impact of certification or award schemes for local governments are currently limited. It is thus difficult to identify what the added value of such schemes is: do they actually incentivise local climate action, or are the local governments that are being certified and awarded simply getting a stamp of approval for things they would have done anyway? Award schemes, due to the fact that only few cities will be awarded, may “offer incentives to already active cities rather than affecting the behaviour of the more passive cities” (Kern and Bulkeley 2009: 322). Whether the same also applies to certification schemes—i.e., that they tend to reach motivated climate leaders rather than cities that are

laggards—is unclear. However, it is reasonable to expect that the value of certification schemes will also increase when more cities are certified according to a certain standard, rather than just a handful, as this creates a certain amount of peer pressure.

In designing certification schemes, the cost of certification and the stringency of the standards are key issues that need to be addressed (e.g. Kalfagianni and Pattberg 2013). For example, the cost of applying for certification may discourage some local governments from applying, even if they formally meet all of the requirements. This concern has been raised with respect to the World Council on City Data, which in 2014 launched ISO 37120, the first certified standard for city data. The costs of ISO certification limit the current relevance of the standard

Table 3.2: Sub-types and examples of certification and award schemes

Award schemes	Germany's Competition Climate-Active Municipality (Wettbewerb Klimaaktive Kommune) awards cities, municipalities and regions for successfully implementing climate actions (BMU 2018a).
	The city network Climate Alliance recognises outstanding climate action by local and regional governments with the Climate Star Awards (Climate Alliance 2018).
	The Association of Southeast Asian Nations (ASEAN) Environmentally Sustainable City Award recognises outstanding efforts to promote sustainable development in cities in the ASEAN region (ASEAN 2018).
	The C40 Cities Bloomberg Philanthropies Awards recognise climate action leadership by cities in five categories: Energy, Mobility, Waste, Adaptation, and City-Wide Action Plans (C40 2018a).
	The European Green Capital Award and the European Green Leaf Award recognise European cities of different sizes for environmentally-friendly urban development and green solutions. Their topic areas include climate change and energy performance, mobility, waste management and circular economy, and water and wastewater management (European Commission 2018).
Certification schemes	In difference to what its name suggests, the European Energy Award (eea) is actually a quality management and certification scheme for local and regional governments in Europe (European Energy Award 2018a). It is implemented in a decentralised manner in 8 European countries, which each have their own national label (e.g. Energiestadt Schweiz, Pacte Climate Luxembourg, Cit'ergie France).
	The European Climate Award (eca) is a new quality management and certification scheme for municipal adaptation efforts that has recently been launched by the German office of the eea. It is modelled on the eea and designed to be applied in parallel (European Climate Award 2018).
	Comuna Energética (energy municipality) is a Chilean energy sector quality management and certification scheme for local governments that is modelled on the Swiss Energiestadt certification scheme (Ministerio de Energía 2018). There are efforts underway to pilot similar schemes in Colombia and Peru.

in many cities and countries (Dellas et al. 2016: 24). Differentiation in certification costs would be one option for addressing such concerns. Moreover, in designing certification schemes the standard that must be achieved to qualify is also important. Too high standards may be discouraging, while a too low standard would limit the effectiveness of the scheme in incentivising climate action and risk greenwashing local governments that are in fact doing relatively little.

In certification schemes that are well-established, with years of implementation, the next step is to gather and assess experiences, make accounting of achieved emissions reductions rigorous and transparent and utilise the visibility and recognition value provided by certification to increase access to climate finance.⁶

Example: European Energy Award and *Comuna Energética* (Chile)

The **European Energy Award** is an energy management and certification scheme for municipalities and regions. The scheme supports participants in systematically planning and implementing energy efficiency and renewable energy measures, and continuously monitoring and improving those measures once implemented. It was established in 2003, based on a Swiss scheme called *Energiestadt* that was established in 1990 (Huwiler 2017: 5). Currently, the eea is implemented in eight countries (Austria, France, Germany, Italy, Liechtenstein, Luxembourg, Monaco, Switzerland), and is being piloted in several other countries (Romania, Ukraine, Belgium, Croatia, Greece, Poland, Serbia, United Kingdom). Similar approaches are also being implemented or piloted in other countries (e.g. Chile, Morocco, Tunisia), and are in the initial stages in some countries (e.g. Peru, Colombia) (Expert interview).

The eea has a strong vertical governance element in it, with each member country having its own national designated authority that manages the process and certification (Huwiler 2017: 5). The strong link between the national and local level is moreover reflected in the fact that the catalogue of measures according to which local governments are certified is adapted in each country to reflect national energy targets, laws and policies. The international office is responsible for

ensuring the necessary harmonisation across the different country systems (Huwiler 2017: 5). Thus, one benefit of the eea is that it provides a minimum level of comparability across the different national certification schemes, but still facilitates some adaptability to different national contexts.

Working towards achieving certification can also have the effect of empowering cities. For example, in Chile, the ***Comuna Energética* scheme** has to some extent empowered the pilot cities to engage in more autonomous action in a country where energy policy is still mostly implemented in a rather top-down manner (although this is beginning to change) (Expert interview). Further incentives for participation include increased visibility and establishing a status as a front-runner on climate action in Chile (ibid.).

A hallmark of the eea and associated country schemes as well as *Comuna Energética* is the intention to create a long-term, institutionalised process. Thus, these processes cover a range of issues, from high-level commitments and to implementation and regular monitoring and evaluation processes. Crucially, the eea process requires that new municipal energy management systems are coordinated by a dedicated team — not just an external consultant that comes in temporarily. Certification is only one step in this process: once cities have reached a certain level of achievement and impacts, they can be audited and certified according to the national eea label (e.g. *Energiestadt* in Switzerland, *Cit'ergie* in France, *Pacte Climate* in Luxembourg, and *Jiha Tinou* in Morocco) (Huwiler 2017: 18). Some countries may also choose to incentivise certification, e.g. by offering more technical assistance, access to subsidies, etc. (ibid: 18; Expert interview).

Efforts to pilot the eea in countries outside of Europe (e.g. in Morocco) and to implement certification schemes inspired by experiences in Europe elsewhere (e.g. in Chile) demonstrate the potential for and interest in replication of this instrument. However, experience has shown that there is a need to adapt the approach to different national contexts. This relates, for example, to the financial means available to local governments, and the extent of their dependence on subsidies from higher levels of government. Moreover, the extent of support needed from national

⁶ Comments by participants at a side event on “Supporting Local Climate Action through Multi-level Governance”, co-organised by the BMUB, GIZ and adelphi at COP 23.

Figure 3.3: Process of the European Energy Award



Source: European Energy Award 2018b

governments differs across countries. For example, the original Energiestadt certification scheme that was developed in Switzerland had a very strong bottom-up element to it, as Swiss local governments were actively involved in shaping the certification scheme, with the national level only becoming involved at a later stage (Expert interview). Conversely, for the Chilean *Comuna Energética* scheme, it was far more important to have support from the national level at an early stage to scale up the process (ibid.). Support from the Chilean Ministry of Energy involves, for example, hosting the office of the *Comuna Energética* scheme, supporting the coordination of the programme, assuring coherence with national energy policies, and communicating the programme to municipalities. Moreover, access to specific funds from the Ministry of Energy that were earmarked for municipalities developing local energy strategies in the context of *Comuna Energética* provided an incentive for municipalities to participate in the scheme (ibid.).

There are also efforts to create regional umbrella awards—such as the eea in Europe—in other regions. This includes, for example, ideas to establish a Latin American Energy Award based on experiences with *Comuna Energética* and early efforts to establish pilot certification schemes in Peru and Colombia (Expert interview).

3.2 Finance

3.2.1 Municipal own-source revenues

Own-source revenues are sources of finance that are raised by local governments, and over whose use they can decide on their own volition, thus increasing their budgetary control. This makes them an attractive source of finance for local governments. Charges and taxes are particularly important sources of own-source revenue. For example, local governments can levy charges for a variety of reasons, such as the delivery of services (e.g. water, electricity, public transit), or development charges imposed on project developers to finance the construction of infrastructure (Tänzler et al. 2017). Taxes can also be charged on various goods and activities, such as property taxes (ibid.). In many countries, property tax and user fees are the most important and reliable revenue streams for local governments (ibid.). However, more lucrative sources of revenue—such as income taxes and sales taxes—are often the prerogative of higher levels of government (ibid.).

Charges and taxes are not ‘climate-neutral’—whether and in what way they are used can impact the ability of the local level to achieve climate objectives (Kamal-Chaoui and Robert 2009: 13).

Thus, on the one hand, municipal own-sources of revenue such as property taxes and user fees can be tailored and used by local governments to generate resources to fund local climate change mitigation and adaptation projects (Peterson 2017: 282). On the other hand,

levying charges and user fees can in and of itself encourage behaviour change to support climate policy objectives, for example through congestion charges, variable parking fees, or graduated unit costs for energy (ibid.). In this sense, taxes, charges, user fees and other source of own-source revenue can be both an instrument for climate action in and of themselves, and a source of finance for local climate action. While

charges are usually earmarked for specific service and infrastructure expenditures, revenues generated from taxes can be used more flexibly for initiatives with collective benefits (e.g. bike lanes, street lighting, and environmental building codes) (ibid.). A solid revenue stream of own sources can also enhance the creditworthiness of a local government and facilitate access to other climate funding mechanisms.

Table 3.3: Sub-types and examples of own-source revenue instruments

Charges and fees	In Amsterdam an increase in parking fees contributed to a reduction in car trips by 14 percent and an increase in cycling by 36 percent (Smith 2013: 297).
	Taipei City's local government has implemented a per-bag trash collection fee programme to encourage households and businesses to recycle packaging. Waste production has been reduced by one-third since its introduction in 2000 (Ecologic 2016).
	User fees are often levied in the transport sector. For example, Singapore introduced an electronic road pricing system to manage road congestion through a 'pay-as-you-use' system. Motorists are charged for using roads during peak hours (Kitchen 2006: 16).
	The U.S. states Oregon and California are testing 'Vehicle Mile Travelled' fees as a mechanism to pay for transportation infrastructure (DuPuis and McFarland 2016: 13).
Taxes	In the Netherlands local governments have been "reforming property tax provisions that favour single-family dwellings or otherwise contribute to sprawl" (OECD 2014: 11).
	In 2007, Boulder became the first city to implement a carbon tax at the municipal level—the Climate Action Plan Tax (City of Boulder 2017a). The tax is levied on electricity consumption by the residential, commercial and industrial sectors.
Bonds	In December 2016, Mexico City issued its first green bond. The bond is intended to pay for measures related to energy efficiency, transport and infrastructure. Other cities that have issued climate bonds or green bonds include San Francisco (low carbon transport) and Cape Town (water and low carbon transport). In some cases, specific sectors within a city issue such bonds. For example, in the metropolitan areas of Los Angeles and New York the Metropolitan Transit Authorities have issued climate bonds to finance investments in low-carbon transport (Climate Bonds 2017).
Energy-Saving Partnerships (Internal Contracting)	The contracting scheme of energy-saving partnerships was developed in 1996 by the Berlin Energy Agency and the Berlin Senate to allow partnerships between public sector agencies and contractors in order to conduct energy savings measures for public sector buildings (e.g. town halls, schools and administrative office buildings). Through the partnership, investments in energy-saving measures are made in the selected public buildings by a contractor and the investment is refinanced by using the energy savings. The energy savings are shared by both partners.
	Similarly, internal contracting (or 'intracting') is a financing scheme where—in the case of intracting for energy measures—a municipal department or municipally-owned company may submit an idea for an energy efficiency or renewable energy measure (Energy Cities 2018). If an evaluation of the proposed measure indicates that the measure is cost-effective, the municipality signs an agreement with the applicant and finances the measure (ibid.). The applying municipal department or company must then begin repayments starting the following year (ibid.). Examples of cities that have successfully applied intracting include Stuttgart (Germany), Agueda (Portugal), Koprivnica (Croatia), and Udine (Italy) (ibid.).

The own-source revenues of most local governments are too limited to finance significant (infrastructure) investments (Tänzler et al. 2017). Especially smaller local governments are often unable to collect sufficient own-source revenues and are thus dependent on intergovernmental transfers or other sources of external funding such as grants, subsidies and international climate and development finance, which can be tied to certain conditions (ibid.). Moreover, the extent to which the own-source revenue available to local governments is used for climate projects (or climate-friendly urban development) will depend on the priorities, mandate and other sources of finance available to a local government (ibid.).

The extent to which local governments can mobilise own-source revenues depends on the existing multi-level governance framework in the country—specifically, on the degree of fiscal, administrative and public sector decentralisation enabled by higher levels of government (UN-Habitat 2016a: 54). Fiscal decentralisation is a dimension of intergovernmental relations that deals with finance. It is composed of several dimensions, including the assignment of expenditure responsibilities to decentralised levels, the allocation of revenue sources to the decentralised level—one of the most important being own local revenues raised by local governments—and intergovernmental transfers from higher levels to the decentralised level (Feruglio and Anderson 2008). The degree of fiscal decentralisation differs across countries, and consequently the revenue generation capacities of local governments also vary considerably. While, for example, in many Latin American countries decentralisation has strengthened the fiscal capacities of local governments over the last two decades, in Africa and Asia most local governments still have limited investment flexibilities as most of their revenues go to recurrent expenditures (OECD 2014: 9). In general, adequate fiscal decentralisation is a framework that does not allow “unfunded mandates” to take root. An unfunded mandate arises when the decentralised levels are assigned political mandates and administrative responsibilities without the corresponding expenditure responsibilities and sources; in other words, “financing should follow functions” (Feruglio and Anderson 2008: section 1.3).

Limitations in the own-source revenues and overall budget available to local governments need not necessarily impede their ability to implement climate projects: partnerships, e.g. with private businesses and investors, can also prove to be a useful means to realise projects (Arup and C40 2015). For example, the city of Amsterdam has implemented new charging points for electric vehicles to reduce CO₂ emissions from motorised vehicles, and has also entered into agreements “with private companies such as Nissan, Renault and Mitsubishi, and car sharing schemes such as Car2Go to facilitate uptake of the services” (ibid.: 43). Other potentially relevant partners that can leverage access to finance are international organisations and transnational networks (Peterson 2017). Moreover, innovative finance opportunities and revenue sources such as municipal borrowing and bonds, direct private investment in local climate projects and public-private-partnerships are becoming more relevant (Peterson 2017; Tänzler et al. 2017). National and subnational governments also have an important role to play in this context as they can establish frameworks to encourage and enable more substantial private sector investment (Barnard 2015). Dialogue across levels of government is therefore essential (ibid.).

Example: Climate Action Plan Tax (Boulder, CO, United States)

In 2007, Boulder (Colorado, USA) became the first city worldwide to pass a carbon tax (carbon taxes have also been implemented by subnational governments, such as British Columbia in Canada, and national governments, such as India). Known as the **Climate Action Plan Tax**, it is levied on residents as well as the commercial and industrial sectors “based on the amount of electricity they consume” (City of Boulder 2017a). It is not levied on the portion of electricity that is generated from renewable sources (wind power) (ibid.).

The tax has the potential to reduce GHG emissions in several ways. Firstly, it incentivises consumers to reduce their electricity use (or purchase electricity from renewable sources) to reduce their energy bill. Secondly, the revenue generated from the tax (up to € 1.5 million annually) is invested in mitigation efforts, e.g. energy efficiency and renewable energy programmes (City of Boulder 2017a). Its clear

successes include the fact that Boulder now has “one of the highest rates of installed solar capacity per capita” in the United States (City of Boulder 2017b: 1).

The carbon tax has a high public approval rating among the citizens of Boulder, 82 percent of whom in 2015 voted to continue the tax until 2023 (City of Boulder 2017a). However, Boulder’s overall efforts to reduce its GHG emissions have also been hampered by the high share of fossil fuels in the electricity generated by Xcel, the electricity provider for Boulder. Displeased with the progress, the local government has sought to municipalise the electric utility by purchasing Xcel’s assets (City of Boulder 2017c). The path towards resolving this issue has been marked by court proceedings and votes on additional taxes to finance the municipalisation process, with a solution still outstanding.

Despite such setbacks, Boulder’s carbon tax and related efforts are prime examples of bottom-up climate action. They are best understood in the context of the general trend of bottom-up climate action in the United States (see also *We Are Still In*, chapter 3.4), which is often understood to be a response to federal inaction on the topic (e.g. Anderton and Setzer 2017).

However, a carbon tax following the model of Boulder is not an option that is available to many cities, as it is dependent on a strong level of decentralisation that includes the devolution of (some) revenue generation capacities. Moreover, even if revenue generation capacities have been devolved to local governments, this does not necessarily mean that they have sufficient human resources and capacities to manage and collect such local taxes (LSE Cities and UCLG 2016: 13). Thus, a local carbon tax is feasible only in combination with appropriate mandates, resources and capacities.

3.2.2 Domestic climate and development finance

If the capacity of local governments to collect own-source revenues and the control over budgets for key assets is limited,⁷ they may require climate and development finance to fully utilise their local climate action potentials (Schwarze et al. 2016).

There are different sources of public domestic finance

for local governments such as intergovernmental transfers and loans from higher levels of government. They can either be directly attributed to climate finance or constitute a general urban development source that can be used to finance projects with climate co-benefits (Cocco and Pant 2013: 17). As the latter is more common, mainstreaming climate objectives into development finance is crucial (World Bank 2010a; Tänzler et al. 2017).

For many local governments, intergovernmental transfers from federal or subnational governments are an important revenue source to fulfil their function and tasks (World Bank 2010a). Whether intergovernmental transfers and grants are earmarked or unconditional (for general purpose) determines the degree to which they can be used to finance climate projects, and the flexibility that local governments have in determining what kind of climate projects to use funding for (Tänzler et al. 2017: 26). By determining the conditions for intergovernmental transfers, national governments can gain influence on sub-national spending and can use them, for example, to “stimulate expenditure in a sector favoured by the national policies” (Cocco and Pant 2013: 20). Some degree of flexibility in the ways that local governments use intergovernmental transfers is useful to accommodate different local contexts (Cocco and Pant 2013; Tänzler et al. 2017). However, intergovernmental transfers are often insufficient, unstable and inadequately designed (Tänzler et al. 2017). This may limit their potential to influence and stimulate local climate action.

From the perspective of national governments, climate finance for municipalities can be an attractive means of incentivising local climate action. For example, many of the examples listed under “grants and subsidies” in the table below make access to finance conditional on mainstreaming climate change into local development plans or proposing ambitious climate projects.

Loans from national or regional development banks or other financial institutions are also highly relevant for local governments, especially to finance large-scale infrastructure projects with high revenue streams (Revi et al. 2009; Tänzler et al. 2017). Such loans can lower investment risks for

⁷ The progressive privatisation of public services is a possible reason why cities may lack budgetary control for key assets (C40 and Arup 2015). In such cases, local governments cannot use budgetary decisions for key assets to promote climate action.

local governments by providing them with credits with more favourable terms (e.g. lower interest rates, longer repayment periods) than loans from private financiers as well as contribute to leveraging private capital (Schwarze et al. 2016: 4; Tänzler et al. 2017: 27). Besides several dedicated climate funds and programmes, most of the funding provided by domestic finance institutions is not directly attributed to climate finance and can only be used to fund climate objectives when they are mainstreamed into public policy objectives (Tänzler et al. 2017: 27).

To make use of the domestic public finance sources that are available to them, local governments require adequate skills, knowledge and human resources (World Bank 2010a). Moreover, while

domestic public finance is a crucial source of finance for local governments, it is insufficient to generate long-term investments, especially in low- and middle income countries (Floater et al. 2017). Consequently, public funding should be used to leverage additional private investments (UN-Habitat 2016a: 182).

Information on whether and to what extent local governments are accessing funds provided by domestic sources has not been compiled globally and is elusive (Petrie 2017). For example, expert estimates indicate that the Green Fund of South Africa is not yet being tapped by local and provincial governments to a significant extent, but this is difficult to confirm through official data (Expert interview).

Table 3.4: Sub-types and examples of domestic climate and development finance instruments

Grants and subsidies	The Philippines People's Survival Fund provides financial support for adaptation projects implemented by local governments and organisations (Government of the Philippines 2018).
	In Sweden the Klimatklivet (Climate Leap) provides financial support for emissions reductions in municipalities and regions (Swedish Environmental Protection Agency 2018a).
	Colombia's National System of Royalties (Sistema General de Regalías) – allocates funds to departments and municipalities based on royalties from the exploitation of non-renewable resources (Government of Colombia 2018a). Though not originally related to climate change goals, for the biannual period of 2017–2018, the allocation of about 5.1 percent of the total was made mandatory for disbursement concretely in the areas of disaster risk reduction and climate change adaptation.
	During the 2010–2011 La Niña, the government of Colombia created the temporary National Adaptation Fund (Fondo Nacional de Adaptación). The government is currently reviewing the potential of establishing a permanent National Climate Change Fund.
	Brazil's National Climate Change Fund (Fundo Nacional sobre Mudança do Clima) offers both non-refundable and refundable (e.g. loans) sources of finance. Sustainable cities and climate change, and urban mobility, are two of the ten sub-programmes of the fund (BNDES 2017).
	Germany has an extensive array of grant schemes to support local climate action. This includes the National Climate Initiative (Nationale Klimaschutzinitiative, NKI), which between 2008 and 2017 has provided more than 560 million euros to support more than 12,500 local climate action projects in more than 3000 municipalities (BMU 2017a). This includes the financial support for municipalities that commit themselves to reduce their GHG emissions by 95 percent (base year 1990) by 2050.
	Other schemes in Germany include the Municipal Climate Action Model Projects (Kommunale Klimaschutz-Modellprojekte) which finances projects in areas such as waste management, energy, transport and agriculture, and Short Pathways for Climate Protection (Kurze Wege für den Klimaschutz), which funds neighbourhood initiatives aimed at informing, connecting, activating or supporting climate friendly everyday behaviour (BMU 2018b, 2018c).
	South Africa has set up the national Green Fund with a Funding Window for Green Cities and Towns with focus areas on sustainable transport, sustainable waste management and recycling, renewable energy and energy efficiency, sustainable water management, sustainable human settlements, and ecosystem services (Green Fund 2017).

	In Quebec (Canada), the Drive Electric Program provides a purchase/lease rebate for the acquisition of electric vehicles (Government of Quebec 2018). Municipalities are eligible to apply for the rebate.
	In Guatemala, the National Law on Climate Change gives Urban and Rural Development Councils the right to mainstream climate change into their policies, plans and projects (Mueller et al. 2017: 30). At the national level, the law permits the Presidential Planning Secretariat and the Ministry of Public Finance to “provide priority funding to those public entities that have included climate policies and actions in these plans, programs, and projects” (ibid.: 30).
Procurement programmes	The South African Government’s Renewable Energy Independent Power Producer Programme (REIPPP) led by the Independent Power producer Office (IPP Office) is a joint initiative of the national Department of Energy, the National Treasury and the Development Bank of Southern Africa (DBSA) (Republic of South Africa 2018). Private providers of electricity from renewable energy are applicable to submit bids to contribute to generation capacity and selected by a public procurement process. Its goal is to increase the electricity supply by investing in infrastructure, while reducing the country’s reliance on fossil fuels. The programme focuses on projects in wind power, biomass, solar power and hydropower. While the primary target of the programme is the private sector, the Department of Energy and the National Treasury collaborates with the South African Local Government Association to promote the involvement of local government in creating an enabling environment for the development of REIPPP projects and to maximise the local benefits.
Loans	In the Philippines, government financial institutions are required to provide local governments with loan packages with concessional terms. An example is the Disaster Management Assistance Fund , which provides financial support for disaster prevention and mitigation, response, relief, recovery and rehabilitation (Municipal Development Fund Office 2018).
	Germany provides loans to municipalities to support the implementation of the National Action Plan on Energy Efficiency (Nationaler Aktionsplan Energieeffizienz). These include several programmes from the German development bank (Kreditanstalt für Wiederaufbau, KfW), such as Investment Loans for Municipalities (Investitionskredit Kommunen), Investment Loans for Municipal and Social Enterprises (Investitionskredit Kommunale und Soziale Unternehmen), Energy-efficient Urban Redevelopment (Energetische Stadtsanierung), and Energy-efficient Refurbishment (Energieeffizient Sanieren) that offer low-interest loans for retrofitting (KfW 2017a, 2017b, 2017c, 2017d).
	In Germany, the Market Incentive Programme (Marktanreizprogramm) is the central programme to encourage increased use of renewable energy for heating or cooling (BMWi 2018). Municipalities are one of the target groups of the programme, and can receive low-interest loans for the construction of e.g. local heating networks that distribute heat generated from renewable sources, or to construct heating plants that use renewable energy.
	Together with the Inter-American Development Bank (IADB), Colombia’s national development bank (Financiera de Desarrollo Territorial SA, FINDETER) created the Platform for Sustainable and Competitive Cities (Ciudades Sostenibles y Competitivas, CSC) to finance urban sustainability projects (e.g. urban footprint assessment, climate adaptation action plans) (FINDETER 2018).

Example: Klimatklivet (Sweden)

In 2015, the Swedish government launched a new subsidy scheme for GHG emissions reduction measures called **Klimatklivet (Climate Leap)**. The scheme supports measures implemented at the local level—for example by municipalities, counties,

companies, housing associations, non-profit associations or universities (Swedish Environmental Protection Agency 2018a). Examples of measures that may be funded include charging infrastructure for electric vehicles, biogas plants, extensions of district heating networks, and cycle lanes or other bike infrastructure (ibid.). Funding applications have to demonstrate a

substantial contribution to GHG emissions reductions, as well as lasting emissions reductions (ibid.).

The *Klimatklivet* has a multi-level application and evaluation process. Thus, all applications are first evaluated at the county level to ensure that they are compatible with county-level climate and energy strategies (Expert interview). Applications are then submitted to the national level for further evaluation (ibid.). County administrator boards are moreover encouraged to promote the *Klimatklivet* in their jurisdiction and encourage suitable institutions to apply (ibid.).

In the evaluation of applications, particular emphasis is placed on additionality. Thus, applications must demonstrate the additionality of the GHG emissions reductions produced by measures funded by the *Klimatklivet*. This also means that only those measures that cannot be funded by any other existing means can be financed through the *Klimatklivet* (Expert interview). In this sense, *Klimatklivet* is designed with the overall policy mix in mind—ensuring that different funding instruments, taxes, etc. complement each other.

The *Klimatklivet* is not the first subsidy scheme for local climate action that was implemented in Sweden. Its key predecessor is the climate investment programme (*Klimp*), which was in operation between 2003 and 2008 (and which was, in turn, preceded by the local investment programme LIP from 1998–2002). While *Klimp* provided funding exclusively to local governments, *Klimatklivet* is accessible to a broader range of local actors (Expert interview). Moreover, while *Klimp* provided substantial funding for ‘softer’ measures, such as outreach, information and public education projects, etc., the *Klimatklivet* has a stronger focus on technological innovations and infrastructure projects, with less funding allocated to such ‘soft’ measures. This focus on more costly infrastructure and technology projects is in part due to a significant increase in funding for the *Klimatklivet* in comparison to *Klimp*.

Overall, the *Klimatklivet* will provide approximately SEK 3.5 billion (€ 328.6 million) in finance over the period 2015–2020 (Swedish Government 2018). By December 2017, 1305 applications had been financed, which together are expected to contribute to annual carbon dioxide reductions of 760,000 tonnes,

with an expected average lifespan of the measures of 16 years (Swedish Environmental Protection Agency 2018b). In total—taking also into account future investments of the *Klimatklivet*—the expected reductions financed by the *Klimatklivet* are estimated to be around 20–25 million tons of carbon dioxide.

The *Klimatklivet* subsidy programme is an example of a national government applying a provision mode of governance in a hybrid multi-level climate governance context. Swedish municipalities “are constitutionally empowered with a significant degree of self-governance” (Hjerpe et al. 2015: 857). Thus, while their ability to implement climate actions differs across sectors depending on their sectoral powers and mandates, overall they have significant leeway in developing their own climate action plans. In this context, *Klimatklivet* incentivises municipalities to engage in ambitious climate action (through financial support, but also the requirement that funded measures are more ambitious than what is required by law, and demonstrate significant and lasting GHG emissions reductions) (Swedish Government 2018).

3.3 Coordination and cooperation

3.3.1 National policy alignment

National policy alignment promotes coherence in the activities of different subnational jurisdictions, coordination across different levels of government, and coordination across different line ministries.

Examples of national policy alignment instruments include (but are not limited to) national climate policies, plans and strategies that clearly address the local level; vertically integrated Nationally Appropriate Mitigation Actions (V-NAMAs) and national urban policies with a focus on climate change. Both approaches are suitable for translating the targets countries have committed to in their NDCs into concrete, multi-level implementation strategies and explicating the roles and responsibilities of national, subnational and local governments. Inclusion of urban issues in the NDCs is also a means of addressing different levels of government in the implementation of national climate strategies. 113 out of 164 NDCs analysed in

a study by UN-Habitat contain at least some references to the urban dimension of climate change (UN-Habitat 2017). Consultation and coordination mechanisms are crucial to ensure that strategies, policies and plans that encourage national policy alignment adequately account for the perspectives of the different actors that are addressed. Similarly, it is crucial that processes for the revision of NDCs are participatory, to ensure that they adequately reflect the potentials of local governments and other actors to contribute to climate action.

In developing policies that promote vertical policy alignment, a balance must be found between encouraging climate action by local governments, and leaving room for experimentation.

National policies can support climate action by encouraging all local governments to adopt local climate action plans, or mainstreaming climate into their existing sectoral policies (UN-Habitat 2016b). They can thus be a means of incentivising local governments to contribute to the achievement of NDCs by making use of the mitigation and adaptation potentials that are available to them. They can also ensure that local governments engage in climate action at all, rather than expecting this to take place at other scales or in other jurisdictions (Broekhoff et al. 2015: 3). National governments may also mandate the adoption of standardised approaches where necessary, for example building codes, or harmonised approaches to monitoring that facilitate comparison and aggregation of local data. However, leaving room for local governments to define their own approaches to climate action is also beneficial, as it allows ambitious local governments to experiment with new approaches that may become models for other local governments. It also lets them adapt national guidelines to their own local context (Broekhoff et al. 2015; OECD 2010). A national policy approach that encourages all local governments to take action is however also beneficial from the perspective of local governments, as it can minimise the risk of leakage if economic activity shifts to municipalities with less stringent climate policies, which could be a risk to ambitious local governments in the absence of an enabling national policy (ibid.).

Consultation and coordination for national policy alignment are important for the success of national policies. Consultation and coordination processes

that promote exchanges across different ministries can incentivise mainstreaming of climate change in the work of different ministries and encourage inter-ministerial collaboration. Consultation and coordination processes that focus on the vertical dimension—by promoting exchanges across different levels of government—allow insights from local governments to be included in national policies (UN-Habitat 2016b; OECD 2016). In the absence of such measures, it would be difficult to ascertain what positive or negative impacts national policies in practice have at the local level. Moreover, if national policies establish mandatory requirements for local governments, for example to develop and implement local climate action plans, then this necessitates appropriate capacities and resources at the local level. If local capacities and resources are lacking, national governments should provide financial and technical support to local governments to help them meet their obligations.

All levels of government can benefit from such consultation and coordination processes. For national governments, they are an instrument to seek feedback on proposed policy options from the public, such as national climate action plans or INDCs, while final decision-making power remains with the authorising institutions (Rotter et al. 2013: 6). In addition, consultation and coordination processes can help the national level in finding acceptance for policies and becoming partners with stakeholders from civil society and the private sector (OECD 2010). Finally, consultation and coordination instruments can support the national level in detecting local needs and implementation capacities as well as maintaining “open channels of information exchange in order to monitor and evaluate policy impact” (Charbit and Michalun 2009: 23). For local governments, consultation and coordination instruments provide channels for communication, advocacy and involvement in co-designing decision-making processes (ibid.). The relevance for the local level, however, depends on the degree of participation. Consultation processes are usually used to ask local stakeholders for comments and suggestions on a specific policy or public document while some other coordination instruments offer the opportunity to negotiate own interest. The latter can be challenging as “top-down thinking is often deeply engrained into the relationship between national and subnational level” (GIZ

2014: 4). Successful consultation and coordination processes not only require adequate financial and human resources—they should moreover be

continuous, institutionalised processes rather than ad-hoc events to allow for regular discussion of current issues (GIZ 2014: 5).

Table 3.5: Sub-types and examples of national policy alignment instruments

National laws, policies, plans and strategies that promote alignment on urban climate issues	China's National Plan for Addressing Climate Change (2013–2020) includes the development of low-carbon pilot projects in local municipalities as one of its main objectives (IEA 2018a).
	Uganda's National Climate Change Policy outlines clear roles for local district governments in the implementation for the policy (Government of Uganda 2015). Local district governments are required to mainstream climate change into their district development plans.
	Denmark's Action Plan for a Climate-Proof Denmark obliges the national government to provide an appropriate framework for municipal climate adaptation (Government of Denmark 2012).
	Japan's Basic Act on Energy Policy provides the overall direction for Japan's energy policy (IEA 2018b). It also specifies the responsibilities of different levels of government.
	Mexico's federal General Law on Climate Change (Ley General de Cambio Climático) specifies the respective roles of the federal and subnational governments. Both states and local governments are encouraged to develop action plans and strategies that establish links across the three levels (Mueller et al. 2017: 25–6).
	The South African National Climate Change Response White Paper —the central policy on climate change in the country—devotes a section to the role of provincial and local government, and specifically mentions bottom-up approaches and the “special needs and circumstances” of localities (NCCRP 2011).
	Since 2013, Guatemala has a Framework Law for Regulating the Reduction of Vulnerability, Obligatory Adaptation to the Effects of Climate Change, and the Mitigation of Greenhouse Gases (Ley Marco para regular la reducción de la vulnerabilidad, la adaptación obligatoria ante los efectos del cambio climático y la mitigación de gases de efecto invernadero) that addresses different levels of government regarding planning and implementing of mitigation and adaptation actions (Mueller et al. 2017).
	The Philippines Climate Change Act requires local governments to address adaptation and prepare Local Climate Change Action Plans (LSE 2018).
	Several countries acknowledge the potential for local climate action in their NDCs . An example is Costa Rica , whose NDC mentions both low-emission strategies for the urban sector, as well as NAMAs for sustainable housing. Brazil is another example, as its NDC mentions improvements in infrastructure for transport and public transportation in urban areas as a means of achieving its climate goals.
	V-NAMAs are vertically integrated Nationally Appropriate Mitigation Actions. The aim of V-NAMAs is to ensure that local and regional governments are adequately involved in the development of national mitigation strategies. Countries that have developed and implemented V-NAMAs include Indonesia and South Africa (GIZ 2013).
	The Austrian Spatial Development Concept provides guidance on spatial planning and development at the national, subnational and local level. Climate change, adaptation and resource efficiency are among its focal areas, and coherence across different levels of government is emphasised (OECD 2016).
	The Spanish Strategy on Local Urban Sustainability (Estrategia Española de Sostenibilidad Urbana y Local), which ensures horizontal and vertical coordination in urban development in Spain, includes mitigation and adaptation as one of its six thematic areas (OECD 2016).
	Germany's national urban policy (Nationale Stadtentwicklungspolitik) includes climate change as one of its core areas of action (Nationale Stadtentwicklungspolitik 2013).

National consultation forums, committees, councils, etc.	The Brazilian Climate Change Forum (Fórum Brasileiro de Mudança do Clima, FBMC) brings together government officials at the federal, state and municipal level and non-state actors (e.g. civil society, business, academia) to discuss issues related to climate change (FBMC 2017). Moreover, an Inter-ministerial Commission on Climate Change (Comissão Interministerial de Mudança Global do Clima, CIMGC) facilitates national coordination on climate change at the ministerial level (MCTIC 2018).
	In South Africa, the Intergovernmental Climate Change Committee is an instrument of policy coordination and consultation across levels of government, while the National Climate Change Committee is a multi-stakeholder mechanism of sectoral coordination among government, civil society, private sector and labour (Parliamentary Monitoring Group 2011)
	In Guatemala, the National Climate Change Council (Consejo Nacional de Cambio Climático) brings together the members of several ministries and other public sector institutions as well as representatives of e.g. the National Association of Municipalities, private sector associations, non-governmental organisations (NGOs) etc. (Mueller et al. 2017).
	Myanmar has established a National Environmental Conservation and Climate Change Committee to coordinate climate action horizontally and vertically, which “is now progressively including subnational committees and, at least in its intentions, should have committees at the Township level” (Capizzi et al. 2017: 8).
	The Vietnam Urban Forum was established in 2003 to coordinate actions by government agencies, donors, and international and domestic organisations on urban development (Vietnam Urban Forum 2018). Moreover, the National Climate Change Committee is an inter-ministerial committee (involving the environment, planning and investment, agriculture, construction, transport, infrastructure and trade ministries) that is mandated with leading, coordinating, harmonising and monitoring climate change and green growth programmes in the country and with international donors.
	In Colombia, the Intersectoral Climate Change Commission (Comisión Intersectorial de Cambio Climático, CICC) makes decisions and coordinates policy on climate change among the Environment Ministry, the Interior Ministry, the Finance Ministry, the Ministry of Agriculture and Rural Development, the Ministry of Mines and Energy, the Ministry of Transport, the Foreign Ministry and the National Planning Department under the Presidency.
	The Philippines Climate Change Commission is tasked with monitoring and evaluating the climate change programmes and activities of ministries and local governments (Office of the President of the Philippines 2018).
	Some countries have organised consultations on their (I)NDCs that included local governments. For example, Peru organised a decentralised public consultation on its proposed INDC, involving e.g. governments at different levels, civil society and indigenous community representatives (Republic of Peru 2015). Israel convened a committee, which included representatives from relevant ministries, business, local government, NGOs, academia, as well as other relevant actors to support the definition of a national emissions reductions target as well as sector specific targets for the country’s NDC (Government of Israel 2015).
	Germany’s long-term climate strategy (Klimaschutzplan 2050) was developed in consultation with state and local governments and a range of private actors (BMU 2016).
	In Argentina, the Gabinete Nacional de Cambio Climático meets regularly to coordinate on policy issues related to climate change. Its different working groups are divided between technical thematic groups and a working group with ministerial focal points (Ministerio de Ambiente y Desarrollo Sustentable 2016).

Regional consultation forums, committees, councils, etc.	Chile has established Regional Climate Change Committees (Comité Regional de Cambio Climático, CORECC) to support the implementation of climate mitigation and adaptation actions at the regional and local level (Government of Chile 2017).
	The coordination of issues related to climate change policy is led by two bodies in Colombia, the Regional Nodes on Climate Change (Nodos Regionales de Cambio Climático) and the Inter-Sectoral Commission on Climate Change (Comisión Intersectorial de Cambio Climático). The nine Regional Nodes across the Colombian territory were created by presidential decree to promote, guide and support the implementation of climate change policy, strategies and programmes (Government of Colombia 2018c). Their objective is to co-ordinate among regional institutions in each region and with the national level.

Example: National Climate Change Policy (Uganda)

Climate change already has a very real impact in Uganda. For example, temperature increases and increases in the number of hot days have resulted in the spread of malaria to more areas of Uganda (Government of Uganda 2015: 6). More erratic rainfall seasons, with “heavier and more violent” individual rainfalls have led to a rise in the number and intensity of floods and landslides (ibid.). At the same time, droughts have also become the “most significant climate-related change being experienced by Uganda” (ibid.). Thus, in recent years, interest in climate change has been growing, and the adoption of the **National Climate Change Policy (NCCP)** is emblematic of this (Bird et al. 2016: 6). The NCCP is an example of policy aligned that focuses on “adaptation, mitigation, research and observation”, with a strong focus particularly on adaptation, which is unsurprising given the abovementioned adaptation challenges (Friis-Hansen et al. 2013: 23).

Uganda adopted substantial decentralisation reforms in 1993 (Decentralisation Act). The NCCP also embraces a decentralised approach to the implementation of climate policy, specifying “roles for local governments in the planning, budgeting and implementing of low-carbon climate actions” (Tait and Euston-Brown 2017: 47). It moreover requires each district local government⁸ to integrate climate change into its district development plan (with the support of national level departments), and calls for the establishment of district level climate change focal points that are anchored in the natural resources department of each district local government

(Ministry of Water and Environment 2015: xi). The mainstreaming of the NCCP at the district level is supported by the Ministry of Local Government (MoLG) in particular, which is moreover tasked with reviewing the implementation of the district development plans (ibid.: 42). At the national level, district authorities are represented in the National Climate Change Advisory Committee, which advises the Policy Committee on Environment (PCE) that coordinates policy implementation and information flows on resource allocation (ibid.: xi).

Despite this promising policy framework, studies indicate that implementation has thus far been limited (Ampaire et al. 2017; Bird et al. 2016; Tait and Euston Brown 2017; Turmushabe et al. 2013). Firstly, coordinated implementation of the NCCP at the national level is hampered by overlapping responsibilities and weak linkages across ministries (Ampaire et al. 2017). For example, the responsibilities of integrating climate change in national planning, and monitoring implementation, are assigned both to an inter-ministerial body—the National Climate Change Commission—and the national planning authority (ibid.: 85). Secondly, vertical coordination of implementation is currently ineffective. Reasons include the limited ability of district authorities to meaningfully participate in national coordination workshops, e.g. due to delays in sharing draft documents to solicit inputs, and invitations to participate in consultation workshops being sent out on short notice (ibid.: 84). Indeed, while the NCCP outlines engagement opportunities such as the National Climate Change Advisory Committee, specificity regarding issues such as the meeting

⁸ Uganda is divided into four administrative regions, which are further sub-divided into 121 districts. These districts, in turn, are sub-divided into 167 counties, 23 municipalities and one city council (Kampala). These are further sub-divided into sub-counties. The four regions do not have a specific administrative role, while the district local governments are the key subnational government units referred to in the NCCP.

frequency and mandate of the committee are limited (Expert interview).

At the city level, a lack of human and financial resources as well as limited discretionary power and autonomy that result from incomplete implementation of the decentralisation reforms are key issues that limit the capacity to act (Ampaire et al. 2017; Tait and Euston Brown 2017; Expert interview). However, there are indications that prospects for future implementation are improving. For example, although total expenditure on climate change in Uganda has thus far remained far below the goal of 1.6 percent of GDP that is outlined in the NCCP, “policy narratives on funding with regard to volume, sources and delivery mechanisms are only now beginning to emerge” (Bird et al. 2016: 6). Moreover, the NCCP has promoted the development of new institutional structures and responsibilities for mitigation and adaptation action, which has contributed to a strengthened awareness of climate issues (Expert interview).

Example: National Climate Change Council and National Climate Change Directorate (Kenya)

Kenya adopted a new constitution in 2010 (Government of Kenya 2010), which introduced a two-tier system with a central government and 47 semi-autonomous county governments composing the sole subnational level (adelphi and ILEG 2018; Expert written input).

The **National Climate Change Council (NCCC)** and the **National Climate Change Directorate** (formerly the Climate Change Secretariat) are examples of vertical and horizontal national-level coordination mechanisms established on Kenya’s National Climate Change Action Plan of 2013 and by law on the Climate Change Act of 2016. The NCCC is chaired by the President and has the role of “primary coordination, policy direction, oversight and guidance across all levels of government” (Government of Kenya 2013: 102) and of ensuring “mainstreaming of the climate change function by the national and county governments” (Government of Kenya 2016, para. 6a). It has the ability to call on climate change experts, representatives of the national level and county governments, as well as actors from civil society, academia

and the private sector for advice. It reports directly to the National Parliament (Government of Kenya 2013).

The Council is constituted by no more than nine members appointed by the President, including—at the national level—the Minister of the Environment, the Secretary of the Treasury, the Minister of Economic Planning and Development, and the Minister of Energy. Crucially, the chairperson of the Council of Governors is also part of the Council, representing the entire subnational level composed of 47 counties. In addition, one representative of each of the following sectors of society can have a seat at the Council: private sector, civil society, marginalised community and academia (Government of Kenya 2016).

The Directorate is located within the Ministry of Environment and Natural Resources and has the technical responsibilities of proposing and revising climate policy to the NCCC, overseeing the national climate change strategy and action plan implementation, proposing climate change legislation, and enforcement of compliance on issues related to climate change (Government of Kenya 2013). Crucially, it has the responsibility to provide support and engage the county level.

Example: Comités Regionales de Cambio Climático (Chile)

In recent years, Chile has established a strong policy framework for climate change. This includes its recently updated National Action Plan on Climate Change 2017–2022 (*Plan de Acción de Cambio Climático*). Another key document is the National Adaptation Plan (*Plan Nacional de Adaptación*) that is in force since 2014. Moreover, sectoral plans are being developed to support the implementation of Chile’s NDC. This includes a plan with a particularly strong focus on urban issues, the Climate Change Adaptation Plan for Cities (*Plan de Adaptación al Cambio Climático para Ciudades*), which was developed throughout 2017 with public consultations, and is scheduled to be approved in early 2018 (Expert interview). Several other sectoral plans, including the one for the energy sector (to be approved in 2018) and the one for infrastructure (approved in 2018) also have a strong urban component (Expert interview). A strengthened institutional framework is being

established to support the implementation of these policies and plans, which also includes **Regional Climate Change Committees** (*Comités Regionales de Cambio Climático*, CORECC). Thus, while Chile is a unitary state that has in the past only devolved little power to subnational authorities, the CORECCs are emblematic of a trend towards greater decentralisation, strengthening both the regional and the local level (Tänzler et al. 2017).

The CORECCs are an example of horizontal coordination mechanisms at the subnational level chaired by the regional intendants, who are appointed by the President of Chile. Actors represented in the CORECCs include the regional governments, regional councils, provincial governorates, climate change focal points of the regional ministerial environment secretaries, other delegates from regional ministerial secretaries, the inter-ministerial technical team on climate change (*Equipo Técnico Interministerial de Cambio Climático*, ETICC), the agency for sustainability and climate change, municipal representatives, representatives of the regional consultative councils and other participants that are decided on by each CORECC (Expert interview; Government of Chile 2017).⁹

The aim of the CORECC is to support the integration of climate change in policies at the regional level, while ensuring coherence both with existing regional development strategies and sectoral policies, as well as national policies (Expert interview; Government of Chile 2017). The tasks of the CORECC include, inter alia, supporting the institutionalisation of climate change at the regional and local government level, e.g. by establishing a permanent position for a climate change manager, or a climate change unit (ibid.). They are also supposed to support future improvements in the legal and institutional framework for climate governance by supporting the analysis of the strengths and weaknesses of existing legal and institutional frameworks at the regional and communal level (ibid.).

By the end of 2018, all regions are supposed to have established their CORECCs, along with work plans, regional adaptation and mitigation priorities, and means of fostering participation by stakeholders (Government of Chile 2017). Thus, at the moment,

the CORECCs are still an emergent feature in the institutional landscape of multi-level climate governance in Chile, and their effectiveness remains to be seen. However, from the perspective of multi-level climate governance a promising feature of the CORECCs is their broad participation. By bringing together representatives from national level ministries, as well as the regional, provincial, and municipal level, the CORECCs can help strengthen coordination and flows of information across levels of government. Moreover, the opportunity to involve other stakeholders—such as representatives of business, academia, and civil society—can strengthen the inclusiveness of these committees. A challenge will be ensuring efficient and coordinated action with so many stakeholders involved.

3.3.2 Inter-municipal and regional cooperation

The main purpose of inter-municipal and regional cooperation is to address issues that transcend jurisdictional boundaries by coordinating competencies at new scales. While inter-municipal cooperation involves two or more municipalities working together in a wider geographical region, regional cooperation can entail the involvement of the regional governance level (regions, provinces, counties) (Knieling 2006; Lenhart 2015). This category includes both highly institutionalised instruments with strong “organisational hierarchies and clear competence boundaries”, as well as “relational and contractual schemes”, such as joint strategies and inter-municipal contracts (Subirats 2017: 88). The latter may be particularly suitable for transversal, multidisciplinary and complex issues with an inherently dynamic nature, for which more rigid structures can prove to be dysfunctional (ibid.).

Inter-municipal and regional cooperation can improve the effectiveness of local climate action (Teles and Kettunen 2016; Corfee-Morlot 2009). For example, local climate challenges are rarely constrained by administrative boundaries and can often be more effectively addressed when expertise and power are bundled and a coherent regional strategy is developed (e.g. in the case of transport, water

⁹ Regions are the first level administrative divisions of Chile, provinces the second level, and communes the third level administrative division.

management, disaster risk management) (Alber and Kern 2009). By joining forces, local governments can improve their control over an asset or function and are able to deliver action directly (Allers and van Ommeren 2016). Inter-municipal cooperation can also integrate spatial planning when climate-relevant functions and flows fall beyond cities' administrative boundaries, creating a spatial mismatch (OECD 2010; Bulkeley 2010). For example, land zoning in metropolitan areas defines which areas can be used for residential, commercial, industrial or other purposes. It also affects the extent to which a metropolitan area is characterised by urban sprawl—or compact urban development. This, in turn, affects the amount of time inhabitants must spend to travel between home and work, to go shopping or engage in leisure activities; and the extent to which inhabitants are dependent on motorised transportation or can commute by foot, bike, or public transit. Considering the benefits of such coordinated action across core and suburban areas, major metropolitan areas such as London, Hanover, Portland, and Manila have chosen to develop climate mitigation and adaptation strategies at a metropolitan scale.

Inter-municipal and regional cooperation can also improve the efficiency of local climate action. For example, by joining forces local governments may be able to reduce the costs of service delivery and utilise economies of scale and scope, which can be particularly important for smaller municipalities (e.g. shared investments in infrastructure, joint financing and operating of public services, shared administrative costs) (Corfee-Morlot 2009; Teles and Kettunen 2016). These forms of cooperation can provide institutional structures to divide tasks according to appropriate expertise and coordinate competencies between jurisdictional boundaries (Corfee-Morlot 2009; Teles and Kettunen 2016).

Cooperating with other municipalities or the regional level moreover enables local governments to access information and knowledge as well as greater technical and financial capabilities (Corfee-Morlot 2009). For example, collaborative arrangements such as Subnational Pooled Financing Mechanisms (SPFMs) can provide joint access to private capital markets or public sector funding for local governments with, individually, limited financial expertise and credit ratings (FMDV 2016).

National governments often have a key role in setting up the frameworks that are conducive to effective inter-municipal and regional cooperation (Council of Europe et al. 2016). However, this depends on the context (ibid.). Examples of national governments that have supported the initiation or scaling-up of inter-municipal or regional partnerships include the Philippines, where the Metropolitan Manila Development Authority was established by Presidential Decree by President Marcos. Another example is Canada, where the Department of Natural Resources provides financial incentives for regional collaboration on adaptation. These two examples also illustrate how national governments can encourage inter-municipal and regional cooperation—through mandatory regulations, or incentives.

The shape, function and objectives of these instruments vary widely across countries, depending on the context of the governance framework. Mobilisation for inter-municipal and regional cooperation can be both bottom-up and top-down. For example in the case of Usseroed Creek, three Danish municipalities initiated a joint climate adaptation strategy, a project which was later financed by the EU's Life programme. By contrast in Canada, the Regional Adaptation Collaboratives originated top-down (Bauer and Steurer 2014). Most of the identified approaches are voluntary, but the case of Metro Manila was a command-and-control approach. The Council of Europe (2010: 5) argues that in centralised states “there is little need for common local action” because municipalities in this type of system tend to have “few competencies and limited resources.” According to this argument, the more autonomous municipalities are, the more opportunities for cooperation with other municipalities arise. However, the contrary argument can also hold true: municipalities with fewer competences might want to collaborate with others precisely in order to gain more control over functions (as well as financing and knowledge).

Democratic legitimacy and quality may be hampered by arrangements that reshape spatial jurisdiction and authority. It has been hypothesised that in practice, it may be difficult for inter-municipal cooperation processes to retain democratic legitimacy, since these processes lead to “a dispersal of political power [among the different members] and to a loss of importance of traditional elected bodies in making

decisions” (Schwab et al. 2001: 12; see also Buser 2013, Zimmermann 2014). However, the evidence on this issue is inconclusive, and empirical analyses

have come to different results (Schwab et al. 2001; Zimmermann 2014).

Table 3.6: Sub-types and examples of inter-municipal and regional cooperation

Metropolitan governance	Metropolitan Manila encompasses 17 individual local government units (LGUs). These are coordinated by the Metropolitan Manila Development Authority , an agency that was established by presidential decree in 1975 with the purpose of creating “an integrated unit [...] for simultaneous and unified development” (Government of the Philippines 1975). The body was established with mandates of coordination and operation on areas related to climate change mitigation and adaptation: solid waste management, transport, water supply and sewerage and disaster risk management (ibid.). The 17 local governments units are also members of the Metro Manila Disaster Risk Reduction and Management Council (Miller and Douglass 2016).
	Jing-Jin-Ji in northern China is the metropolitan capital region encompassing Beijing, Tianjin and Hebei , home to more than 100 million people and an economic powerhouse that relies on heavy industry and has dismal air quality records. In coming years, the Chinese government is expected to make massive investments in the realisation of a megacity strategy in this region, particularly through an overhaul in transportation that will allow commuting times to reduce dramatically, improve efficiency and avoid GHG emissions (Montague 2016; Eakin 2015).
Joint climate change strategies	Municipal governments can jointly develop issue-based strategies such as joint climate adaptation plans for one region. For example, within the three municipalities in Demark–Fredensborg, Hoersholm, and Rudersdal–have joint forces and prepared an environment and climate adaptation strategy to govern their shared watercourse—the Usseroed Creek (Hagerup and Pallesen 2016).
	Mandated by the Bremen Law of Climate Protection and Energy, the process of creating a joint concept for climate change adaptation of Bremen and Bremerhaven started in 2016 in order to strengthen the resilience of the regional system in north-western Germany (Municipality of Bremerhaven 2016).
	In Finland, where the preparation of climate strategies at the municipal level is voluntary with no state funding available, the smaller municipalities of Järvenpää, Kerava, Mäntsälä, Nurmijärvi, Pornainen and Tuusula—also known as the KUUMA municipalities in the Central Uusimaa region—pooled their resources to draw a joint climate strategy (Juhola 2010).
Regional policies on climate change and cities	In Victoria (Australia), the Climate Change Framework includes a range of actions to foster mitigation and adaptation and emphasises cooperation with local government (State Government of Victoria 2018).
	Chiapas (Mexico) has established a Law for Adaptation to and Mitigation of Climate Change (Ley para la Adaptación y Mitigación ante el Cambio Climático en el Estado de Chiapas) which also specifies requirements for municipalities with the state, including the formulation and implementation of municipal climate change plans and programmes (Kehew et al. 2013: 730).
	Colombia’s departments (departamentos) are developing their own regional plans guided by the national Ministry of Environment and Sustainable Development (Ministerio de Ambiente y Desarrollo Sostenible, MADS). These Planes Integrales de Gestión del Cambio Climático Territoriales (PIGCCT) have been developed in the departments of Atlántico, Magdalena, Quindío, Cesar, Cauca and Santander.

Shared municipal power and resource-pooling	In Ecuador, several municipalities have delegated some of their functions and powers to mancomunidades , a local entity within the national legal framework (Mueller et al. 2017: 7).
	In the United States, public authorities such as local governments may form a joint powers authority (JPA) and together exercise a shared power. For example, in the San Francisquito Creek JPA several local governments collaborate on climate adaptation issues such as flood risk protection (San Francisquito Creek JPA 2018).
	Local governments can collaborate financially, for example through Subnational Pooled Financing Mechanisms (SPFMs) that allow them to jointly access loans, bonds and other forms of finance. SPFMs may help local governments that individually lack the credit history or financial scope to access such finance to do so collectively (FMDV 2016). Examples of SPFMs can be found e.g. in India (Tamil Nadu Urban Development Fund, Pooled Finance Development Fund scheme), Mexico (Bond Bank of the State of Hidalgo), Kenya (K-Rep pooled fund), and the Philippines (FMDV 2016: 14).
Regional associations	Colombia's Regional Autonomous Corporations (Corporaciones Autónomas Regionales, CARs) are legal entities with joint authority at the regional level composed by jurisdictions in the same geographic or hydrographic ecosystem. Some CARs have started discussing and implementing actions on climate change. For example, the Corporación Autónoma Regional del Alto Magdalena and the Corporación Autónoma del Río Grande de la Magdalena are involved in REDD+ initiatives (REDD Desk 2017). The CARs are established with financial and administrative autonomy and legal identity and for environmental objectives. This legal form exists in the country since 1993 and is established by law.
	Canada's Regional Adaptation Collaboratives (RACs) is a federal-provincial cost-shared programme with the goal to "catalyse coordinated and sustained adaptation planning, decision-making and action" and for capacity development at the provincial and community level (Department of Natural Resources 2017). The RACs receive 50 percent funding from the federal level, and 50 percent funding from the RAC province partners (Bauer and Steurer 2014: 123). The governing bodies of some of the RACs, for example that in British Columbia, also have the participation of officials from municipal authorities, First Nations and tribal councils (Fraser Basin Council 2017).

Example: Comisión Ambiental de la Megalópolis (Mexico)

The **Environmental Commission of the Megalopolis of Mexico** (*Comisión Ambiental de la Megalópolis*, CAME) is an administrative organ that integrates the federal government of Mexico (represented by the Ministry of Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*, Semarnat), the government of Mexico City and the state governments of Hidalgo, Mexico State, Morelos, Puebla and Tlaxcala (Government of Mexico 2013; Expert interview). Recently, the state of Querétaro entered the process to become part of the CAME (El Universal 2017a).

It has the purpose of coordinating administration, planning and implementation of actions "for environmental protection, preservation and restoration of

ecological balance, transport, water and wastewater service, solid waste management and public safety" in the urban region of the Mexico Valley surrounding Mexico City—one of the ten largest urban agglomerations in the world (Government of Mexico 2013, para. I). The main emphasis in the work of the CAME is to preserve air quality in the region (Expert interview). The Commission envisions the cooperation among all national-level ministries and with a group of specialists to conform a scientific advisory committee (Government of Mexico 2013, clause 9). Initially, the participation of other sectoral ministries in the CAME was not foreseen, but given the importance of coordinating with other sectors for the effectiveness of pollution-reduction efforts, since the CAME's creation three ministries have been incorporated: the Ministry of Transport, the Health Ministry and the Ministry of Urban Development (Expert interview).

At the centre of the motivation for the establishment of this institution is the reduction of atmospheric pollution through traffic restrictions, control of fires and the establishment of “electro-mobility corridors”, which foresees the construction of 28 new electric vehicle charging stations” (El Universal 2017b). In addition, the CAME allows coordination among these government entities in solid waste management, in integrating a unified GHG emission inventory.

Although mainly pursuing air quality objectives, the activities of the CAME are consistent with actions that mitigate climate change. The work of the CAME is underpinned by the Federal Programme to Improve Air Quality in the Megalopolis of 2017, which has been aligned with the National Air Quality Strategy, which was elaborated in collaboration with the National Institute of Ecology and Climate Change (Expert interview; Government of Mexico 2017).

The CAME was created in 2013 following institutional precedents that gradually established geographically wider and more institutionalised environmental bodies in the region: the Commission for the Prevention and Control of Environmental Pollution in the Metropolitan Area of the Mexico Valley of 1992, signed by the federal government, Mexico City (Distrito Federal) and Mexico State (Roccatti 2007; Government of Mexico 2013), and the subsequent Metropolitan Environmental Commission of 1996, which encompassed Mexico City, 125 municipalities of Mexico State and 84 municipalities of Hidalgo State (Roccatti 2007).

Although key for one of the strongest local governments in the country (Mexico City), the Commission was established in a top-down manner by presidential decree. The Board of Directors includes the Minister of Environment and Natural Resources, the Governors of the States and the Mayor of Mexico City (Comisión Ambiental de la Megalópolis 2017). The Commission has an Executive Coordinator and a Scientific Advisory Board (Government of Mexico 2013). One of the challenges in the operation of the CAME is the difficulty in achieving consensus because the six city and state governments encompassed in the Commission come from different ideological standpoints and represent the three main political parties in the country (Expert interview).

3.3.3 Networks, city twinning and partnerships

Local governments and their partners have in recent decades implemented a range of different partnerships, networks and city twinning initiatives. Acuto and Rayner (2016: 1149–50) define city networks as “formalised organisations with cities as their main members and characterised by reciprocal and established patterns of communication, policy-making and exchange”. In contrast, city twinning can be understood as a specific form of cooperation wherein two cities engage in exchanges on issues that are of mutual interest, while the term partnership is broader and refers to a form of collaboration that need not necessarily include cities as partners: it could be a partnership among other actors interested in supporting local climate action. In practice, these three instruments often overlap. For example, ICLEI—a network with more than 1500 member cities, towns and regions—also maintains partnerships with international organisations, non-governmental organisations, research institutions, other city networks, and private companies. City networks also often facilitate twinning amongst cities. For example, the Covenant of Mayors for Climate and Energy has launched a twinning programme for mentoring and peer-to-peer exchanges amongst cities (Covenant of Mayors 2017).

By supporting exchanges among local governments and enabling them to share information, knowledge and lessons learnt with each other, city networks, partnerships and city twinning initiatives can support the development of skills and capacities of municipal employees with respect to climate action. A key advantage of networks, partnerships and similar instruments is their flexibility: they can be adapted to cater to a range of different priorities of local governments, depending on their specific needs. Particularly city networks can also improve both horizontal and vertical coordination and coherence, for example where cities develop shared GHG emission reduction targets (horizontal), or where city networks represent cities’ interests vis-à-vis national governments or in international processes (vertical). For example, the Global Taskforce of Local and Regional Governments (GTF) is a meta-network of associations of local and regional governments that

helps them arrive at joint positions to voice in international negotiation processes (GTF 2018). ICLEI—which is a member of the GTF—is the focal point for the Local Authorities Major Group (LAMG) in the UNFCCC process, and in this context links the coordination efforts of the GTF to the UNFCCC process (ibid.). City networks can also help improve access to funding: local governments that participate in city networks may jointly bid for funding, or the city network applies for funding on their behalf (Kern and Bulkeley 2009: 321). They also enable local governments in finding peers for sharing information and good practices, and may provide trainings and offer technical support to local governments.

The proliferation of city networks, twinning initiatives and partnerships aimed at supporting local climate action suggests that local governments consider these useful instruments. For example, Acuto and Rayner (2016: 1153) have identified more than 170 city networks, of which 29 percent have a principal focus on the environment. However, the proliferation—particularly of city networks—may also lead to unnecessary competition amongst the networks, and may be confusing for local governments trying to identify which ones to engage with.

Typically, city networks, city twinning and partnerships are examples of horizontal governance between local governments with a strong bottom-up element, as they are usually implemented voluntarily and in the absence of strong top-down support. However, there are also examples of city networks and partnerships that do not fit this characterisation. For example, the European Union was involved in the initiation of the Covenant of Mayors, which has moreover received financial support from the European Commission. Individual countries may also support city networks and related urban initiatives, e.g. Germany. The German Federal Ministry for Economic Cooperation and Development (BMZ) co-funds the C40 Cities Finance Facility, which helps C40 member cities in developing and emerging economies in developing and implementing climate mitigation and adaptation projects (C40 2016), while the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) funds climate projects of C40 and ICLEI through its International Climate Initiative (IKI).

For national governments, nationally operating city networks and local government associations can be interesting as partners to involve in consultations on local climate policy. Depending on the representativeness of their membership, such networks or associations may be well positioned to aggregate the view of local governments and communicate them to higher levels of government. Support from national governments can also help scale up the activities of successful city networks, partnerships and twinning initiatives. Moreover, nationally operating city networks—such as the Deutscher Städtetag in Germany or the South African Local Government Association (SALGA)—can help “localise” global agendas and agreements such as the 2030 Agenda for Sustainable Development and the Paris Agreement. For example, already shortly after the 2030 Agenda was signed the *Deutscher Städtetag* prepared a model resolution for its members that allowed them to signal their commitment to implementing the 2030 Agenda at the local level. The *Deutscher Städtetag* has also partnered with other networks as well as academic institutions and foundations to develop a set of indicators to help German municipalities monitor the local implementation of the 2030 Agenda.

Despite many potential advantages, studies indicate that caution is required regarding the potential of city networks to contribute to the achievement of global climate change goals. Firstly, there is a regional bias, with most cities that participate in city networks being concentrated in the Global North (Bansard et al. 2017). Thus, the benefits of city networks in catalysing climate action may be reaching mostly cities in wealthier and more developed countries. Secondly, city networks tend to focus on “softer” activities such as knowledge exchanges and capacity building, rather than e.g. shared mitigation targets: few city networks working on climate change define specific, shared emission reduction targets (ibid.). This suggests that, “contrary to the prevalent narrative, the aggregate system of transnational municipal climate governance cannot be considered more ambitious than the multilateral level when it comes to climate change mitigation” (ibid.: 242). Thirdly, Acuto and Rayner (2016: 1165) also caution that the development of city networks often takes place without adequate accountability,

raising questions regarding the potential for undesirable structures to be locked in.

Table 3.7: Sub-types and examples of networks, city twinning and partnerships

Partnerships	At COP22, a partnership was announced between California and China's Alliance of Peeking Pioneer Cities (APPC) (World Bank 2016). Through the partnership, California—with assistance from the World Bank—will support the Chinese cities in developing low-carbon development strategies.
	Germany has several bilateral urbanisation partnerships (Urbanisierungspartnerschaften) that focus on topics that are of mutual interest for the partners. For example, the Sino-German Urbanisation Partnership “aspires to positively influence urban and environmental policy-making and implementation” in both Germany and China “in light of rising urbanisation rates, climate change-induced natural disasters, and increasing levels of environmental degradation” (Sino-German Urbanisation Partnership 2018).
City networks	Examples of transnational city networks with a strong climate focus include C40 , ICLEI , Global Covenant of Mayors for Climate and Energy , Climate Alliance , and Energy-Cities .
	There are also many national city networks with a strong climate focus, e.g. the Swedish Climate Municipality Network (Klimatkommunera), the Argentinean Network of Municipalities on Climate Change (Red Argentina de Municipios frente al Cambio Climático, RAMCC), and the Forum of Brazilian Capitals (Fórum das Capitais Brasileiras, CB27).
	In many countries, general-purpose municipal associations also contribute to peer learning and networking on climate change. Examples include the Association of German Cities (Deutscher Städtetag), the Association of German Districts (Deutscher Landkreistag), and the German Association of Towns and Municipalities (Deutscher Städte- und Gemeindebund), as well as the South African Local Government Association (SALGA).
City twinning	The Covenant of Mayors for Climate and Energy facilitates twinning exchanges where local governments can opt for either peer-to-peer exchanges or mentoring exchanges.
	The German Federal Ministry on Economic Cooperation and Development (BMZ) supports Municipal Climate Partnerships among German municipalities and cities from the Global South, wherein the partner cities develop joint climate action programmes (Engagement Global 2018).

Example: We Are Still In (United States)

On June 1, 2017, President Trump announced that the United States would be withdrawing from the Paris Agreement. In response to this development, non-federal actors launched several initiatives to communicate their enduring commitment to the Paris Agreement despite the federal retreat. One of these initiatives—**We Are Still In**—is the focus of this case study. It is a network of US businesses, cities, states, tribes, research institutions, cultural and religious entities that has by now been joined by more than 2700 entities, including 250 cities and counties (We Are Still In 2017).

We Are Still In is coordinated by a range of different institutions, including non-governmental organisations, city networks, philanthropic institutions, and business networks. The initiative was able to swiftly react to the announcement of the intended withdrawal from the Paris Agreement as these institutions had been preparing for this possibility since Trump took office (Expert interview). Moreover, the institutions coordinating We Are Still In were able to build on well-established ties to cities, states, businesses, and other non-federal actors, allowing them to gather a large number of signatories to back the initiative within a few days (ibid.).

While We Are Still In initially emerged as an initiative that enabled a wide range of non-federal actors to signal their on-going commitment to climate action, its focus will expand over the coming months as the initiative will also support signatories in following up on their climate commitments (Expert interview). This will involve, for example, efforts to foster collaboration amongst We Are Still In signatories to encourage more ambitious climate action (ibid.). It will also involve connecting signatories to useful resources (ibid.). An example of such a resource is the guidance provided by the We Mean Business coalition to support large businesses in identifying possible areas for climate action.

The large number of institutions involved in steering We Are Still In as well as the large number of signatories has been both an opportunity and a challenge (Expert interview). Thus, the scale and diversity of actors involved in the initiative can make their commitment to a shared goal—supporting the implementation of the Paris Agreement—much more powerful. However, the number of participating entities also makes it challenging to coordinate on the details, such as advocacy strategies, scheduling meetings, etc. (ibid.).

A further initiative that emerged in response to President Trump's announcement is America's Pledge, which is spearheaded by California's Governor Jerry Brown, and Michael Bloomberg, the UN Secretary-General's special Envoy for Climate Action (America's Pledge 2017a). The focus of America's Pledge is on quantifying and aggregating the impact of climate action by US non-federal actors, including the members of We Are Still In and other initiatives (ibid.). In this sense, America's Pledge is complimentary to the efforts of We Are Still In (Expert interview). It signifies a clear understanding of the power of data, with a recent report suggesting that the US states and cities supporting the Paris Agreement represent 49 percent of the US population, 54 percent of total US gross domestic product (GDP), and 35 percent of US GHG emissions (America's Pledge 2017b: 19). This communicates that their efforts should be taken seriously and bolsters the perception that they are climate leaders (Watts 2017).

Both of these initiatives have a very strong bottom-up character. For example, Bloomberg has argued that the combined efforts of US non-federal actors should be considered as a subnational submission to the UNFCCC alongside other countries' NDCs. Such statements position non-federal actors, including states and cities, as independent actors that will engage in ambitious climate action despite a lack of input or guidance from the federal level.

This strong bottom-up character of current climate action in the United States was also visible at COP 23 in Paris. US non-federal actors were highly vocal and visible, with numerous side events featuring cities, states, tribes, businesses, and research institutions. Moreover, while there was no official US pavilion at COP 23, the pavilion of US non-federal actors was hard to miss.

Efforts of cities and other actors to form networks, engage in climate advocacy and share tools to support climate action are not new. Yet initiatives such as We Are Still In stand out not only for the breadth and diversity of their membership, but also because they present themselves as an alternative US voice on climate action at a time when the federal government has renounced its climate commitments. While the extent to which these efforts manage to catalyse climate action in the US remains to be seen, their normative impact and efforts to increase the international visibility of US non-federal action has already been substantial.

3.4 Institutional capacities

3.4.1 Human resources and capacities

Local governments require human resources with adequate technical, institutional and strategic capacities to develop and implement locally appropriate adaptation and mitigation strategies and concepts. Skilled personnel is necessary to effectively lead policy processes, steer their implementation and monitoring and serve as focal points for horizontal coordination with other local governments as well as vertical coordination with key national agencies.

Adequate capacities allow local governments to perform their tasks efficiently and enable them to make more long-term, strategic decisions to meet national objectives (Charbit and Michalun 2009: 28). Examples of instruments that can help improve the human resources and capacities of local governments include the provision of funding for the recruitment of expert personnel, trainings to improve the skills and knowledge of local government employees, and mentoring programmes involving experts or other local governments (Charbit and Michalun 2009; Khan et al. 2016; Archer et al. 2017).

Expert personnel such as “climate managers” or “resilience officers” can initiate and support the development of local adaptation and mitigation strategies and concepts most suitable to the local context and can take forward their implementation and monitoring (Khan et al. 2016). They can serve as key contact and coordinate climate action between different municipal departments and other key actors and entities (Difu 2011). Skilled personnel also has an important role in awareness-raising and creating and capturing knowledge on climate change issues in departments and institutions which are not directly concerned with climate issues in their daily work (Archer et al. 2017). An example of a national programme that recognises the value of such skilled personnel is Germany’s climate manager programme, which provides local governments with funding to hire an expert to coordinate their climate activities.

The capacity needs of the subnational level now have an institutional home under the UNFCCC. Though the Paris Agreement broadly states the need to build adequate capacities in developing countries without a specific reference to local governments,¹⁰ in 2016, the Paris Committee on Capacity Building (PCCB) was established “to address gaps and needs, and coherence and coordination of capacity building activities under the Convention” and established a

work plan that makes extensive references to the subnational level, and which will be followed up in annual sessions (Decision 1/CP.21, para. 71–83; Khan et al. 2016). Moreover, international thematic and financial entities involved in capacity building—such as the Climate Technology Centre and Network (CTCN) and the Green Climate Fund’s readiness programme for accessing funds—are available as part of the UNFCCC system. A key role for national actors is to lead in the identification of region-specific needs and priorities and match them with existing opportunities.

National governments can play an important role in ensuring that labour markets have an adequate supply of skilled and educated personnel through a strong education system built on universities, research and continued training (Khan et al 2016: 15). In addition, raising awareness at various levels and increasing the involvement of national government institutions in capacity building initiatives is crucial. A key role of the national level is to make financial and technical resources available for the local level to take advantage of capacity-developing offerings. Additionally, national governments may also directly provide capacity building trainings for municipal staff.

In developing instruments to strengthen capacities and human resources, key challenges that must be addressed relate to their sustainability and the retention of skilled personnel. Thus, on the one hand, it has proven difficult to ensure the sustainability of capacity building measures, as many of them tend to be “ad-hoc, short-lived, mainly project-based interventions” (Khan et al. 2016: 2). On the other hand, the difficulty in retaining individual and institutional capacity on a long-term basis affects both national and local governments. Developing countries also report a lack of training in vulnerability and adaptation assessments and methodologies (Khan et al. 2016).

¹⁰ “Capacity-building under this Agreement should enhance the capacity and ability of developing country Parties, in particular countries with the least capacity” (Paris Agreement, art. 11)

Table 3.8: Sub-types and examples of instruments strengthening human resources and capacities

Financing for skilled personnel	In Belgium, the Brussels–Capital Region (regional level) provides free advice to a range of actors, including local governments and local planning authorities, through Eco-District Facilitators (IEA 2018c).
	One of the key components of Germany's Municipal Directive for Climate Protection (Kommunalrichtlinie, KRL), which supports planning, advocacy and mainstreaming of climate change at the municipal level, is that it provides funding for local governments to hire an expert referred to as a climate manager (Klimaschutzmanager) that is responsible for coordinating all climate activities in municipalities (BMU 2017b) (see more information below).
	The C40 network holds a competitive process in which its member cities can apply to host City Advisers—staff dedicated to climate change mitigation and adaptation responsibilities, including the development and implementation of plans, policies and projects (C40 2018b).
Capacity development for the local level	In Germany, the Service Centre for Municipal Climate Action (Service- und Kompetenzzentrum: Kommunaler Klimaschutz, SK:KK) provides coaching opportunities as well as online and in-person events to support the development of capacities in German municipalities, for example practice workshops (Praxiswerkstätten) and thematic seminars (Themenseminare) (BMU 2018d).
	In Brazil, the training institution Oficina Municipal offers trainings for municipal employees on a range of issues, including e.g. responsible administration, international cooperation, and environmental policy (Oficina Municipal 2018).
	Affairs, the Department of Cooperative Governance and Traditional Affairs, and the South African Local Government Association offers trainings for municipalities and provinces with the Let's Respond to Climate Change Toolkit for mainstreaming of climate change into municipal Integrated Development Planning since 2012 (urbanEarth n.d.).

Example: Klimaschutzmanager (Germany)

Germany's National Climate Initiative (NKI) is the key national support instrument for local climate action. Its target groups are districts, towns and communities; private households and consumers; businesses; and educational institutions. More than 12,500 projects in about 3,000 municipalities have been supported through the NKI since 2008 (BMU 2017a).

Within the NKI, the German Municipal Directive for Climate Protection (KRL) of 2008 is an instrument that specifically supports planning, advocacy and mainstreaming of climate change in municipalities, as well as the implementation of concrete measures, with an emphasis on climate change mitigation, with the goal to reduce municipal GHG emissions by 40 percent relative to 1990 by 2020 (Projekträger Jülich 2018). The KRL offers a comprehensive support package for municipalities, including for example

support to develop their climate action plans, funding to implement them, as well as subsidies to fund the position of a **Climate Manager** working within the municipal administration (BMU 2017b). It is thus an example of an instrument that addresses a crucial governance capacity: availability of skilled employees to support different aspects of implementing local climate action. By financing a position whose sole focus is on this topic, it can help institutionalise climate change at the municipal level.

The main responsibility of a climate manager is the support for the implementation of the municipal climate action plan (*Klimaschutzkonzept*) of the respective municipality (Expert interview). In order to fulfil this responsibility, climate managers' tasks cover a range of issues related to coordinating municipal climate activities; communicating, public relations, building and sustaining networks with internal departments and actors within the municipal administration; supporting the integration of climate change in all

sectors and institutions at the municipal level (BMU 2017b; Expert interview); connecting with all relevant stakeholders (citizens, businesses, etc.) to raise their awareness of climate change issues in the municipality and ensuring that they are informed and involved; and preparing briefings and information for decisions to be made at the political level in the respective municipality (Expert interview).

Financial support is available for the position of a climate manager for an initial period of three years, depending on the scope of the local climate action plan (BMU 2017b), and upon a proposal submission for an extension of two additional years (Expert interview; BMU 2017b). The position is usually subsidised with federal funds for up to 65 percent (up to 90 percent for municipalities with particularly limited financial resources) (ibid.). A range of different constellations are possible for applying for funding for a climate manager. For example, municipalities can jointly apply for a climate manager, and districts (intermediate administrative levels between the municipalities and the German states) can also apply for climate managers together with the municipalities within that district (ibid.: 8; Expert interview). Likewise, there are districts that have integrated local climate action plans encompassing the jurisdiction of more than one municipality (Expert interview). A few illustrative examples are Darmstadt-Dieburg in the federal state of Hessen (Landkreis Darmstadt-Dieburg 2018), Mayen-Koblenz in the north of Rhineland-Palatinate (Landkreis Mayen-Koblenz 2018), Fürth in Bavaria (Landkreis Fürth 2018) and Ludwigsburg in Baden-Württemberg (Landkreis Ludwigsburg 2018).

Climate managers have regular support in various forms, which can vary across municipalities and across federal states (*Bundesländer*). On the one hand, they can take advantage of training programmes and networking events offered by the Service and Competence Centre for Local Climate Action (*Service- und Kompetenzzentrum: Kommunalen Klimaschutz, SK:KK*), as well as mentoring from more experienced climate managers (BMU 2017b). On the other hand, federal states like Mecklenburg–Western Pomerania have a network of climate managers who meet once a year to exchange learnings and strategic advice with

the support of the state's Energy Ministry (Expert interview).

In terms of multi-level climate governance, the KRL is an instrument that provides support for municipalities to engage in climate action, but leaves it up to them to decide on their own priorities. As part of the KRL, the financial support for climate managers is embedded in a range of other policies, programmes and initiatives that together make up a holistic support package for municipalities (see Figure 3.4). Financial support to develop and implement climate projects, the dedicated SK:KK Service and Competence Centre that provides advice on issues such as funding opportunities, and guidelines for municipal climate action (*Praxisleitfaden Klimaschutz in Kommunen*) are just some examples of the support opportunities available for municipalities in the country (BMU 2017b).

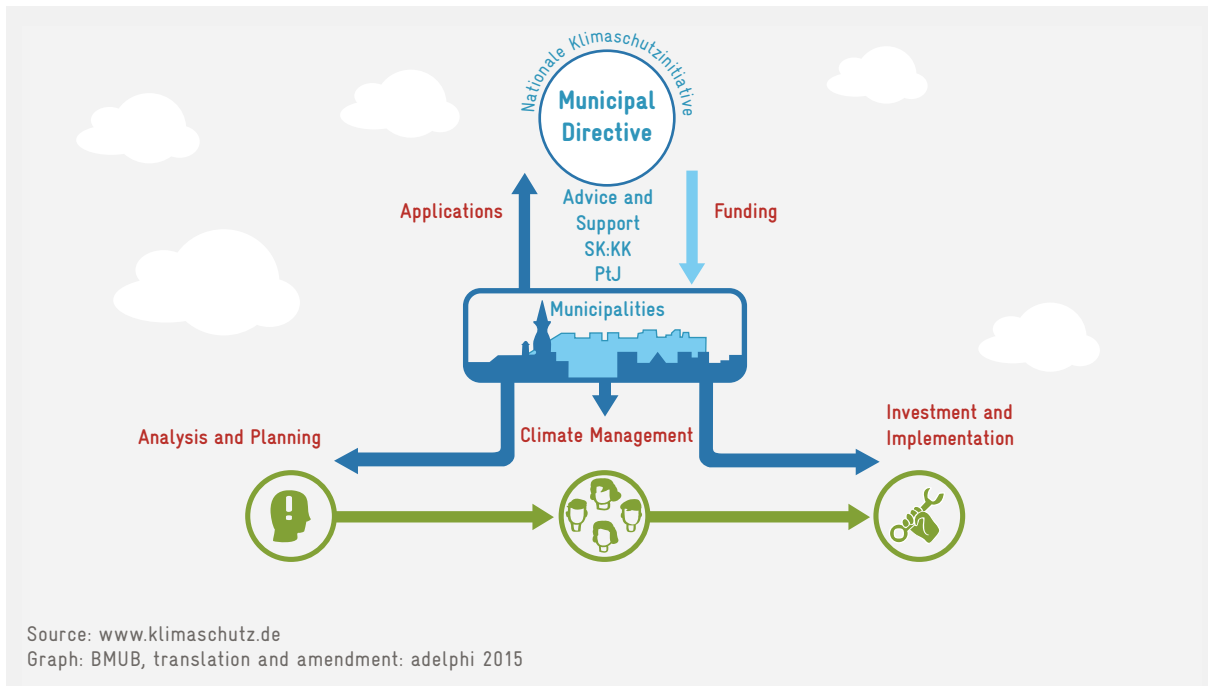
The position of a climate manager in the municipality's organigram varies across municipalities, depending on the size of the administration and the thematic divisions that it encompasses. The team in which a climate manager is located is an important determinant for the success of a climate manager and for the agility of her or his actions. If located far from the executive leadership in the command chain, official channels and decisions that allow climate managers to take actions can be lengthy (Expert interview).

The success of climate managers can also be linked to the political commitment to climate change mitigation in the respective municipality, and on the support and collaboration of the municipal institutions with a climate manager. Because climate action is a voluntary task at the municipal level, the climate manager position can sometimes be cut back if a municipality is facing difficulties. Moreover, since this position is often concerned with networking, communicating and raising awareness, the ways of working of climate managers can be new in municipalities where members of staff come from technical backgrounds. The strategy that focuses on a skilled climate manager also highly relies on the ability of this person to be able to tap into networks and on the receptiveness of the relevant municipal sectors, such as waste management and water service delivery (Expert interview).

The case of climate managers illustrates well the need to select instruments depending on the existing policy and instrument mix in a country. Climate managers rely on the national support provided (funds to finance the human resources, an overarching framework

defined by the Municipal Directive for Climate Protection, as well as the support for coordination and cooperation with other local governments) and the existence of a municipal climate action plan in the respective local government.

Figure 3.4: The German Municipal Directive for Climate Protection





4 Multi-level climate governance frameworks

This chapter analyses the multi-level climate governance frameworks of India, Brazil, Colombia and South Africa in an exemplary manner. The purpose of this review is to highlight the diversity of framework conditions existing in different countries and illustrate the role of different multi-level climate governance instruments in these diverse framework settings. While all four countries have a tendency towards either top-down, bottom-up or hybrid multi-level climate governance, the analysis shows that, firstly, these governance contexts are not set in stone and are subject to change over time. Secondly, as mentioned above, “top-down”, “bottom-up” and “hybrid” are better understood as continuous rather than discrete categories.

The four countries were purposefully selected from the global South following the criteria of diversity—both regarding global geography (two countries in

Latin America, one in Africa and one in Asia) and political system (two federal or quasi-federal states—Brazil and India—with differing levels of top-down and bottom-up multi-level climate governance approaches and two unitary states—Colombia and South Africa—also with differing levels of hybrid approaches). Two countries—Brazil and India—are among the ten largest global emitters (WRI 2017). India was also one of the ten most affected countries by climate risk in 2015 according to Germanwatch (Kreft et al. 2017). Based on fatalities and losses in 2015, Colombia and India are among the 50 most vulnerable countries in the world (ibid.).

The analysis of the four multi-level climate governance frameworks focuses on the following issues:

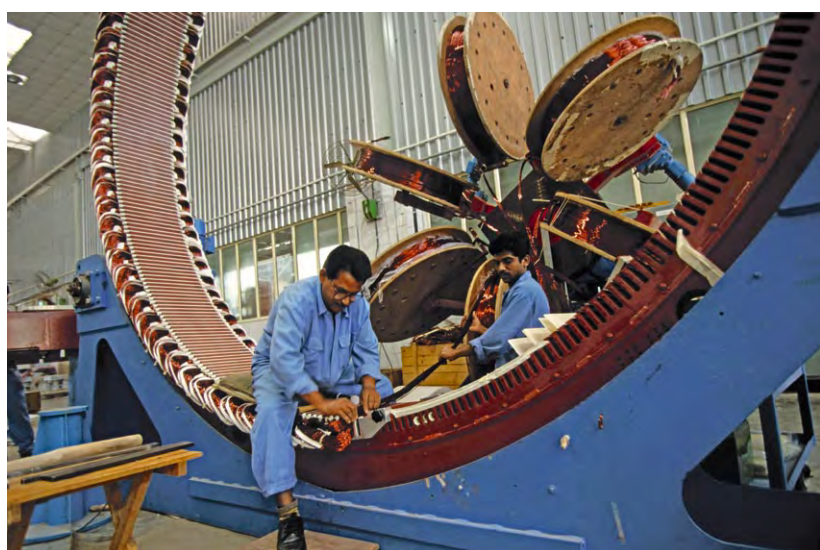
- **Background:** what are the key issues related to cities and climate change in the country?

- **Multi-level climate governance framework:** what are the main characteristics of the multi-level climate governance framework? What relations, mandates, roles and responsibilities of different levels of government are specified in the country's constitution, and how do they affect local climate action?
- **Key instruments:** what are examples of key multi-level climate governance instruments being employed in the country? What are their goals? How do they fit into the multi-level climate governance landscape? What are the key institutions and actors involved?
- **Challenges and opportunities:** to what extent do the framework and instruments support local climate action? What key issues and lessons learned emerge?

4.1 Multi-level climate governance in India

4.1.1 Background: cities and climate change in India

A growing urban population and economic growth are two key factors that are increasing the importance of adaptation and mitigation considerations for Indian cities due to associated challenges. The share of the Indian population living in urban areas is projected to increase to 814 million by 2050 (from 410 million in 2014), surpassing the size of the rural population (estimated at 857 million in 2014 but projected to decline to 805 million by 2050) (DESA 2014: 22). This increase in the urban population has led “to a call by the Indian Government to build 100 new cities over the period” (UN-Habitat 2016c: 174). Much of the infrastructure to accommodate the growing urban population of India also still needs to be built. Will these new cities and infrastructures contribute to a sustainable future, or be locked in to high emission development paths? Concerted efforts at all levels and appropriate capacity development will be necessary to meet these challenges. For example, (urban) planning plays an important role with regard to the development of climate-friendly and resilient cities. However, planning capacity in India is very limited: “In the



UK, there are 38 planners per 100,000 population, while in Nigeria and India the figure is 1.44 and 0.23 respectively” (ibid.: 121).

In addition to population growth, economic growth is an important contextual factor for climate action in India. While current per capita energy consumption in India is low, population growth and economic growth contribute to a rising overall and per capita energy demand (Gouldson et al. 2016: 13). Considering the carbon intensity of Indian energy (ibid.), ensuring that renewable energy becomes a priority energy source is important. With respect to adaptation, many cities in India are vulnerable to sea level rise due to their proximity to the coast, while others already experience the impacts of extreme weather events such as heat waves and flooding (Beermann et al. 2016: 58). Such urban adaptation concerns are likely to increase as the share of the population living in cities increases. They will moreover most strongly affect those parts of the population that are already now most vulnerable to climate impacts, such as the inhabitants of informal settlements.

Many Indian cities are already taking action on climate change. For example, New Delhi launched India's first city-level climate change agenda in 2009, while other cities such as Hyderabad and Kolkata have implemented sectoral strategies with climate benefits in areas such as transportation and waste management (Beerman et al. 2016: 58–9). Rajkot has conducted

emissions inventories using the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (see section 3.1.1), has developed a Low Emission Development Strategy (LEDS) Action Plan, and developed a number of specific mitigation and adaptation actions to achieve its climate goals (cCR 2017b).¹¹

Nonetheless other, more urgent concerns—such as accommodating rapid population growth and addressing poverty—often detract attention from climate action (Beermann et al. 2016; Expert interview). This leads to a risk that the significant scope for GHG emissions relative to business as usual that exists in many Indian cities is not used, and that crucial opportunities to ensure that the substantial investments that will be needed in housing, energy, transport and waste infrastructure are climate friendly are missed (Gouldson et al. 2016: 11–2). Multi-level climate governance will be important in helping Indian cities address these challenges and capitalise on opportunities for GHG mitigation, as the “multiple policy levers that need to be pulled to access these opportunities exist at different scales and in different sectors” (Gouldson et al. 2016: 17).

4.1.2 India’s multi-level climate governance framework

India has in the past been described as a “heavily centralised quasi-federal system” or “minimal federalism” (Jørgensen et al. 2015: 269), indicating that even though India is a federal state (composed of 29 states and seven union territories), the national government typically plays a central role in setting the agenda, formulating policies (with limited input from the subnational level), and coordinating implementation at the state level. However, while studies agree that the impetus for the emerging climate and energy policy fields initially came from the central level in a top-down fashion, they also indicate that in recent years state and local governments have begun formulating and implementing their own climate policies more proactively (e.g. Atteridge et al. 2012; Beermann et al. 2016; Jørgensen et al. 2015; Expert interview). States are also responding to national plans, guidelines and policies in a manner that reflects their own economic and political circumstances, yet their

autonomy is constrained by limited financial resources (Jørgensen et al. 2015).

The Constitution of India specifies which policy areas are the responsibilities of the national and state governments, respectively. With respect to climate change, relevant policy areas are at times the responsibility of the national government, state governments, or shared by both. Energy policy is an example where responsibility is shared (Jørgensen et al. 2015). The national government is, for example, responsible for issues such as nuclear power, minerals and oil, while state governments are responsible for legislation on taxes on the consumption or sale of electricity (ibid.). For another key policy area for local climate action—urban development—the responsibility lies with state governments, which then can delegate implementation responsibilities to local governments (Sharma and Tomar 2010: 458). The Ministry of Housing and Urban Affairs offers states guidelines and financial support (ibid.).

Decentralisation reforms have not only increased the powers of state governments, but also municipal governments (Beermann et al. 2016: 57). However, studies find that despite formal legislative powers related to climate or energy policy at the state level, “the scope for bottom-up action should not be overestimated” due to financial bottlenecks and a continued dependency on financial transfers from the national government (Jørgensen et al. 2015: 269; Sharma and Tomar 2010: 459). Moreover, cities’ scope for autonomous action generally is even more limited since—even though the powers of local government varies by state—significant decentralisation from the state to local government level has not occurred, leading to weak institutional and financial capacities of municipal governments (Beermann et al. 2016: 57).

4.1.3 Key instruments in India

National level

Multi-level governance plays an important role in key legislation related to climate change in India. For example, the **National Action Plan on Climate Change** (NAPCC, launched in 2008) provides the main framework for mitigation and adaptation at the national level, with policies and targets being regularly

¹¹ This was supported by the Urban LEDS project. In addition to Rajkot, Thane is another model city for the Urban LEDS project in India. The project also engages in six further Indian cities (satellite cities). The model cities and satellite cities are supported in mainstreaming climate change into their urban planning and development.

updated through Five Year Plans (Gouldson et al. 2016). It supports the mainstreaming of climate change concerns into urban planning processes at all levels (Sharma and Tomar 2010: 460). India's key international commitment—which is enshrined in its NDC¹²—is to reduce the emissions intensity of GDP by 33–35 percent over 2005 levels by 2030 (Government of India 2016: 29).

A consultative body—the **Advisory Council on Climate Change**—was formed to develop the NAPCC. The Advisory Council is chaired by the Prime Minister and includes representation from a range of stakeholders, including various national ministries, industry, academia and civil society (Jha 2014; LSE 2017a). Subnational governments are however not represented on the Council. While the Advisory Council did not meet for several years after the development of the NAPCC, it has more recently reconvened and may yet prove to have a stronger role in coordinating NAPCC implementation across the ministries (Jha 2014: 5).

However, the lack of a comment period for the NAPCC or broader consultation process has been criticised and national consultative processes on climate change have been challenged as less inclusive than in other emerging economies such as South Africa and Brazil (Dubash and Joseph 2015: 47, 52).

At the national level, a range of ministries are involved in the implementation of the NAPCC and its missions. However, Dubash and Joseph (2015) diagnose a lack of mechanisms to coordinate between the ministries, leading to siloed implementation. During the early stages, the position of the **Prime Minister's Special Envoy on Climate Change** was created and played a key role in coordinating mission development between ministries. However, after the Office of the Special Envoy was dissolved, coordination has been rather ad hoc (Dubash and Joseph 2015: 52). An **Executive Committee on Climate Change (ECCC)** “composed of secretaries, the highest ranking bureaucrats in each ministry” was established in 2013 to remedy this situation (ibid.: 49). Another issue that hampers horizontal coordination across national-level

ministries is a lack of capacity and expert personnel (ibid.).

The NAPCC also outlines eight national missions, including a **National Mission on Sustainable Habitat** which, inter alia, “seeks to promote energy efficiency as an essential component of urban planning” and “calls for extending the Energy Conservation Building Code, and emphasises urban waste management and recycling, including power production from waste” (LSE 2017a). In addition to the National Mission on Sustainable Habitat, a range of other programmes and missions—such as the **Solar Cities Programme**, the **Smart Cities Mission**, the **Atal Mission for Rejuvenation and Urban Transformation (AMRUT)**, the **National Heritage City Development and Augmentation Yojana (HRIDAY)** and the now ended **Jawaharlal Nehru Urban Renewal Mission (JNNURM)**—provide funding opportunities that cities can use to implement local climate action. While not all of these programmes explicitly address climate mitigation and/or adaptation concerns, motivated local bodies may nonetheless try to implement them in a manner that also provides climate benefits, as is outlined in more detail below.

State level

State governments are obliged to prepare **State Action Plans for Climate Change (SAPCCs)**¹³ to adapt the NAPCC and its national missions for the state level and ensure implementation. They must be endorsed at the national level.

While this process of hierarchical coordination and approval of the SAPCCs is indicative of a top-down process (rather than climate policies emerging at the subnational level in response to concerns about climate change and impacts), the priorities of each state government are a strong influence on the SAPCCs (Atteridge et al. 2012: 72; Gouldson et al. 2016: 13; Jørgensen et al. 2015: 273). Thus, there is significant variation in the way states engage with climate policy. For example, Gujarat was the first state to set up its own climate change department, while Kerala

12 Initially, NDCs were referred to as intended nationally determined contributions (INDCs), because countries communicated them prior to the finalisation of the Paris Agreement (WRI 2018). The INDCs become NDCs “as countries formally join the Paris Agreement” (ibid.). India ratified the Paris Agreement on 2 October 2016, which then came into force in India on 4 November 2016. Thus, India's INDC is now an NDC.

13 Many states received support from donors, international agencies or consultants (e.g. UNDP, GIZ) in preparing their SAPCCs, indicating international linkages in this multi-level climate governance framework (Jha 2014 : 5, Dubash and Joseph 2015 : 52). However, concerns arise that such a process of preparing the SAPCCs may limit ownership of the plans within state bureaucracies (Tankha and Rauken 2013: 22).

announced a green fund to be used for climate change objectives (Atteridge et al. 2012: 72). However, other states were much slower in recognising “climate change as a policy concern” (ibid.: 72–4). Institutional responsibility and arrangements for climate policy differs across the states, which may also influence their priorities and approaches to climate change (Atteridge et al. 2012: 74; Gouldson et al. 2016: 13). Other factors affecting the diversity of SAPCCs are their development priorities, “climate vulnerability and the economic opportunities associated with mitigation” (Gouldson et al. 2016: 13).

At the state level, lack of political continuity has also been a concern, as frequent changes in postings for bureaucrats mean that the incentives for longer-term planning are limited (Tankha and Rauken 2013: 26; Expert interview).

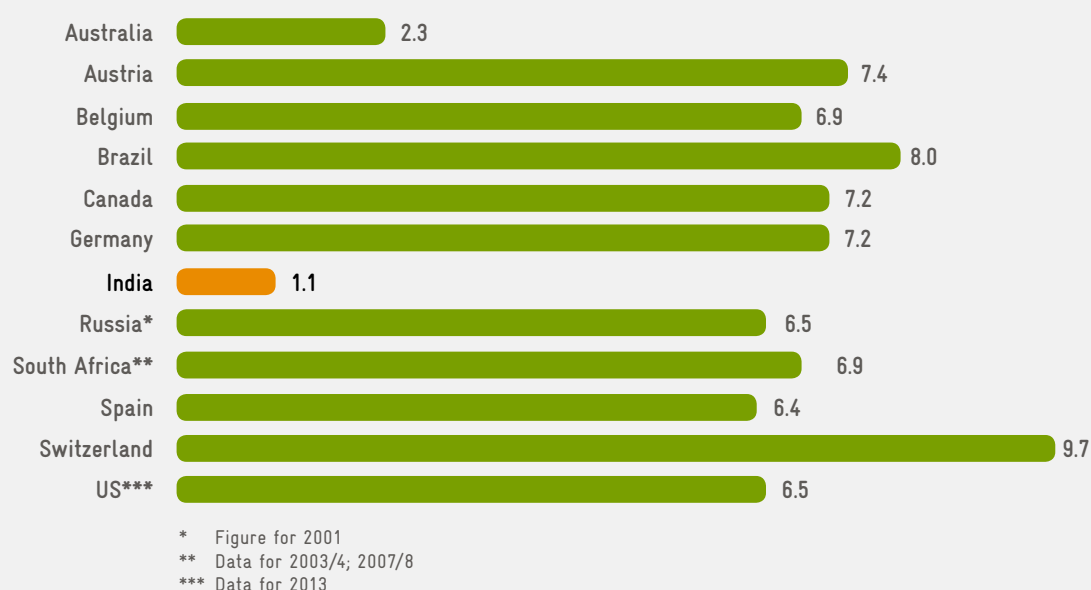
Local level

The implications of the SAPCCs for local governments depend on the extent to which state governments have decentralised governance to local governments. Often, the level of autonomy that local governments have differs quite significantly across policy areas that are relevant for climate governance, leading to diffi-

culties in coordinating between different departments at the local level. For example, in Kolkata, municipal bodies have significant leeway in pursuing low carbon strategies in policy areas that have been devolved to the local level, such as waste management (Gouldson et al. 2016: 17). However, in other policy areas, Kolkata has been less successful in adopting low-carbon development strategies due to a lack of mandate (e.g. for energy governance), lack of coordination across different departments or conflicting priorities (e.g. to expand the road network, which limits support for public and non-motorised transport) (ibid.: 17). Thus, climate change policies are often implemented in a sectoral rather than integrated fashion. While this problem affects many Indian cities, some have also demonstrated that a more integrated approach is possible. For example, Mumbai and Delhi have both mainstreamed mitigation and adaptation into spatial planning (Gouldson et al. 2016: 13).

A further challenge for municipal climate action is access to finance. Thus, as is indicated in Figure 4.1, municipal expenditures in India amount to just 1.1 percent of GDP—far lower than, for example, in Brazil, Russia and South Africa (UN-Habitat

Figure 4.1: Municipal expenditures in India and other countries (% GDP)



Source: UN-Habitat (2016: 11)

2016c: 11). This indicates that the scope for autonomous local climate action is limited. Both state and local governments are moreover highly dependent on allocations from higher levels of government for climate-related projects and international climate finance (Jha 2014).

Despite the general top-down nature of multi-level climate governance in cities, there is also evidence of cities going beyond national or state requirements and incorporating climate change into urban development processes in an unprompted manner. For example, the city of Rajkot has found ways to include climate objectives while implementing various state or national schemes at the local level, even though this was not necessarily required (Khosla and Bhardwaj 2017). In implementing national and state schemes for affordable housing that include no specific climate objectives, the housing team of the Rajkot Municipal Corporation has, “with support from local architects and international experts, included passive cooling, lighting and ventilation, and rainwater harvesting features in the building design guidelines” (ibid.: 3). Rajkot has also promoted energy efficiency and renewable energy measures, such as solar photovoltaic systems on office building rooftops and encouraging industrial energy efficiency (ICLEI 2017a).

The experience of Rajkot shows that there is substantial flexibility for independent climate action in Indian cities under the right conditions, such as local creativity and leadership, support from other actors, and conducive policy frameworks at the state and national level (Khosla and Bhardwaj 2017). Sufficient capacities, for example with respect to the training of local government staff, are also important. In the absence of such capacities, local governments will be dependent on donor support, and/or must hire external consultants (and have the resources allowing for this) who are less familiar with the local context (CPR 2017).

Other instruments that are being used by local governments in India include monitoring and reporting instruments. For example, Rajkot and at least seven other Indian cities have used the **Global Protocol for Community-Scale Greenhouse Gas Emission Inventories** (see also section 3.1.1) to conduct their emissions inventories (ICLEI 2017b). Indian cities have also been active in **city networks, partnerships**

and city twinning to support their climate governance efforts through exchanges on issues of mutual interest, encourage the development of relevant skills and capacities at the local level, and gain access to climate finance.

4.1.4 India's challenges and opportunities

Emergent institutional framework: In general, institutions for multi-level climate governance in India are still emergent and have gone through considerable evolution in the last ten years (Dubash and Joseph 2015; Jörgensen et al. 2015). Thus, despite an overall top-down approach to multi-level climate governance, there are indications of increasing autonomy at the local and state levels.

Conflicting policy objectives: A challenge that is shared with many other countries concerns the fact that conflicting policy objectives may dampen support for climate policy. In India, “climate change issues are typically subordinated to the prerogatives of economic development and poverty reduction”, although this is changing as the risks of climate change for India become clearer and the possibility of co-benefits from climate action becomes more evident (Beerman et al. 2016: 60–1).

Limited political support for implementation: There are indications that political support for the SAPCCs is relatively weak or lacking in several states. In Odisha, the development of the SAPCC received substantial political and bureaucratic support, as indicated by the explicit support of the Chief Minister in the preparation of the Plan and its implementation and monitoring by a committee chaired by the Chief Secretary (Jörgensen et al. 2015: 278). However, in other states, “it is individual leadership in the bureaucracy that seems to be driving forward the planning process”—such as nodal officers for climate change—with high-level political support being less evident (Jörgensen et al. 2015: 278).

Coordination challenges: A lack of coordination—at all levels—is a further challenge that needs to be tackled. For example, departments within local governments often work in a siloed manner. A lack of effective coordination mechanisms as well as a

lack of personnel and capacities hampers horizontal coordination among national-level ministries.

Consultants and international development agencies have played an important role in preparing many SAPCCs, developing local projects, and helping cities submit applications for national funds (Expert interview). While this allows state and local actors to draw on external expertise, it also indicates a lack of capacity. Where consultants and development agencies provide support, it is therefore important to ensure that state and local actors are deeply involved in the process to help build capacity for the future. This is moreover important to ensure long-term ownership of the plans and projects developed with the help of external support.



4.2 Multi-level climate governance in Brazil

4.2.1 Background: cities and climate change in Brazil

Brazil is a highly urbanised country: more than 85 percent of the population currently lives in urban areas (UN DESA 2014: 49). This is expected to further increase in the coming years. Brazil will likely experience a large decline in the rural population by 2050, while

the share of the population living in urban areas in 2050 is projected to increase to 91 percent (ibid.: 52).

Despite such a large urban population, urban mitigation and adaptation policies have been relatively low on the political agenda. On the one hand, with respect to climate change policy, the key concerns in Brazil tend to be deforestation, land use change, and maintaining a high share of renewable energy¹⁴ in the power supply (Kahn and Brandão 2015; Viola and Hochstetler 2015). On the other hand, in terms of urban development, climate change also competes with other concerns that are often perceived as more urgent, such as reducing urban inequalities and class divides (Kahn and Brandão 2015: 5). Development and economic growth are also priority concerns (Viola and Hochstetler 2015).

Compared to other sectors such as deforestation, GHG emissions from cities in Brazil are relatively low. However, while “cities account for less than 30 percent of national GHG emissions in Brazil, they are the fastest growing source” of GHG emissions (World Bank 2010b: 55). As the country’s population becomes increasingly urban, mitigation and adaptation concerns in cities are thus likely to increase in importance.

With respect to mitigation, the key potentials for Brazilian cities are in areas such as transportation, building energy efficiency and waste management (Kahn and Brandão 2015: 7). For example, there is a substantial potential for building energy efficiency as “electricity use in residential and commercial buildings accounts for about 50 percent of total power consumption in Brazil” (Kahn and Brandão 2015: 9). Urban sprawl is a further concern. In cities such as Rio de Janeiro and São Paulo, the lack of cooperation on urban growth at a metropolitan scale has led to uncontrolled development in peripheral communities with more limited capacities to manage urban development (World Bank 2010b: 53).

With respect to adaptation, Brazilian cities face various climate change-related hazards and vulnerabilities, such as an increasing frequency of heavy rains, heat waves, heavy winds, and storm surges, as well as rising sea levels and increases in diseases such as dengue (Kahn and Brandão 2015: 9; World Bank 2010b).

¹⁴ A low-carbon energy mix with a focus on large-scale hydropower means that emissions from the power sector are low compared to other countries (Viola and Hochstetler 2015: 237).

4.2.2 Brazil's multi-level climate governance framework

The Federative Republic of Brazil is a union of 26 states, the Federal District and 5570 municipalities. With the enactment of the current federal constitution in 1988, “Brazil began [devolving] considerable functional and fiscal powers to its municipalities” (UN-Habitat 2016c: 12). The powers devolved to municipalities cover several policy areas that are of relevance for local climate governance, such as intra-city transport and land use. However, in other policy areas, municipal power is either limited or shared with other levels of government. For example, jurisdiction to protect the environment and fight pollution in any form is shared between the federal government, states, Federal District and municipalities (Valente de Macedo et al. 2016: 38). Energy sources, generation and pricing are however the exclusive competence of the federal government, significantly reducing the scope for municipal governments to autonomously shape their energy supply (Setzer 2009: 8).

The constitution furthermore enshrines the right of municipalities to establish municipal stakeholder councils that may involve elected representatives as well as representatives from community groups to discuss local policies (UN-Habitat 2016c: 12). They may also establish other means of participatory local government. Municipalities could use such councils to establish local mitigation and adaptation goals and strategies in an inclusive, participatory manner.

4.2.3 Key instruments in Brazil

National level

Brazil adopted its first **National Climate Change Policy** (*Política Nacional sobre Mudança do Clima*) in 2009, which established a national GHG reduction target of between 36.1 and 38.9 percent of projected GHG emissions by 2020 (Anderton and Setzer 2017). It also contains sectoral emission reduction targets for deforestation, agriculture and livestock, energy, and steel besides the overall national emission reduction target (LSE 2017b).

Consultation platforms played an important role in shaping the National Climate Change Policy. A key body for horizontal coordination at the national level is the **Inter-Ministerial Committee on Climate Change** (*Comitê Interministerial sobre Mudança do Clima*, CIM). It was established in 2007 to elaborate a proposal for the National Climate Change Policy, and to support the implementation, monitoring and evaluation thereof. The Inter-Ministerial Committee is composed of ministerial representatives and other high-level government officials¹⁵. It also invites the **Brazilian Forum on Climate Change** (*Fórum Brasileiro de Mudança do Clima*, FBMC) as a guest. The Forum is chaired by the President and brings together representatives from national ministries and representatives from civil society, science, and business. The FBMC has encouraged the creation of regional, state and municipal climate change forums, with which it liaises and coordinates. Approximately 23 such sub-national forums have been established (FBMC 2017).

A key tool to support the implementation of the National Climate Change Policy is the **National Climate Change Fund** (*Fundo Nacional sobre Mudança do Clima*, FNMC) (LSE 2017b). The Fund offers both non-refundable and refundable (e.g. loans) sources of finance, with the former being managed by the Environment Ministry, and the latter by the Brazilian Development Bank (GIZ Brazil 2014). Sustainable cities and climate change, and urban mobility, are two of the ten sub-programmes of the FNMC (BNDES 2017).

More recently, Brazil's NDC outlines more ambitious commitments. Notably, Brazil is one of the few developing countries that have included absolute emissions reduction targets in their NDC (the country commits to reduce its GHG emissions by 35 percent below 2005 levels by 2025, and by 43 percent by 2030). While only one sectoral commitment in Brazil's NDC explicitly refers to the local level (mentioning improvements in transport efficiency and infrastructure for public transport in urban areas), the NDC also explicitly recognises “the importance of the engagement of local governments and of their efforts in combating climate change” (Government of Brazil 2015: 3). The extent to which such targets will be met with ambitious implementation efforts remains to be seen.

¹⁵ 16 ministries are represented in the CIM (including e.g. the Ministry of Cities, Ministry of Science and Technology, Ministry of Environment, Ministry of Transport, Ministry of Foreign Affairs, and Ministry of Finance). It is coordinated by the Chief of Staff of the President of the Republic.

For example, political, economic and societal challenges in Brazil mean that support for the climate agenda has been limited in recent years (Viola and Hochstetler 2015).

While Brazil thus has well-developed institutions and policies for climate change at the national level, it nonetheless still has strong characteristics of a bottom-up multi-level climate governance framework. Firstly, climate policies at the state and municipal level often emerged independently from, and in some cases earlier, than at the national level. For example, both the city and the state of São Paulo approved climate change policies shortly before the National Climate Change Policy was approved (Anderton and Setzer 2017: 7). Secondly, the climate actions of the state and city of São Paulo (and several other cities and states that later developed climate policies) were in many ways more ambitious than national policy, as the latter contains only a voluntary commitment to adopt mitigation actions for GHG emissions, while the former two established mandatory reduction targets (*ibid.*). Moreover, they also established absolute reduction targets: 20 percent for the state and 30 percent for the city relative to 2005, while the national target was a reduction of between 36.1 and 38.9 percent of projected GHG emissions by 2020 (*ibid.*). Considering that national emissions are projected to continue growing until 2020 under business as usual, the national target merely was a commitment to reduce the rate at which GHG emissions grow. Conversely, the targets of the state and the city are more ambitious because they commit to an absolute reduction relative to a fixed historical date. The more recently adopted national climate commitments in Brazil's NDC however indicate an increase in national level ambition, as they include absolute emissions reduction targets by 35 percent below 2005 levels by 2025, and by 43 percent by 2030. Nonetheless, ambitious climate action emerged earlier at the local and state level in Brazil, and in the absence of requirements from the national level.

State level

Several **Brazilian states** have established their own climate policies in the past decade independently of national guidance or requirements, such that by now a total of 14 out of 27 Brazilian states have a

climate policy in force (Barbi and Ferreira 2017: 245). Moreover, 16 states have established **State Forums on Climate Change** to stimulate consultation and coordination among representatives from state governments, civil society organisations, research institutions and the private sector (*ibid.*). Responsibility for climate change issues at the state level usually lies with the Secretary of Environment, which in some cases has established climate change departments or units (World Bank 2010b: 52).

An example of a Brazilian state with its own climate policy is São Paulo, which was the first subnational government in a developing country that adopted mandatory CO₂ emission targets at the state level (Anderton and Setzer 2017: 5). As an early mover on climate policy within Brazil, São Paulo sought to promote its policies and approaches for other subnational governments to emulate, both within the country and internationally (*ibid.*: 8).

The São Paulo climate policy promotes the “decentralisation of climate-policy making from the regional to the local level”, and attempts to improve coordination between local and state government in this multi-level climate governance context by sharing information and data (Anderton and Setzer 2017: 6). However, Anderton and Setzer (2017) find that coordination between the local and state level in São Paulo remains weak, a factor that contributes to the limited implementation of the climate policy. Indeed, there was already little exchange between policymakers from the city and state of São Paulo during the concurrent development of climate policies at both levels, leading to missed opportunities for synchronising and working together on issues such as transport (Expert interview). Other factors that have obstructed the implementation of climate policies in São Paulo state are the “limited capacity of regulatory agencies in terms of staff, technical expertise, financial resources and political will” (Anderton and Setzer 2017: 10).

Municipal level

Municipalities in Brazil are relatively well situated in terms of **own source revenues**. Indeed, Brazil is considered a “good example of decentralisation with improved financing in Latin America” (UN-Habitat 2016c: 11). The average Brazilian local government

raises about 35 percent of its total revenues internally, and receives about 65 percent from transfers from state and federal government (ibid.: 12). Municipal expenditures in Brazil (approx. 8 percent of GDP) are also much higher than in India (approx. 1.1 percent of GDP) (see also Figure 4.1), and are the highest in Latin America (UN-Habitat 2016c: 11-12). However, this does not necessarily mean that municipalities also divert substantial own revenues to climate action due to competing political priorities (Expert interview).

Only a few Brazilian municipalities—six out of a total of 5570—have developed their own **comprehensive local climate policies** (Barbi and Ferreira 2017). However, the number of municipalities that have established some form of climate bill or act is much higher: according to a 2009 survey by the National Confederation of Municipalities (*Confederação Nacional de Municípios*), 197 municipalities (3.9 percent of respondents) had “a bill or act creating municipal policies for climate change” (World Bank 2010b: 46). The number of cities that have developed regulations to put these policies into practice is however much lower (112), and only 60 municipalities “claimed to have a specific GHG emission goal” (ibid.: 46).

An example of local climate policy development is the city of São Paulo, which already set up a **Municipal Committee on Climate Change and Sustainable Economy** involving civil society, academia and local government stakeholders in 2005. São Paulo’s **Municipal Climate Law**, which was adopted in 2009, included mandatory overall emissions targets for the municipality as a whole, as well as sectoral measures (Valente de Macedo et al. 2016: 38). Examples of sectoral measures include reducing the fossil fuel use of public transit (transport sector), creating green spaces and increasing urban density (land use), and increasing energy efficiency of municipal lighting (energy) (WRI 2009). Other cities in Brazil that have developed climate policies, strategies and/or laws as well as concrete actions to implement them include Belo Horizonte, Recife and Fortaleza (ICLEI 2010, 2016a, 2016b).

In elaborating these policies, cities tend to engage in participative processes with stakeholders. They also often set up specialised institutions to advise and coordinate municipal climate policy. For example,

Belo Horizonte established a **Municipal Committee on Climate Change and Eco-efficiency**, and Rio de Janeiro established a **Forum on Climate Change and Sustainable Development** (Barbi and Ferreira 2017: 242; Kahn and Brandão 2015: 7). Belo Horizonte’s Municipal Committee on Climate Change and Eco-efficiency was established in 2006 to advise, support the coordination policies to reduce GHG emissions, and raise awareness (ICLEI 2010: 3). Its members include representatives of the municipal government, the City Council, the State Government, academia, civil society and business (ibid.). The Forum in Rio de Janeiro has a similarly inclusive character (Prefeitura do Rio de Janeiro 2011).

Participation in **city networks** played a role in shaping the climate policies that emerged in the city of São Paulo, as well as in other cities such as Recife, Fortaleza and Belo Horizonte (Valente de Macedo et al. 2016; ICLEI 2010, 2016a, 2016b). Specifically, São Paulo signed a technical cooperation agreement with ICLEI in 2003, which required that “the city engage in assessing its GHG emissions by developing a baseline inventory, which will lead to defining targets and developing a Local Action Plan based on the GHG inventory findings”, which should then be implemented and monitored (Valente de Macedo et al. 2016: 39). São Paulo followed these various commitments. ICLEI was moreover involved “in drafting the Municipal Climate Law, pushing forward the inclusion of reduction targets into the bill” (ibid.: 39). However, São Paulo’s involvement in transnational networks decreased after a change in municipal administration in 2013 (ibid.).

A range of São Paulo’s climate mitigation and adaptation efforts have been spotlighted as particularly good examples of local climate action by ICLEI, C40, the World Bank and the OECD—such as the capture and flare of methane gas from landfill sites in the city’s two large biogas power plants (Valente de Macedo et al. 2016: 40). Other successful mitigation measures implemented by São Paulo include switching to light-emitting diodes (LEDs) in traffic lights and when replacing old lighting systems in municipal buildings, and “improvements in public transport and urban mobility” such as switching to cleaner fuels for the bus fleet and expanding bike lanes (Valente de Macedo et al. 2016: 41). In terms of adaptation, measures

taken include expanding and revitalising existing parks, establishing new parks, measures in informal settlements (e.g. improving access to basic services and infrastructure), removing houses in risk areas, and addressing the proliferation of tropical diseases (ibid.: 40–1).

However, the impact of the policies has been limited and the targets have not been achieved, with one reason being the fact that some issues that are relevant to urban emissions reductions remain dependent on decisions at the national and state level (Valente de Macedo et al. 2016: 41). A change in municipal administration also led to shifting priorities at the local level. While São Paulo's commitment to climate action has thus faltered, other municipalities have been stepping up. For example, propelled by its strong involvement with C40 and role as a host of the Football World Cup in 2014 and Olympic Summer Games in 2016, Rio de Janeiro has emerged as a local climate action leader. Cities in the states of Pernambuco, Bahia, and Minas Gerais have also become more active in recent years (Expert interview).

Additionally, participation in city networks such as C40 and ICLEI is common, especially among the larger cities. There is moreover a network of the Secretaries of the Environment of the Capital Cities of the Brazilian States (CB27), which also holds discussions on climate change. Moreover, at least 12 Brazilian cities have conducted emissions inventories and submitted them to carbonn (cCR 2017a).

4.2.4 Brazil's challenges and opportunities

Lack of political continuity has been a challenge for climate action at all levels. Even though one government (for example in the city of São Paulo) may implement ambitious climate policies and laws, successive governments have often had quite different agendas and priorities. Consequently, despite ambitious climate goals and targets, policy implementation is often quite weak.

Improved coordination: Rather than developing in a clear “top-down” or “bottom-up” manner, climate policies at different levels in Brazil often developed independently and in parallel, and may have missed opportunities for synchronisation of the plans developed at different levels. However, efforts to support exchanges across different levels—such as municipal committees on climate change that also include representative from state governments—may help improve coordination.

Litigation as an opportunity: While the many ambitious climate laws that exist at different levels in Brazil may not all currently be fully implemented due to issues such as a lack of political continuity, litigation is likely to play an important role in the future and could be a trigger for strengthening implementation efforts (Expert interview). There is evidence of civil society organisations in different Brazilian jurisdictions considering litigation as an opportunity to put pressure on governments to implement existing climate laws (ibid.).

Emphasis on consultation and dialogue: The multi-level climate governance framework in Brazil emphasises consultation and dialogue. For example, the constitution stresses the importance of participatory local government. The Brazilian Forum on Climate Change is a national multi-stakeholder platform, which has moreover encouraged the creation of regional, state and municipal climate change forums with which it liaises. At the subnational level, it has been common for states and municipal governments to involve a range of stakeholders through consultative bodies.

City networks as catalysts for action: The case of São Paulo illustrates how transnational city networks can catalyse the development and implementation of climate policies at the local level by providing advice and guiding local governments along well established “steps” towards developing their own climate policies.

4.3 Multi-level climate governance in Colombia

4.3.1 Background: cities and climate change in Colombia

Colombia's urban population has increased from 45 percent of the total population in 1960 to 77 percent in 2016 (World Bank 2016b), in line with strong urbanisation rates in the Latin American region. Urban density—with more than 20,000 inhabitants per square kilometre—is among the highest in the world (Parés-Ramos et al. 2013).

Because of its large coastline and location in the Andes, Colombia is at high risk from climate change impacts. The scenarios offered in Colombia's Third National Communication on Climate Change predict an “increase in average temperatures of 2° to 4°C by 2070 and changed hydrological conditions” (UNDP Colombia 2010: 2). The prevention of risks has become central to the political and public agenda, strengthened in the aftermath of the 2010–2011 La Niña, which affected four million Colombians and causes economic losses of almost US \$8 billion (Hoyos et al. 2013). Sea-level rise, as well as floods, strong rainfall and landslides are expected to impact the economy and human settlements in urban centres. In the Andes, water shortage due to glacier retreat, compounded by land tenure insecurity, can affect food security, access to water resources and cause impacts on health (Côté et al. 2010).

Though not among the largest emitters globally, without strong and quick action on climate change mitigation, Colombia's emissions will grow significantly considering the country's projected economic growth (Government of Colombia 2011). As of 2009, the largest sectors in terms of GHG emissions were energy—in spite of the large share of renewable energy in the country—and agriculture (Jaramillo 2014). The energy mix entails 64 percent hydropower, 31 percent natural gas and coal and 15 percent of other sources and cogeneration.

Similarly to other countries in the region, high levels of poverty and inequality “interact with the potential impacts of climate change on the economics of the



region to provide a double challenge for adaptation” (UN-Habitat 2012: 2). Thus, the distribution of social opportunity, the appropriate delivery of services and the reach of social protection in cities take on particular significance in countries like Colombia.

4.3.2 Colombia's multi-level climate governance framework

Colombia is a unitary republic with 32 departments and 1,122 municipalities. The number of municipalities in each department varies widely. Most competences relevant to climate change are shared among the three levels of government (central, departmental and municipal). Departments have the responsibility of planning the development in their territory and coordinating with the municipalities in their jurisdiction. As part of the wave of decentralisation in Latin America in the 1990s, Colombia's Constitution of 1991 had a big impact on the multi-level governance framework, devolving powers to subnational governments and the financial resources required to implement them (OECD 2013).

Multi-level climate governance in Colombia can be described as hybrid with a long-term trend and consensus among the different levels of government towards more bottom-up participation. According to the OECD, “although a unitary state, Colombia has become one of the more decentralised countries in Latin America” (OECD 2013: 209). This is embodied by the national

development policy system, in which subnational entities implement decisions and strategies initially designed at the national level while concentrating on promoting their own region's development (ibid.).

An essential accomplishment in the country has been the institutionalisation of climate change policy beyond just the portfolio of one ministry and into the Ministries of Transport, Mines and Energy, Commerce and Industry, Agriculture and Rural Development, and Housing, Cities and Territories (see also section 4.3.3). Above all, climate change is understood in the country as a cross-cutting issue that needs to have institutional homes across all levels of government (Expert interview).

4.3.3 Key instruments in Colombia

National level

The system for multi-level climate governance in Colombia has developed substantially in recent years at the initiative and command of the national government. The Colombian government adopted the UNFCCC in 1994 and submitted its INDC in 2015. The main institution charged with coordinating policy on climate change in the country is the **Ministry of Environment and Sustainable Development** (*Ministerio de Medio Ambiente y Desarrollo Sostenible*, MADS). In practical terms, several climate change coordination tasks are shared between MADS and the **National Planning Department** (NPD), which is located under the Presidency. The NPD is a technical entity in charge of developing the Colombian five-year National Development Plans and distributing the national budget with the Finance Ministry accordingly. These two institutions alternate annually the presidency and secretariat tasks of the Colombian **National Climate Change System** (*Sistema Nacional de Cambio Climático*, SISCLIMA) (see more information below). Since 2006, climate change has been covered by Colombia's National Development Plans, which establish the vision for the country's development and the overarching goals and objectives for growth and development.

Through Presidential Decree No. 298 of February 2016, the **SISCLIMA** was established as the main institutional arrangement governing climate in the country and charged with the coordination of all of

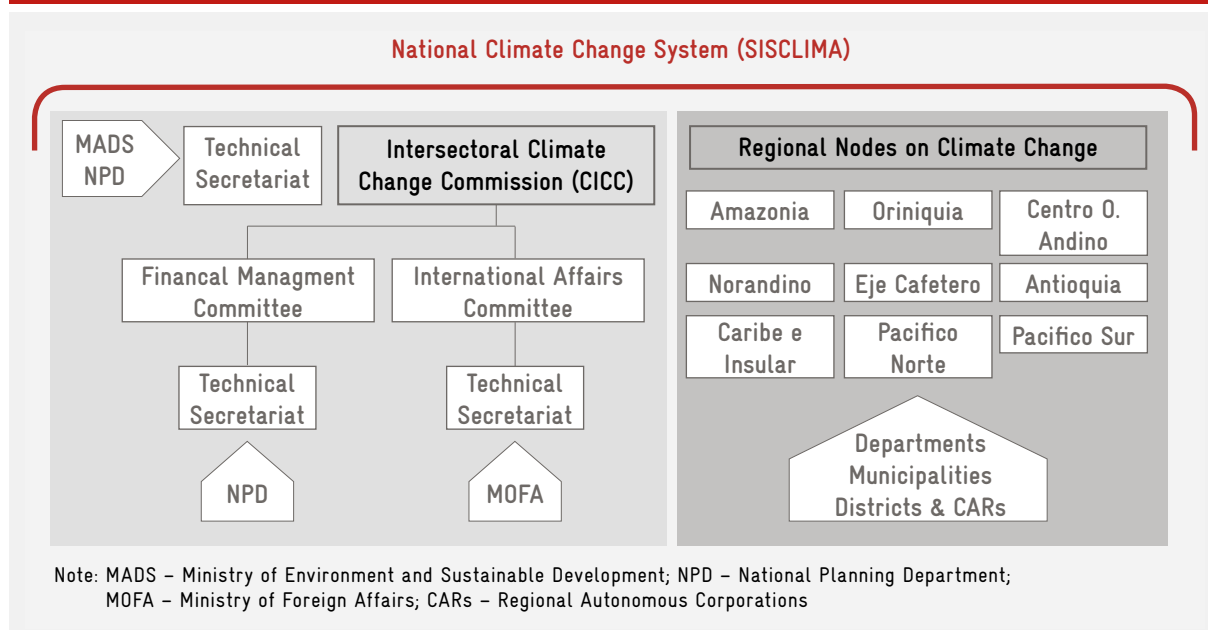
Colombia's climate change efforts and commitments at the local, departmental, national and international levels (Jaramillo 2014). The MADS was the lead in the adoption of the SISCLIMA, supported by the National Planning Department and the Ministries of the Interior, Finance, Agriculture and Rural Development, Mining and Energy, Transport, and Foreign Affairs (Expert interview).

The SISCLIMA is composed of two entities—the **Intersectoral Climate Change Commission** (CICC) and the **Regional Nodes on Climate Change** (See Figure 4.2 below). The CICC has a technical secretariat chaired in rotation by the MADS and the NPD. Under the CICC, there are two coordinating committees—one for financial management related to climate policy in the country, and one for negotiations at the UNFCCC and coordinating all other international affairs. The committee for financial management is chaired by the NPD and has the participation of development banks and representatives of commercial banks (Expert interview). The committee for international affairs is chaired by the Ministry of Foreign Affairs.

Regarding national legislation, in 2017, the **National Climate Change Bill** was submitted by the MADS to the National Congress for approval (Ministry of Environment and Sustainable Development 2017a)

Regarding adopted policies, Colombia's **Climate Plan to 2030** includes both adaptation and mitigation and commits to an unconditional 20 percent emissions reduction by 2030 with respect to business as usual, and a conditional additional 10 percent (Araya 2015). The national government has defined **four climate change priority strategies**: the Climate Change National Adaptation Plan (CCNAP) of 2012, which is coordinated by the NPD; the 2012 Colombian Low Carbon Development Strategy (*Estrategia de Desarrollo de Bajo Carbono*, CLCDS), which prioritises seven sectors for emissions reductions: agriculture and livestock, energy, transport, housing, industry, mining and hydrocarbons and waste and is coordinated by the MADS (Government of Colombia 2011); the National REDD+ Strategy, also coordinated by the MADS; and the Strategy for Fiscal Protection Against Natural Disasters.

Figure 4.2: Colombia's institutional arrangements governing climate



Currently, there is a focus on the sectoral and sub-regional levels. In terms of sectors, an important recent breakthrough for the CICC has been the agreement of a roadmap and a list of concrete actions per sector of the economy (Expert interview). **At the subnational level**, there is an important push towards a comprehensive framework that enables more control at subnational level through the **Regional Nodes on Climate Change**. The Regional Nodes are part of the SISCLIMA and promote, support and accompany implementation of climate change strategies, plans and projects in each region.

The national government is preparing at this time for the implementation of its NDC and the implementation of plans and projects to achieve the NDC objectives, working to improve the information and MRV system in the country, integrating mitigation and adaptation strategies, policies and activities and devising a strategy for attracting financing for sectoral implementation (Expert interview).

Regarding domestic climate finance, FINDETER is a public limited company connected with the Colombian Ministry of Finance that was established in order to allocate public investment for sustainable development **to the subnational level** and support its entities with planning, finance, and technical assistance

(FINDETER 2017). In addition, a state-owned bank (Bancoldex) has mitigation and adaptation initiatives targeted towards the private sector. Bancoldex issues green bonds to finance climate change adaptation and mitigation projects with the support of the Inter-American Development Bank (IADB) (Bancoldex 2017).

The **National System of Royalties** (*Sistema General de Regalías*) is a broad funding instrument based on royalties from the exploitation of non-renewable resources in Colombia, which are pooled at the central level and then allocated to departments and municipalities. The main objectives of the scheme are to promote investment at the subnational level, incentivise micro-energy projects and redistribute national income. In average, about 25 percent of the investments in Colombian departments and municipalities come from this source (National Planning Department 2015). Though not originally related to climate change goals, for the biannual period of 2017–2018, 5.1 percent of the budget of the National System of Royalties was made mandatory for disaster risk reduction and climate change adaptation investment (about two hundred million US dollars) (Government of Colombia 2016). This availability of finance has provided incentives for the departments, municipali-

ties and Regional Autonomous Corporations (*Corporaciones Autónomas Regionales*, CARs) (see more information below) to institutionalise climate change priorities to be able to kick-start projects with the available funds (Expert interview).

During the 2010–2011 La Niña, the government of Colombia created the temporary National Adaptation Fund under the Ministry of Finance, but it faced challenges in implementing the funds allocated (Jaramillo 2014). However, the government is currently reviewing the potential of establishing a National Climate Change Fund (Jaramillo 2014).

Territorial level: Departments and municipalities

Colombia conceptualises the subnational governance level—composed of departments, municipalities and districts—as one integrated governance level (the territorial level or *nivel territorial*).

Each department has the responsibility of producing a development plan to implement the agenda promoted by the elected governor in line with the current National Development Plan. As an example, the Department of Huila in the south-west of the country has already included climate change in its development plan (Jaramillo 2014).

A unique entity in the Colombian context is the **Regional Autonomous Corporations** (CARs). The CARs are decentralised entities composed by jurisdictions in the same geographic or hydrographic ecosystem and with joint authority at the regional level. They are established with financial and administrative autonomy and for environmental objectives. This legal form exists in the country since 1993 and is established by law. The geographic extension or jurisdiction of CARs can vary, sometimes encompassing the territory of one, two or three department. CARs are autonomous and do not sit within government institutions, but comply with legal dispositions by the MADS (Expert interview). Some CARs have started discussing and implementing actions on climate change. For example, *Corporación Autónoma Regional del Alto Magdalena* (CAM) and *Corporación Autónoma del Río Grande de la Magdalena* (CORMAGDALENA) are involved in REDD+ initiatives (REDD Desk 2017).

The Association of Regional Autonomous Corporations (ASOCARS) groups the 33 CARs in the country, coordinates among them and represents them in discussions with national institutions (ASOCARS 2018).

As discussed above, currently the main instrument for climate governance on the subnational level are the **Regional Nodes on Climate Change**. After the passage of the presidential decree establishing them in 2016, the Regional Nodes are in their inception stage and some Nodes have been institutionalised more strongly than others; some are technically stronger than others and some enjoy stronger political support than others (Expert interview). The jurisdictions encompassed by the respective Regional Nodes are diverse. Within the Regional Nodes, jurisdictions have been grouped based on geographic, hydrological and cultural affinity, and where joint territorial initiatives were already in place.

Each Regional Node is composed by one or more departments, several municipalities and CARs—but also NGOs, academia, and research institutes—and is in charge of defining its own internal regulations, including the Regional Node's governance, chair organisation, delimitations, member's responsibilities and action plans. For example, some Regional Nodes are currently headed by research institutes, others by departments and others by municipalities. In the process, the MADS and NPD guide the different Regional Nodes and provide technical and institutional advice (Expert interview).

Crucially, an important next step at this level is to adopt Integrated Territorial Climate Change Plans (*Planes Integrales de Gestión de Cambio Climático Territoriales*, PIGCCT) for the entire territory. As examples, the Capital Region Bogotá-Cundinamarca adopted its Plan in 2016, followed by the Departments of Magdalena and Quindío, who adopted its PIGCCT in July of 2017, and the Department of Chocó.

Municipal level

Several larger Colombian cities of different sizes are forerunners in climate action. For example, Medellín, which is part of the Rockefeller's 100 Resilient Cities, has been hailed as a leading example of urban transformation and social and environmental resilience only decades after being one of the most violent cities

in the world (Ijjasz-Vasquez 2017). Bogotá, Cartagena and Montería are additional cities, where mainstreaming of climate change into the development plans has already taken place (Jaramillo 2014).

Five metropolitan areas have established institutional entities encompassing two or more neighbouring municipalities that share a common labour market, transportation infrastructure (OECD 2013) and/or authority in the fields of transport, mobility, environment and urban planning (Expert interview). The five metropolitan areas are Valle de Aburrá (Medellín and eight neighbouring municipalities), Bucaramanga (Bucaramanga and three neighbouring municipalities), Barranquilla (Barranquilla and four neighbouring municipalities), Cúcuta (Cúcuta and five neighbouring municipalities) and Centro Occidente (Pereira and two neighbouring municipalities) (OECD 2013: 230). Although these entities have not yet been strongly linked to nationally-established climate change priorities in the country (Expert interview), they have the potential to contribute to NDC implementation and offer opportunities for horizontal inter-municipal cooperation.

4.3.4 Colombia's challenges and opportunities

A comprehensive and unified system: In comparison with other multi-level governance frameworks in different countries, in which fragmentation among actors, sectors and efforts is widespread, Colombia stands out as an interesting case in which a comprehensive multi-level governance system with assigned institutions at all levels has been introduced. While the process is in its inception stages, it is remarkable that different actors at different levels seem unified and agree on the goals and next steps of SISCLIMA. In theory, the range of instruments and institutions that compose SISCLIMA is adequate. The next few years of implementation will allow the country to assess the extent to which it is effective for the implementation of its NDC in practice.

Political prioritisation and continuity: The government of Colombia is currently amidst one of the most important political processes in its history—the implementation of the Peace Agreement with the rebel group Revolutionary Armed Forces of Colombia (FARC). After 52 years of armed conflict, the success

of the peace process is the absolute priority for the national government. For the climate agenda, an important challenge will be to frame climate policy as a priority complementary to the peace process and not a competing one. The presidential elections in May 2018 play an important role with regard to political continuity including securing support for the roll-out of the SISCLIMA as a central instrument to implement Colombia's NDC (Expert interviews).

Bridging the gaps between the national and the territorial levels: Colombia has traditionally had very strong policies and regulations designed and adopted by the central government for the territorial level, but not necessarily implemented to the same extent in departments and municipalities. Initiatives on climate change adaptation, disaster risk reduction and climate change mitigation are in place in the country, both at the national and at the territorial levels, but they are fragmented. Now the challenge lies in successfully implementing the SISCLIMA, and particularly the Regional Nodes as an instrument to bridge the two levels—the national and the sub-national level.

Consultants and international development agencies: In the process of elaborating the Sectoral Climate Change Action Plans (*Planes de Acción Sectorial de Mitigación para el Cambio Climático*, PAS), the Ministries of Transport, Mines and Energy, Commerce and Industry, Agriculture and Rural Development, and Housing, Cities and Territories built human resource capacities on climate change: All relevant ministries count with one (dedicated) climate change person or a team of two. This embodies the cross-cutting nature of climate change and is a great development in Colombia. Often, however, these members of staff are consultants financed by development cooperation and not absorbed by the respective ministry's budget. For example, the staff members in charge at the Ministry of Finance and Public Credit were financed through cooperation with the Inter-American Development Bank and the staff at the Ministry of Agriculture and Rural Development through cooperation with the UN Food and Agriculture Organisation (FAO). This has been the strategy of the ministries in the short-term. In the medium-term, ministries expect to be able to absorb the staff in place through their own budgets (Expert interview).



4.4 Multi-level climate governance in South Africa

4.4.1 Background: cities and climate change in South Africa

South Africa's urban population is currently 65 percent of the country's total population (World Bank 2016b). By 2030 it is expected to grow to approximately 70 percent and to 80 percent by 2050 (National Treasury of South Africa 2012; SEI et al. 2015: 1), which will mean that an additional 13.8 million people will live in South Africa's cities by 2050. According to the National Treasury, the rate of urbanisation has been outpacing economic growth. South Africa's cities — in spite of their progress in expanding access to basic services — are facing fundamental challenges of equitable growth, poverty and inclusion of the poor, provision of sufficient housing with adequate services, urban unemployment, and the persistent legacy of apartheid patterns of spatial exclusion and segregation (National Treasury of South Africa 2012).

There is an acknowledgement in the country that these problems will be exacerbated by climate change impacts and that the urban poor will be among the most affected by the implications of climate change, including for example flooding in low-lying informal

settlements and job cuts in industries that need to reduce emissions (National Treasury of South Africa 2012).

South Africa is currently the 13th highest GHG emitter in the world (Global Carbon Project 2016). 45 percent of South Africa's energy is consumed by industry, 20 percent by transport and 10 percent by the residential sector (Wolpe and Reddy 2015: 6). Within this picture, the eight metropolitan municipalities (metros) and seven largest secondary cities produce 30 percent of the national energy-related emissions. The majority of emissions in the eight metropolitan municipalities come from the "residential, commercial, government and industrial sectors" (SEI et al. 2015: 1).

Regarding adaptation to the impacts of climate change, according to the 2013 South African Long Term Adaptation Scenarios "warming relative to 1986–2005 of 3–6 °C by 2081–2100 in the interior" and precipitation changes are some of the main impacts. "Climate change poses a significant threat to South Africa's water resources, food security, health, infrastructure, as well as its ecosystem services and biodiversity" and thus to socio-economic development (Ziervogel et al. 2014: 606). Possible impacts on water supply and demand in cities have been the subject of several studies across the country (ibid.: 606). The current wave of droughts in Western Cape is bringing more attention to the impacts of climate change.

South Africa's urban challenges around climate change mitigation and adaptation are closely linked to aspects that have become rooted during the apartheid era, and which have a close relation to inequalities entrenched in the urban space. The urban form in South African cities has its origins in apartheid's "inequitable and segregated spatial-land distribution policies, but is also a consequence of modernist planning, which emphasises suburban development and separation of work and leisure" (Wolpe et al. 2012: 5). The country's cities are developing and have historically developed along sprawling, low-density suburban lines, "resulting in substantial transport inefficiencies" (Wolpe and Reddy 2015). After Apartheid, in 1994, 37 percent of households had electricity, and while this was up to 87 percent by 2014, energy poverty in the country is still a problem (Department of Energy

Statistics in Joubert 2016). Today, the efforts to improve this have implications for mitigation, as 95 percent of the country's electricity is produced from coal (Wolpe and Reddy 2015).

4.4.2 South Africa's multi-level climate governance framework

South Africa is a parliamentary republic with three levels of government: a national, a provincial, and a local level that are “distinctive, interdependent and interrelated”. The country has 9 provinces and 257 municipalities (8 metropolitan municipalities, 44 district municipalities and 205 local municipalities). In its 3rd chapter, the 1996 Constitution stipulates a “cooperative governance” framework between the three levels based on the principles to “co-operate with one another in mutual trust and good faith by fostering friendly relations; assisting and supporting one another; informing one another of, and consulting one another on matters of common interest; co-ordinating their actions and legislation with one another; adhering to agreed procedures; and avoiding legal proceedings against one another” (Government of the Republic of South Africa 1996). The Constitution prohibits transgressions of one level onto the area of functions of another level (Government of the Republic of South Africa 1996) and stipulates in its Annexes the functional areas of concurrent and exclusive national and provincial competence (Schedules 4–5). One of these areas is the environment, under which climate change is handled in the country. Cooperative governance is furthermore regulated through the Intergovernmental Relations Framework Act of 2005.

Local government plays a special role as key actor for a “developmental state” that works with citizens to find sustainable ways to meet their social, economic and material needs and improve life quality and to reverse the exclusion and legacy of apartheid. According to the 1998 White Paper on local government, “Developmental local government is intended to have a major impact on the daily lives of South Africans. Where municipalities do not develop their own strategies to meet community needs and improve citizens' quality of life, national government may have to adopt a more prescriptive approach towards municipal transformation” (Ministry for Provincial Affairs and

Constitutional Development 1998: 7). The four characteristics of local government with regard to the developmental state are to maximise social development and economic growth, integration and coordination, democratising development and leading and learning (ibid.: 23).

4.4.3 Key instruments in South Africa

National level

South Africa signed the UNFCCC in 1993 and ratified it in 1997. So far, South Africa's response to climate change has been embodied in regulation, policies, strategies and plans, not in comprehensive legislation addressing climate change (LSE 2017d), nor by constitutional mandate (Ziervogel et al. 2014). A Climate Change Bill is currently being developed. Several actors in the country have high hopes that it will formalise many aspects of climate change governance that already exist in the country, but will at the same time give clearer roles and mandates to different actors, including the three levels of government (Expert interviews). In addition, attempts to pass carbon tax legislation started in 2012 (LSE 2017d) but has stalled for years. At the time of finalising this study in early 2018, a second draft of the carbon tax bill is under consideration at the National Parliament (KPMG 2018; Expert interview).

South Africa's National Development Plan 2030 frames climate change as a development challenge. Still, the institution leading the coordination on climate policy in the country is the Department of Environmental Affairs (DEA). The first attempt to address climate change at the national level took place with the National Climate Change Response Strategy of 2004. Long-Term Mitigation Scenarios (LTMS) were developed for relevant sectors (waste management, agriculture, land use, transport and energy) in 2006 and endorsed by the Cabinet in 2008. The LTMS process provided the basis for the development of the **National Climate Change Response Policy White Paper (NCCRP)**. The NCCRP was adopted in 2011. It continues to be the main policy on climate change in the country and sets out the vision for “climate change-resilient” and low-carbon development. It has been described as the first

coherent adaptation and mitigation policy in the country (Ziervogel et al. 2014). The NCCRP declares that the provincial and local governments have significant roles in implementing climate policy and calls for a coordinated approach between the three levels of government (NCCRP 2011).

In 2009, South Africa made a (relative mitigation) commitment at the Conference of the Parties in Copenhagen to reduce emissions by 34 percent compared to the business as usual scenario by 2020 and 42 percent by 2025. In its **NDC**, the country reaffirms previous commitments, but now in the form of absolute targets: Between 398 and 614 MtCO₂e reduction over the period 2025–2030 and an additional 212 to 428 MtCO₂e reduction by 2050 (Government of the Republic of South Africa 2015).

DEA plays a key role as chair of the **Intergovernmental Climate Change Committee (IGCCC)** — a mechanism of coordination and consultation for policy implementation across levels of government on issues related to climate change — and the **National Climate Change Committee (NCCC)**, a multi-stakeholder mechanism between “government, business and industry, academia, NGOs and organised labour” (Parliamentary Monitoring Group 2011). Local level representatives consider the IGCCC a top-down institution (Expert interview). Across the sectors, DEA has also played a role of horizontal coordination, supporting the sectors that are relevant in dealing with climate change in the creation of climate change strategies (so far, sectors such as transport, energy, rural development, agriculture, water affairs, and health have embarked in this process with DEA’s support) (Expert interview).

With regard to vertical coordination among government levels in all policy fields (not just climate change), the main institution in the country is the **Department of Cooperative Governance and Traditional Affairs (CoGTA)**. CoGTA is tasked with an oversight role on municipalities and the mandate to ensure coordination and cooperation among the levels of government derived from Chapter 3 of the South African Constitution (Government of the Republic of South Africa 1996; Expert interview).

In accordance with the cooperative duty established in the Constitution, different national government

departments have kick-started local government or city support programmes, thus recognising the important role that cities and localities play in reaching climate change adaptation and mitigation targets and acknowledging strategies, plans and actions in relation to climate change taken in the municipal level (Expert interview). DEA is now rolling out a **Local Government Support Programme** in South Africa.

Additionally, the National Treasury is implementing its **Cities Support Programme**, working with the eight metropolitan municipalities and seeking “to increase cities’ contribution to inclusive economic growth through the unblocking of urban infrastructure bottlenecks; restructuring the apartheid city through the preparation of strategically located catalytic urban development projects, harnessing private sector capital to accelerate infrastructure investment” (National Treasury of South Africa 2017). The programme has five areas, including “climate resilience” (ibid.).

In terms of access to climate finance, the Government of South Africa has set up the **Green Fund** “to support green initiatives to assist South Africa’s transition to a low carbon, resource efficient and climate resilient development path delivering high impact economic, environmental and social benefits” (Department of Environmental Affairs 2018a). It is administered by the Development Bank of South Africa (DBSA) under commissioning by DEA (Green Fund 2017). The Green Fund has a Funding Window for Green Cities and Towns with focus areas on sustainable transport, sustainable waste management and recycling, renewable energy, including off grid and mini grid, sustainable water management, energy efficiency and demand side management, sustainable human settlements, the built environment and green buildings as well as ecosystem services (ibid.).

Provincial level

Provinces are mandated to support local government in the country. At the same time, “when a municipality cannot or does not fulfil an executive obligation in terms of the Constitution or legislation, the relevant provincial executive may intervene by taking any appropriate steps to ensure fulfilment of that obligation” (Government of the Republic of South Africa 1996).

Each sectoral ministry at the national level has a provincial counterpart. The provincial departments that work as counterparts to the national DEA vary in name by province. For example, the provincial department in KwaZulu Natal province is the Department of Agriculture, Environmental Affairs and Rural Development, while the one in Northern Cape province is the Department of Environmental Affairs and Nature Conservation (Department of Environmental Affairs 2018b).

In dealing with climate change, provinces are mandated to develop Provincial Climate Response Strategies (Expert interview), as well as vulnerability assessments. Western Cape (whose capital is Cape Town) was the first province to develop a provincial Climate Change Response Strategy and Action Plan adopted in 2008 (Western Cape Government 2008), which was updated in 2014 (Western Cape Government 2014; Expert interviews). DEA supported the development of these strategies with discussions to align the provincial strategy with the National Climate Change Response Policy (Western Cape Government 2014).

Municipal level

The mandate of municipal government in South Africa is “the provision of services to communities in a sustainable manner, the promotion of social and economic development and the promotion of a safe and healthy environment” (Government of the Republic of South Africa 1996). Numerous functions relevant to climate change mitigation and adaptation fall into the mandates of local government (*ibid.*). Among them are transport, public lighting, urban planning, infrastructure development and disaster management. Municipalities have executive authority over air pollution, building regulation, storm-water management, electricity and gas reticulation, firefighting, water and sanitation services, domestic waste management and sewage disposal.

Many South African cities and provinces are already taking initiative and climate change objectives are increasingly being adopted as part of the agenda of local and provincial government in the country. Nevertheless, adaptation and mitigation are in many cases not at the top of the local-level priorities (Expert interview).

Several cities were already forerunners in climate action before climate change became important on the national agenda. Notwithstanding the absence of a national policy framework, these cities started acting and responding to climate change since the early 2000s. eThekweni and the City of Cape Town have been leaders in establishing adaptation policies and plans that link current priorities with expected future considerations.

The main planning instrument for municipalities is the cross-sectoral **Integrated Development Plan (IDP)**, which has a five-year cycle and a corresponding budget. In 2011, DEA, CoGTA, SALGA and the GIZ developed the Let’s Respond to Climate Change Toolkit to support climate-mainstreaming efforts by municipalities in their IDPs. With the support of DEA and the operational support of NGO Sustainable Energy Africa, trainings with several local governments to support the mainstreaming of climate change mitigation and adaptation into IDPs have been conducted since 2012 (Expert interview).

An important platform for multi-level (climate) governance is the **South African Local Government Association**. SALGA is an association of all South African municipalities including metropolitan municipalities such as Johannesburg and Tshwane, district municipalities and local municipalities. It is accountable to its members and tasked with supporting them in their mandate of service delivery, socio-economic development and safeguarding of a health environment.

With regard to finance for climate responses at the local level, there are a number of national sources of funding that are in theory accessible to municipalities. The Municipal Finance Management Act No. 56 of 2003 (MFMA) of South Africa gives the fiscal and financial framework for cities in the country. However, several municipalities are not able to fund the tasks that they are mandated, to keep up with expenditure demands. The “current system of intergovernmental fiscal transfers has led to a growth in grant dependence by cities, while also reinforcing a sector-based silo mentality” because existing infrastructure grant and operating subsidy programmes seldom reward efficient and developmentally effective performance by cities (National Treasury of South Africa 2012).

A large portion of South African energy is electricity and almost 90 percent of that electricity is derived from coal (IEA n.d.). While generation and transmission of electricity in South Africa is almost entirely in the hands of the electricity supply industry (in essence the public utility Eskom, which supplies 95 percent of national electricity), distribution and electricity sales is a mandate shared with municipalities. Buying the electricity from Eskom and re-selling it to end-users is a significant revenue source for large municipalities (metropolitan municipalities and larger secondary cities in the country) (National Treasury of South Africa 2011). The large-scale adoption of renewable energy provision by other decentralised providers has thus a potentially significant financial impact on municipal revenue.

The Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) “is a programme developed to encourage private investment to help further develop the renewable energy sector within South Africa” (Energy Intelligence 2016). It “is a competitive bidding process used by national government to procure renewable energy generation capacity in line with the national Integrated Resource Plan (IRP) for Electricity 2010–2030” (Green Cape 2017: 13). It is managed by the IPP Office in the Department of Energy. The “programme is designed to contribute to meeting the national renewable energy target while encouraging foreign investment and developing socio-economic and environmentally sustainable growth” (Energy Intelligence 2016).

South Africa has a range of Strategic Infrastructure Projects (SIPs). In relation to these SIPs, the REIPPPP “fulfils the goal of providing clean and sustainable electricity combined with specifically mandated obligations to deliver socio-economic development benefits to local communities” (Green Cape 2017: 19).

4.4.4 South Africa’s challenges and opportunities

Visibility of the local level: In spite of efforts by national government to support and advise South African municipalities in their response to climate change, “when it comes to target-setting around climate change and defining what the country needs to do, local government is often voiceless [...]. Especially related to environmental issues, most of the systems that are in place are focused on the two [levels] of government” with concurrent powers: the national and provincial levels (Expert interview).

Monitoring and reporting: Another challenge, especially in the field of adaptation to climate change impacts, is the availability of data and the use of different measurements and indicators by different levels. At the municipal level, indicators and existing data focus on service delivery results, because this is the main mandate of municipalities. It can prove difficult to find existing data that can be aggregated and that is useful for making decisions on adaptation. In contrast, local data relevant to mitigation—for instance on energy and transport—is well-aligned with national-level indicators.

Bureaucratic burdens for local government and climate action: In the context of climate change, a problem raised in the literature is the burdens and limitations that the existing framework presents for cities, particularly in their ability to attract investors and to plan with a long-term perspective. In the development of projects to reduce greenhouse emissions with funding from the Clean Development Mechanism the Municipal Finance Management Act seems to restrict the ability of municipalities “to undertake contracts with a scope larger than three years without incurring fairly onerous requirements for consultation

with national and provincial government” (National Treasury of South Africa 2012: 6). In the energy field, “the biggest hurdles facing municipal power procurement are the current national regulations governing generation licensing and the need for a ministerial determination [...] to allow municipalities to purchase directly from independent power producers (IPPs). Currently, there is no precedent for this” (Green Cape 2017: 29).

Lack of finance: Finance for action on climate change at the local level and coordination for climate action at the provincial level has been indeed cited as one of the key challenges in the country (Expert interviews). Limited funding for qualified human resources at the provincial and local levels often leads to climate change being managed by one person who also has other environmental tasks in her or his portfolio (Expert interview). Multiple sources and experts sustain that this is the main challenge to tackle. “Unless dedicated funding is allocated from national government for local initiatives, it is unlikely that this work will be given priority in municipal budget allocations” (Wolpe and Reddy 2015: 17).



5 Conclusions

5.1 Key findings

Global recognition of cities' ability to contribute to the implementation of the Paris Agreement and the NDCs is needed. The potential for GHG emissions reductions in cities is substantial (although quantifications of this potential arrive at different results). If this potential is fully utilised, the world will be closer to closing the gap between the ambition of NDCs and the goal of keeping global warming below 2 or even 1.5 °C. Recognition of this potential is an essential precondition for the development of multi-level climate governance frameworks and instruments that are conducive to using the full potential for urban climate action.

A range of multi-level climate governance instruments are available to support and encourage the utilisation of this climate action potential. Information and knowledge, finance, coordination and cooperation as well as institutional capacities are main

dimensions of forward-looking policy development towards decarbonisation. Irrespective of whether a country is characterised by a top-down, bottom-up or hybrid multi-level climate governance context, instruments are available that allow local governments to become reliable partners in implementing the Paris Agreement. For example, in a top-down context, national governments may outline clear roles for local governments in the implementation of national climate policies and require them to mainstream climate change into their local development plans (Example: Uganda's National Climate Change Policy, section 3.3.1). In a bottom-up context, local governments and other subnational actors may push for more ambitious climate action and demonstrate the potential for reducing GHG emissions if the national government is unable, or unwilling, to implement its commitments under the Paris Agreement (Example: We Are Still In, section 3.1.1).

All countries benefit from some 'hybridity' in their multi-level climate governance frameworks. This

does not mean that all countries should strive to adopt hybrid multi-level climate governance frameworks. Rather, countries with top-down or bottom-up frameworks may benefit from very minor shifts. For example, countries with top-down frameworks can improve policies obligating local governments to implement climate action plans by listening to them to understand how national policies are actually supporting—or hindering—local implementation. Countries with strong bottom-up frameworks may benefit from a minimum of alignment with the national level to avoid incoherent approaches at the local level. And countries with hybrid multi-level climate governance frameworks can also benefit from studying the successes of countries with top-down and bottom-up approaches. Across all three types of multi-level climate governance frameworks, consultation and dialogue instruments that bring together different levels of government are beneficial to understand the positive or negative impacts that national policies have at the local level, facilitate discussions on how different levels of government can cooperate on climate action, and encourage buy-in for national policies.

Despite these generalisations, it is important to bear in mind that the concept of multi-level climate governance does not dictate a particular type or scope of instruments to be adopted. Thus, for example, while consultation and dialogue instruments will likely be part of any good multi-level climate governance instrument mix, there are also many different ways of implementing consultation and dialogue instruments: national policy coordination committees with participation of different ministries and different levels of government, national climate change forums with extensive participation by public and private actors, and regional climate change committees with links to national committees are just some of the possible options. The instruments chosen in a particular country have to fit the domestic context. However, it is also important to bear in mind that once selected, instruments create path dependencies. Thus, for example, decisions regarding who is included—or excluded—from consultation and dialogue formats will likely become entrenched for years.

Instruments are adaptable—and useful—for different political and institutional contexts.

For example, in a more top-down context, national

governments may require local governments to collect data on their mitigation and adaptation actions according to a harmonised national approach. This data can then be aggregated at the national level and be used to guide policy decisions. Conversely, in a context characterised by a multi-level climate governance framework leaning towards a bottom-up approach, the national government may not be involved in developing a harmonised approach to collecting local data on mitigation and adaptation activities. However, local governments may decide to independently monitor and publish reports on these issues to communicate what they are doing, and build a stronger case for more support from the national government or even international partners.

Instruments should not be seen as compartmentalised solutions that can be inserted into existing institutional and political contexts, but as part of an enabling policy mix for local climate action.

What local governments in different countries need to enable action depends largely on the domestic (national, local) context and on the interplay between different instruments (the policy mix). For instance, national climate change policies that specify a role for local governments will usually be more successful if they are accompanied by meaningful consultation platforms that involve representatives from different levels of government. Similarly, instruments to strengthen institutional capacities, for example by training expert personnel, can hardly work without a reasonable and sustainable finance stream, whether it is municipal own-source revenue, domestic finance or international finance.

Well-designed instruments are not only useful in a domestic climate policy context—they can also fulfil important functions in an international context (i.e. global implementation of the Paris Agreement). The area of monitoring and reporting is a good example of how climate action at the local level can link to global discussions on the implementation of the Paris Agreement. For example, the global stocktake is intended as a periodic assessment of “collective progress towards achieving the purpose of the Paris Agreement and its long-term goals” (Paris Agreement, art. 14). It is moreover supposed to “inform Parties in updating and enhancing [...] their actions and support” (art. 14, para. 3). While Decision

1/CP.21 (para. 99) suggests several inputs for the global stocktake (including e.g. information on the overall effect of NDCs, state of adaptation efforts, support, experiences and priorities, mobilisation and provision of support, IPCC reports, reports from subsidiary bodies), additional inputs may also be considered. Thus, if urban issues are in some manner covered by these or additional inputs, it is possible that countries learn that the scope for the ambitious climate action is greater if subnational action is considered. Countries may also be in a better situation to improve conditions for local climate action, based on revised understanding of scope for action, lessons learned from conducive frameworks for local climate action in other countries, etc.

5.2 Recommendations

The following recommendations can help guiding different target groups for the improvement of local climate action by employing multi-level climate governance approaches. Accordingly we outline, as far as possible, the different addressees: national governments, local governments, development agencies (e.g. GIZ).

5.2.1 Information and knowledge

Monitoring and reporting

The data gathered through monitoring and reporting helps to track progress, evaluate key challenges and incentives for implementation, and provide an evidence base for future policy decisions. Monitoring and reporting also helps local governments demonstrate their importance as climate governance actors.

Recommendation:

Government and international partners/cooperations should support the development of national programmes for city-scale GHG emissions inventories as well as local vulnerability assessments to ensure that the data collected is comparable and can be aggregated. This may also include (financial) support for adequately trained local personnel that are able to collect and analyse relevant data. National governments should also ensure that relevant available

data—e.g. national statistics—is spatially disaggregated to allow for comparisons of progress at the subnational level. International partners should support the identification of monitoring and reporting methodologies that lead to useful comparable data for mitigation and adaptation efforts at the local level.

Rationale:

- *All levels:* Information and knowledge are key strategic requirements to enable action at different levels.
- *Local:* Based on data from GHG sources and on climate change impacts, local governments are able to identify the key entry points and priorities for action.
- *National:* National governments are able to conduct progress-tracking and monitoring of implementation through data generated at the local level. This information in turn can be used as evidence for future policy decisions.
- *International:* Urban data can contribute to the implementation of the Paris Agreement through better understanding of local emissions levels.

Evidence from the case studies:

As discussed in section 3.1.1, the Global Protocol for Community Scale GHG Emissions Inventories is spearheading efforts to develop local emissions inventories that are compatible with IPCC guidelines for national emissions inventories, and can therefore be aggregated at the national level. Experience with the GPC has shown that regularly compiling local emissions inventories can be an important tool to help local governments understand the activities in their community that make the most substantial contribution to local GHG emissions (GPC 2014). This, in turn, can guide evidence-based policymaking for local climate action. The GPC has been applied in several of the countries discussed in chapter 4, including several cities in India and Brazil.

Certification and award schemes

Certification and award schemes recognise climate action efforts by local governments. Certification schemes guide and assess the adherence to standards, benchmarks and processes, and acknowledge this adherence through certification. Award schemes

honour outstanding achievements. Both certification and award schemes may incentivise local governments to engage in local climate action due to the benefits conferred by a certificate or label, such as increased recognition value. They may also influence the decisions of other actors, such as investors (who may prefer to invest in cities which have demonstrated a commitment to climate action as indicated by certification).

Recommendation:

National governments looking to establish long-term institutionalised processes supporting local climate action that contributes to the achievement of national targets should consider the introduction of certification schemes. Depending on the design of such certification schemes, they can also encourage the establishment of municipal climate management teams to guide local climate action in the long term. In addition, national and local governments can consider introducing certification and award schemes in certain sectors to encourage investment and innovation.

Rationale:

- *Local:* On-the-ground climate solutions are recognised (and ideally supported financially). Depending on the sector addressed, local governments can communicate arising co-benefits to other local governments.
- *National:* National governments obtain insights on solutions on the ground that can inform further national policies. National governments can moreover incentivise, recognise and identify standards, processes and benchmarks.
- *Private sector:* Based on the nature of the schemes, private sector players may have significant incentives to contribute to and benefit from innovative solutions.

Evidence from the case studies:

As discussed in section 3.1.2, a hallmark of several certification schemes — e.g. the European Energy Award and *Comuna Energetică* — is that they do not merely certify municipalities for adherence to certain standards, but aim to incentivise the creation of long-term, institutionalised processes for energy management. Crucially, the eea process requires that new

municipal energy management systems are coordinated by a dedicated team — not just an external consultant that comes in temporarily. Certification is only one step in this process: once cities have reached a certain level of achievement and impacts, they can be audited and certified according to the national eea. The fact that such energy management certification schemes are currently being piloted and implemented in a wide range of countries, including e.g. Austria, Chile, Morocco, Romania, Switzerland, and the Ukraine, indicates their wide appeal and adaptability to different contexts. Moreover, certification schemes can be applied to many different issues. While the abovementioned examples all relate to energy management, they are also applied to other issues. For example, South Africa's Green Building Council awards certification of green buildings according to international standards (section 4.4).

5.2.2 Finance

Municipal own-source revenues

The ability of local government to mobilise own-source revenues and its autonomy to determine how to allocate their expenditures can help ensure that climate action can be implemented at the local level. Most often, there is strong competition for national financial sources and alternative sources of income can provide a stronger argument for local climate action in a municipality.

Recommendation:

The overall principle of adequate fiscal decentralisation (not only strictly linked with tasks related to climate change mitigation and adaptation) should be upheld and provisions for its implementation should be established and put into practice by the national government. This clearly also has important repercussions to the climate change policy field, when local government tasks are related to climate change adaptation (for instance water service delivery, spatial planning and storm water management) and/or mitigation (for instance public transport planning and provision, waste management). National governments can help to strengthen the resource base of local governments for targeted functions related to climate policy that are particularly important in the country's NDC.

Moreover, national governments and/or relevant partners should carry out assessments examining the extent to which existing domestic policy and regulatory frameworks allow or impede municipal resource-raising power. In addition, processes of “climate-sensitive local budgeting” may be supported, depending on the degree of fiscal, administrative and public sector decentralisation enabled by higher levels of government. Local governments should carry out assessments of financial needs and opportunities to leverage own resources. In addition, local governments should raise awareness and communicate to their constituencies the socio-economic benefits that local climate action has.

Rationale:

- *Local:* Local governments gain more independence of intergovernmental transfers (or even international transfers) for policy formulation and improve their resource base for climate action.
- *National:* National governments can identify modifications in the domestic framework that can enable a better local revenue base for climate action. To the extent that local governments use their opportunities to generate own-source revenues for climate action in innovative ways, national governments can also promote successful innovations for adoption by other local governments.

Evidence from the case studies:

The Boulder Climate Action Tax (section 3.2.1) illustrates how a proactive local government can develop new sources of revenue for climate projects with the support of its citizens. While such ambitious initiatives may not be politically feasible in many countries, due to limited mandates or political issues associated with an additional tax on electricity use, there are also other options. For example, while there are few feasible instruments for municipalities in South Africa (section 4.4) to generate additional revenue for climate action, the City of Johannesburg has increased the refuse collection fee by 2 cents and will invest the proceeds into climate projects.

Domestic climate and development finance

Adequate allocations of domestic public finance (and redirected international finance) for local governments can be crucial to ensure that sufficient funding is available for the implementation of local climate actions.

Recommendation:

National governments should consider a financial needs assessment for local climate action as a pillar of NDC implementation. Based on this assessment, an investment plan (cross-cutting, sector specific) and/or specific funding arrangements can be established to support local climate activities.

Rationale:

- *Local:* Local governments benefit from financing sources that complement the existing locally-owned resource base.
- *National:* National governments can capitalise on the potential of local climate action by relying on and complementing existing municipal climate finance structures, or providing alternative sources of funding where the leeway for municipal own source revenues for climate action is too limited. This can complement NDC implementation measures at the national level to achieve intended mitigation and adaptation results.

Evidence from the case studies:

Sweden’s *Klimatklivet* (Climate Leap) is an example of a national subsidy scheme that supports local climate activities effectively (section 3.2.2). Its funding for measures such as infrastructure for electric vehicles, biogas plants, extensions of district heating networks, and cycle lanes or other bike infrastructure has in the period from 2015 to 2017 already enabled an estimated 760,000 tonnes of annual carbon dioxide reductions. Moreover, by requiring applicants to demonstrate that the measures they wish to implement are more ambitious than what is required by law, and demonstrate significant and lasting GHG emissions reductions, the *Klimatklivet* incentivises municipalities and other applicants to be particularly ambitious in their efforts.

Colombia’s (section 4.3) national royalties system (Sistema General de Regalías) is another example of an investment plan that supports local climate activities. This system is interesting for its dual incentive

function. Firstly, it promotes investment at the departmental and municipal level in micro-energy projects. Secondly, the royalties collected to fund the mechanism are derived from the exploitation of non-renewable resources (e.g. mining and oil).

5.2.3 Coordination and cooperation

National policy alignment

The alignment of national policies and coordination between levels of government can help to translate the targets to which countries have committed in their NDCs into concrete, multi-level implementation strategies. National policy alignment assists in implementing a coherent allocation of responsibilities and mandates between different levels and standardising approaches for the country.

Recommendation:

National, regional and local governments should initiate processes of policy coordination to help them define how to move from short-term objective to long-term targets and identify what role the different levels should play. Such processes should also aid in the identification of the concrete measures to be taken at different levels to ensure an enabling environment that is conducive to climate action.

Rationale:

- *All levels:* Processes of national policy alignment can help to establish clear mandates and responsibilities for different levels regarding implementation of NDCs.
- *Local:* Consultation and coordination processes allow insights from local governments to be included in national policies.
- *National:* These processes allow feedback and the evaluation of the effectiveness of national policies on the ground.

Evidence from the case studies:

In Colombia, the push for national policy alignment and mainstreaming climate change into country-wide development planning, multiple relevant sector ministries and across all levels of governance has been institutionalised in an all-encompassing system for multi-level climate governance launched by



presidential decree in 2016. As detailed in section 4.3.3, the National Climate Change System (SISCLIMA) coordinates all of Colombia's climate change efforts and commitments at the local, departmental, national and international levels. With this model, Colombia is moving from a myriad of fragmented initiatives for disaster risk reduction, climate change adaptation and mitigation to a long-term process with clear targets established in its NDC and a coherent all-encompassing system to govern multi-level climate governance and to link the country with the UNFCCC process.

Another promising step is South Africa's National Climate Change Response Policy White Paper (NCCRP) — adopted in 2011 —, which establishes the vision for climate change-resilient and low-carbon development. It has been described as the first coherent adaptation and mitigation policy in the country, specifically declares the significant roles in implementing climate policy of provincial and local government, and calls for a coordinated approach between the three levels of government.

Inter-municipal and regional cooperation

Inter-municipal and regional cooperation assist in addressing system-jurisdictional mismatches by reshaping and/or coordinating competencies at new scales, integrating spatial planning through relational and contractual schemes when climate-relevant

functions and systems (infrastructure systems or ecosystems) fall beyond the administrative boundaries of local and/or subnational governments.

Recommendation:

National governments should create rules and regulations in the domestic administrative and policy framework that are conducive to enable effective inter-municipal and regional co-operation. In addition, it can assess, when necessary, whether inter-municipal and regional instruments reshaping competences across jurisdictions are doing so in a manner aligned with democratic legitimacy.

Rationale:

- *Local:* Efficiency of local service delivery can be improved through the reduction of costs and economies of scale and scope. Inter-municipal and regional cooperation also allows local governments to bundle their expertise and power and to assure control over relevant assets and functions across boundaries.
- *National and regional:* Governance effectiveness can be increased through coherent regional strategies.

Evidence from the case studies:

In Brazil (section 4.2), lack of effective metropolitan governance structures has led to urban sprawl. Recognising this challenge, the federal government has supported the creation of new metropolitan agencies. Existing metropolitan agencies in Brazil moreover also work on climate-related issues. For example, the Inter-municipal Consortium of the Western Region (*Consórcio Intermunicipal da Região Oeste*, CIOESTE) integrates eight municipalities in the western region of the state of São Paulo, and works on issues related to climate change response through exchange but also joint contracts and procurement.

In Mexico, the Environmental Commission of the Megalopolis of Mexico (*Comisión Ambiental de la Megalópolis*) (section 3.3.2) is an interesting example of a metropolitan governance structure as it combines vertical and horizontal elements. Thus, the Commission involves not just subnational governments, but also the federal government of Mexico. It is thus an opportunity to coordinate on administration, planning and implementation of environmental issues in

the Mexico Valley surrounding Mexico City in both a horizontal and vertical manner.

Networks, city twinning and partnerships

Networks, city twinning and partnerships aggregate the voices of local governments and represent them vis-à-vis the national and international spheres. They also enable local governments in finding peers for sharing information, learning and knowledge. By associating with networks and partnerships, local governments can increase international recognition and prestige, and may gain access to international debates. Moreover, as indicated in chapter 2, collaboration with partners can be an important means for cities to deliver climate action despite a lack of control over specific assets or functions.

Recommendation:

Local governments looking to establish partnerships and combine their voice with those of other partners should assess whether joining such networks and partnerships is beneficial. Considering the regional biases in the membership of city networks mentioned in section 3.3.3, city networks should endeavour to communicate their tangible benefits—such as proven learning and diffusion of good practice—to a wider membership. National governments and international partners should recognise the value of city networks as a partner that can aggregate the concerns of local governments and communicate them to higher levels of government, and assist local governments in understanding and localising the Paris Agreement and NDCs. This implies, for example, supporting strong national city networks that have a broad and inclusive membership—not just the largest cities in a country.

Rationale:

- *Local:* Constructive relations with domestic and transnational peers facilitate exchanges of experiences and peer learning amongst local governments. Participation in networks may also be of value to local governments to the extent that it increases recognition and prestige.
- *National:* Domestic partnerships and networks can be a valuable partner to involve the voice of local government in consultations.

Evidence from the case studies:

The case of the city of São Paulo (section 4.2) illustrates the role that city networks can play in promoting learning and supporting ambitious climate action. São Paulo adopted a Municipal Climate Law at an early stage (2009), which included mandatory emissions targets and sectoral measures. The adoption of this law came after a technical cooperation agreement that the city signed with ICLEI in 2003, which required the city to compile a baseline emissions inventory, define emissions reductions based on this inventory, and a Local Action Plan (Valente de Macedo et al. 2016). Moreover, ICLEI supported the drafting of the Municipal Climate Law (ibid.). Thus, São Paulo benefited from the support and international experience of this city network. Moreover, the positive experiences of São Paulo were later used by ICLEI as good practices to share with other member cities.

5.2.4 Institutional capacities

Human resources and capacities

Adequate human resources and capacities are crucial to initiate, monitor, design and support the implementation of local adaptation and mitigation strategies and concepts most suitable to the local context. Well-capacitated institutions can serve as focal points or support horizontal and vertical coordination as well as key contact to coordinate climate action between different municipal departments and other key actors and entities. Skilled personnel are also important to raise awareness and create knowledge.

Recommendation:

National and local governments should ensure that adequate personnel working on climate change is attracted to the public sector and included in their budgets. Through its university system and national public administration academies, national governments should ensure high-quality education of skilled engineers, architects and public sector staff to prepare them to deal with climate change uncertainty, cross-cutting planning and specific technical issues related

to climate change mitigation and adaptation. International partners should continue supporting on-the-job capacity development for government officials in all departments of the local, regional and national level on climate issues.

Rationale:

- *All levels:* Skilled personnel and sufficient staff in the public sector are a necessary condition for local climate action.
- *Local:* Adequate personnel enables local governments, inter alia, to make use of available funding instruments, to develop and implement locally-owned local climate action plans on the ground, to connect climate change priorities meaningfully with their service delivery and socio-economic mandates and to respond to the needs of their local constituencies.
- *National:* Supporting training of municipal employees at the local level makes local governments effective partners in implementing NDCs. At the national level, e.g. ministerial employees need to have sufficient capacities and knowledge to be able to effectively coordinate climate policy across different ministries.

Evidence from the case studies:

In Germany, human resources and capacities for climate action by local governments are supported through multiple instruments. First and foremost, municipalities can apply for funding for a climate manager (*Klimaschutzmanager*) who is the focal point for local climate action, coordinates municipal climate activities, communicates and builds networks with all relevant stakeholders. Moreover, climate managers can make use of various forms of support, such as mentoring from more experienced climate managers, training programmes, and networking events. These and other measures have enabled Germany's National Climate Initiative (*Nationale Klimaschutzinitiative*) to implement more than 12,500 projects in more than 3000 municipalities since 2008 (BMU 2017a).

Bibliography

- adelphi and the Institute of Law and Environmental Governance (ILEG) 2018: Input Paper – Climate Change Governance in Kenya. Paper presented at the V-LED Africa Workshop, Irene, South Africa, 23–25 April, 2018.
- Alber, G. and K. Kern 2009: Governing climate change in cities – modes of urban climate governance in multi-level systems. In: *Competitive Cities and Climate Change*. OECD Conference Proceedings. Milan, Italy, 9–10 October 2008. Paris: OECD.
- Allers, M.A. and B. van Ommeren, B. 2016. Intermunicipal cooperation, municipal amalgamation and the price of credit. *Local Government Studies*, 42:5, 717–738.
- America's Pledge 2017a: About America's Pledge. Last accessed 21/12/2017, at <https://www.americaspledgeonclimate.com/about/>
- America's Pledge 2017b: America's Pledge Phase 1: States, Cities, and Businesses in the United States Are Stepping Up on Climate Action. New York, NY: Bloomberg Philanthropies.
- Ampaire, E., L. Jassogne, H. Providence, M. Acosta, J. Twyman, I. Winowiecki and P. van Asten. 2017: Institutional challenges to climate change adaptation: A case study on policy action gaps in Uganda. *Environmental Science and Policy* 75: 81–90.
- Anderton, K. and J. Setzer 2017: Subnational climate entrepreneurship: innovative climate action in California and São Paulo. *Regional Environmental Change*. Advance online publication. DOI 10.1007/s10113-017-1160-2.
- Araya, M. 2015: Colombia's Climate Plan seeks a new balance between mitigation and adaptation. Blog entry. Last accessed 16/01/2018, at <http://www.nivela.org/blog/colombia-s-climate-plan-is-out/en>
- Archer, D., S. Colenbrander, D. Dodman (eds.) 2016: *Responding to Climate Change in Asian Cities: Governance for a more resilient future*. Oxon and New York: Routledge.
- ASEAN 2018: ASEAN Cooperation on Environmentally Sustainable City. Last accessed 27/03/2018, at <http://environment.asean.org/awgesc/>
- Asociación de Corporaciones Autónomas Regionales y de Desarrollo Sostenible 2018: Qué es ASOCARS. Last accessed 12/04/2018, at http://www.asocars.org/monday/index.php?option=com_content&view=article&id=68
- Atteridge, A., M. K. Schrivastava, N. Pahuja and H. Upadhyay 2012: Climate policy in India: what shapes international, national and state policy? *Ambio* 41: 68–77.
- Ban Ki-moon 2016: Secretary-General's Message for 2016. Last accessed 03/07/2017, at <http://www.un.org/en/events/citiesday/messages.shtml>
- Banco nacional do desenvolvimento (BNDES) 2017: Climate Fund Program. Last accessed 12/12/2017, at https://www.bndes.gov.br/SiteBNDES/bndes/bndes_en/Institucional/Social_and_Environmental_Responsibility/climate_fund_program.html
- Bancoldex 2017: Bancoldex cierra con éxito primera subasta de bonos verdes en el mercado público colombiano. Last accessed 12/04/2018, at <https://www.bancoldex.com/Pagina-Principal/exitobonosverdesbancoldex2017.aspx>
- Bansard, J.S., P.H. Pattberg and O. Widerberg 2017: Cities to the rescue? Assessing the performance of transnational municipal networks in global climate governance. *International Environmental Agreements* 17: 229–246.
- Barbi, F. and L. da Costa Ferreira 2017: Governing climate change risks: subnational climate policies in Brazil. *Chinese Political Science Review* 2: 237–252.

- Barnard, S. 2015: Climate finance for cities: How can international climate funds best support low-carbon and climate resilient urban development? London: ODI.
- Bauer, A. and R. Steurer 2014: Multi-level governance of climate change adaptation: The role of regional partnerships in Canada and England. Discussion Paper 01/2014. Institute of Forest, Environmental, and Natural Resource Policy.
- Beermann, J., A. Damodaran, K. Jörgensen and M. Schreurs 2016: Climate action in Indian cities: an emerging new research arena. *Journal of Integrative Environmental Sciences* 13(1): 55–66.
- Bernstein, S. and B. Cashore 2007: Can non-state global governance be legitimate? An analytical framework. *Regulation and Governance* 1: 1–25.
- Bird, N., S. Bawakyillenuo, N. Canales Trujillo, Z. Eshetu, G. Tumushabe, P. Yanda, M. Norman, C. Addoquaye Tagoe, A. Amsalu, N. Ashiabi, D. Mushi, T. Muhumuza, A. Kateka and B. Simane 2016: Public spending on climate change in Africa. Experiences from Ethiopia, Ghana, Tanzania and Uganda. London: Overseas Development Institute.
- Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (BMU) 2016: Klimaschutz in Zahlen. Fakten, Trends und Impulse deutscher Klimapolitik. Berlin: BMU.
- BMU 2016: Klimaschutzplan 2050 – die deutsche Klimaschutzlangfriststrategie. Last accessed 03/03/2018, at <https://www.bmu.de/themen/klima-energie/klimaschutz/nationale-klimapolitik/klimaschutzplan-2050/>
- BMU 2017a: Zahlen und Fakten. Last accessed 12/03/2018, at <https://www.klimaschutz.de/zahlen-und-fakten>
- BMU 2017b: Merkblatt Förderung einer Stelle für Klimaschutzmanagement. Hinweise zur Antragstellung. Berlin: BMU.
- BMU 2018a: Neue Runde: Wettbewerb “Klimaaktive Kommune 2018”. Last accessed 27/03/2018, at <https://www.klimaschutz.de/wettbewerb2018>
- BMU 2018b: Förderaufruf Kommunale Klimaschutz-Modellprojekte. Last accessed 27/03/2018, at <https://www.klimaschutz.de/modellprojekte>
- BMU 2018c: Kurze Wege für den Klimaschutz. Last accessed 27/03/2018, at <https://www.klimaschutz.de/nachbarschaften>
- BMU 2018d: Das Beratungsangebot des SK:KK. Last accessed 03/04/2018, at <https://www.klimaschutz.de/service/das-beratungsangebot-des-sk-kk>
- BMWi 2018: Marktanreizprogramm (MAP) 2018. Last accessed 27/03/2018, at <https://www.erneuerbare-energien.de/EE/Navigation/DE/Foerderung/Marktanreizprogramm/marktanreizprogramm.html>
- Broekhoff, D., P. Erickson and C. M. Lee 2015: What cities do best: Piecing together an efficient global climate governance. SEI Working Paper No. 2015–15. Seattle: SEI.
- Bulkeley 2010: Cities and the Governing of Climate Change. *Annual Review of Environment and Resources* 35: 229–53.
- Buser, M. 2013: Democratic Accountability and Metropolitan Governance: The Case of South Hampshire, UK. *Urban Studies*. Volume: 51 issue: 11, page(s): 2336–2353.
- C40 2016: C40 Cities Finance Facility. Last accessed 28/08/2017, at <http://www.c40.org/other/cities-finance-facility>
- C40 and Arup 2015: Powering Climate Action: Cities as Global Changemakers. London: C40 and Arup.
- C40 2018a: C40 Cities Bloomberg Philanthropies Awards. Last accessed 27/03/2018, at <http://www.c40.org/awards>
- C40 2018b: C40 City Advisers. Last accessed 03/04/2018, at http://www.c40.org/programmes/city_advisers
- Capizzi, P., E. Castro, I. Gonzalez, R. Kehew, J. Lindemann, P. Lizarazo, T. Marmon and M. van Staden 2017: Enabling subnational climate action through multi-level governance. Bonn: GIZ.

- cCR 2016: carbonn Climate Registry 2015–2016 Digest: How Measurable, Reportable, Verifiable (MRV) Local Climate Action can raise the level of ambition in the Nationally Determined Contributions (NDCs). Bonn: Bonn Center for Local Climate Action and Reporting.
- cCR 2017a: carbonn Climate Registry. Last accessed 13/07/2017, at <http://carbonn.org/>
- cCR 2017b: Rajkot Municipal Corporation. Last accessed 26/03/2018, at http://carbonn.org/city_profiles/Rajkot_Municipal_Corporation
- CPR 2017: Episode 19: Unpacking the Smart Cities Mission in India. Podcast. Last accessed 28/09/2017, at https://soundcloud.com/cpr_india/episode-19-unpacking-the-smart-cities-mission-in-india
- Charbit, C. 2011: Governance of Public Policies in Decentralised Contexts: The Multi-level Approach”, OECD Regional Development Working Papers, 2011/04, OECD Publishing. Last accessed 10/08/2017, at <http://dx.doi.org/10.1787/5kg883pkxkxhc-en>
- Charbit, C. and M. V. Michalun 2009: Mind the gaps: Managing mutual dependence in relations among levels of government. OECD Working Papers on Public Governance No. 14. Paris: OECD Publishing.
- City of Boulder 2017a: Climate Action Tax. Last accessed 21/12/2017, at <https://bouldercolorado.gov/climate/climate-action-plan-cap-tax>
- City of Boulder 2017b: Boulder’s Climate Action Plan (CAP). Boulder, CO.: City of Boulder.
- City of Boulder 2017c: Energy Future. Last accessed 21/12/2017, at <https://bouldercolorado.gov/energy-future>
- Climate Alliance 2018: Climate Star. Last accessed 27/03/2018, at <http://www.climatealliance.org/activities/campaigns-and-more/climate-star.html>
- Climate Bonds 2017: Metropolitan transit Authority. Last accessed 21/12/2017, at <https://www.climatebonds.net/standards/certification/metropolitan-transport-authority>
- Cocco, M. and Pant, S. 2013. Financing Local Responses to Climate Change: Implications of Decentralisation on Responses to Climate Change. Published by UNCDF, UNEP and UNDP. Last accessed 10/01/2018, at http://www.asia-pacific.undp.org/content/dam/rbap/docs/Research%20&%20Publications/democratic_governance/RBAP-DG-2013-Financing-Local-Response-Climate-Change.pdf
- Comisión Ambiental de la Megalópolis 2017: Misión de la Comisión. Last accessed 10/01/2018, at <https://www.gob.mx/comisionambiental/que-hacemos>
- Compact of Mayors 2015: Climate Leadership at the Local Level: Global Impact of the Compact of Mayors. Last accessed 13/07/2017, at http://www.bbhub.io/mayors/sites/14/2016/01/BR_AggregationReport_Final_SinglePages-FINAL-2016.pdf
- Corfee-Morlot, J.; L. Kamal-Chaoui, M.G. Donovan, I. Cochran, A. Robert and P.-J. Teasdale 2009: Cities, Climate Change and Multilevel Governance. OECD Environmental Working Papers No. 14. Paris: OECD Publishing.
- Council of Europe, United Nations Development Programme (UNDP) and Local Government Initiative (LGI) of the Open Society 2010: Toolkit on Inter-Municipal Cooperation. Last accessed 14/12/2017, at <https://rm.coe.int/1680746ec3>
- Covenant of Mayors 2017: Covenant of Mayors twinning programme: Cities, regions, provinces ... Apply now! Last accessed 28/08/2017, at http://www.covenantofmayors.eu/news_en.html?id_news=838
- Côté, M., Martin, P., Gonzales, J., Cardona, A. 2010: Mainstreaming Climate Change in Colombia – Screening for risks and opportunity. Bogotá: United Nations Development Programme.
- Dellas, E., A. Carius, M. Beisheim, S. Parnell and D. Messner 2018: Local and Regional Governments in the Follow-up and Review of Global Sustainability Agendas. Berlin/Brussels: adelphi and Cities Alliance.

- Dellas, E., F. Schreiber and A. Carius 2016: Considerations for the Follow-up and Review of the New Urban Agenda. Berlin: adelphi.
- Department of Environmental Affairs (DEA) 2018a: About the Green Fund. Last accessed 12/05/2018, at <http://www.sagreenfund.org.za/wordpress/>
- Department of Environmental Affairs (DEA) 2018b: Provincial departments. Last accessed 12/04/2018, at https://www.environment.gov.za/contacts/provincial_offices
- Department of Environmental Affairs (DEA) 2011: National Climate Change Response Policy White Paper (NCCRWP). Pretoria: Department of Environmental Affairs.
- Deutsches Institut für Urbanistik (Difu) (eds.), in cooperation with Institut für Energie- und Umweltforschung Heidelberg GmbH (ifeu) and Klima-Bündnis, Climate Alliance 2011: Klimaschutz in Kommunen: Praxisleitfaden. Last accessed 12/01/2018, at <https://leitfaden.kommunaler-klimaschutz.de/sites/leitfaden.kommunaler-klimaschutz.de/files/pdf/klimaschutzleitfaden.pdf>
- Dubash, N. K. and N. B. Joseph 2016: Evolution of institutions for climate policy in India. *Economic and Political Weekly* 51 (3): 44–54.
- Eakin, C. 2015: China's "New Normal": Economic and Environmental Prosperity. Paulson Institute. Last accessed 16/01/2018, at <http://www.paulson-institute.org/paulson-blog/2015/07/30/china-new-normal-economic-environmental-prosperity/>
- El Universal 2017a: Entra Querétaro formalmente a la Megalópolis. El Universal, Online Version. Last accessed 12/01/2018, at <http://www.eluniversalqueretaro.mx/sociedad/11-08-2017/entra-queretaro-formalmente-la-megalopolis>
- El Universal 2017b: Alistan instalación de corredores para autos eléctricos. El Universal, Online Version. Last accessed 12/01/2018, at <http://www.eluniversal.com.mx/articulo/metropoli/cdmx/2017/06/6/alistan-instalacion-de-corredores-para-autos-electricos>
- Energy Cities 2018: Internal Contracting. Last accessed 14/03/18, at <http://www.energy-cities.eu/Internal-Contracting>
- Energy Intelligence 2016: Renewable Energy Independent Power Producer Procurement Programme. Last accessed 18/04/2017, at <http://www.energy-intelligence.co.za/reipp-all-you-need-to-know/>
- Engagement Global 2018: Deutsche Kommunen mit Klimapartnerschaften zu Afrika, Lateinamerika und Asien. Last accessed 03/04/2018, at <https://skew.engagement-global.de/kommunale-klimapartnerschaften.html>
- Erickson, P. and K. Tempest 2014: The contribution of urban-scale actions to ambitious climate targets. Somerville: SEI-US.
- European Climate Award 2018a: Der eea hat einen Zwilling bekommen – den eca. Last accessed 27/03/2018, at <http://www.european-energy-award.de/service/news/single/news/der-eea-hat-einen-zwilling-bekommen-den-eca/>
- European Commission 2018: European Green Capital. Last accessed 27/03/2018, at <http://ec.europa.eu/environment/europeangreencapital/>
- European Energy Award 2018a: Welcome to the European Energy Award. Last accessed 27/03/2018, at <http://www.european-energy-award.org/home/>
- European Energy Award 2018b: Process. Last accessed 27/03/2018, at <http://www.european-energy-award.org/european-energy-award/process/>
- Feruglio, N. and D. Anderson 2008: Chapter One – Fiscal Decentralisation: An Overview. Last accessed 18/04/2018, at <http://siteresources.worldbank.org/PSGLP/Resources/FeruglioandAndersonoverviewofFiscaldecentralization.pdf>
- FINDETER 2018: Ciudades Sostenibles y Competitivas. Last accessed 27/03/2018, at https://www.findeter.gov.co/publicaciones/ciudades_sostenibles_y_competitivas_pub
- FINDETER 2017: ¿Quiénes Somos? Last accessed 16/01/2018, at https://www.findeter.gov.co/publicaciones/38974/quienes_somos/

- Floater, G., D. Dowling, D. Chan, M. Ulterin, J. Braunstein and T. McMin. 2017. Financing the Urban Transition: Policymakers' Summary. London and Washington, DC: Coalition for Urban Transitions. Last accessed 10/01/2018, at <http://newclimateeconomy.net/content/cities-working-papers>
- FMDV - Global Fund for Cities Development 2016: The Potential Catalytic Role of Subnational Pooled Financing Mechanisms. Montreuil: FMDV.
- Fórum Brasileiro de Mudança do Clima (FBMC) 2017: Sobre. Last accessed 18/10/2017, at <https://forumbrasilclima.org/about/>
- Fraser Basin Council 2017: Board and Committees. Last accessed 14/12/2017, at https://www.fraser-basin.bc.ca/about_directors.html
- Friis-Hansen, E., B. Bashaasha and C. Aben 2013: Decentralization and implementation of climate change policy in Uganda. DIIS Working Paper 17. Copenhagen: Danish Institute for International Studies (DIIS).
- Greenhouse Gas (GHG) Protocol 2014: Global Protocol for Community-Scale Greenhouse Gas Emission Inventories: An Accounting and Reporting Standard for Cities. Washington: WRI.
- GIZ 2013: Subnational involvement in NAMA development: Current and emerging practice towards vertical integration. Bonn and Eschborn: GIZ.
- GIZ 2014: Vertically Integrated Nationally Appropriate Mitigation Actions (V-NAMAs): Policy and Implementation Recommendations. Bonn and Eschborn: GIZ.
- GIZ Brazil 2014: Fundo Clima – The Brazilian National Fund for Climate Change. Brasília: GIZ Brazil.
- Global Carbon Project 2016: Global Carbon Atlas – South Africa. Last accessed 18/04/2018, at <http://www.globalcarbonatlas.org/en/CO2-emissions>
- Global Taskforce of Local and Regional Governments (GTF) 2018: Local Authorities Major Group (LAMG). Last accessed 9/01/2018, at <https://www.global-taskforce.org/local-authorities-major-group>
- Government of Brazil 2015: Federative Republic of Brazil Intended National Determined Contribution. Brasília: Government of Brazil.
- Government of Chile 2017: Plan de Acción Nacional de Cambio Climático 2017–2022. Santiago: Ministerio del Medio Ambiente.
- Government of Colombia 2011: Colombian Low Carbon Development Strategy (CLCDS). Bogotá: Government of Colombia.
- Government of Colombia 2016: Presidential Decree 2190 of 28 December 2016 defining the Budget for the National Royalties System for 1st January 2017 to 31st December 2018. Bogotá: Ministerio de Hacienda y Crédito Público.
- Government of Colombia 2018a: Sobre el Sistema General de Regalías. Last accessed 27/03/2018, at <https://www.sgr.gov.co/Qui%C3%A9nesSomos/SobreelSGR.aspx>
- Government of Colombia 2018b: Fondo Adaptación. Last accessed 27/03/2018, at <http://sitio.fondoadaptacion.gov.co/>
- Government of Colombia 2018c: Nodos Territoriales y Sectoriales de Cambio Climático. Last accessed 03/04/2018, at <http://www.minambiente.gov.co/index.php/component/content/article?id=1695:plantilla-cambio-climatico-45>
- Government of Denmark 2012: Action Plan for a Climate-Proof Denmark. Copenhagen: Government of Denmark
- Government of Kenya 2010: The Constitution of Kenya, 2010. Nairobi: Government of Kenya.
- Government of Kenya 2013: National Climate Change Action Plan 2013–2017, Vision 2030 – A competitive and prosperous Kenya. Nairobi: Government of Kenya.
- Government of Kenya 2016: Climate Change Act, No. 11 of 2016. Nairobi: Government of Kenya.
- Government of India 2016: India's Intended Nationally Determined Contribution: Working Towards Climate Justice. Last accessed 26/03/2018, at <http://www4.unfccc.int/ndcregistry/Published-Documents/India%20First/INDIA%20INDC%20TO%20UNFCCC.pdf>

- Government of Israel 2015: Israel's Intended Nationally Determined Contribution. Jerusalem: Government of Israel
- Government of Mexico 2013: Convenio de Coordinación por el que se crea la Comisión Ambiental de la Megalópolis. Gaceta Oficial de la Ciudad de México, 3 de Octubre de 2013. Mexico City: Government of Mexico. Last accessed 11/04/2018, at http://dof.gob.mx/nota_detalle.php?codigo=5316255&fecha=03/10/2013
- Government of Mexico 2017: Estrategia Nacional de Calidad del Aire. Last accessed 11/04/2018, at <https://www.gob.mx/semarnat/documentos/calidad-del-aire-98085>
- Government of the Philippines 1975: Presidential Decree No. 0824, November 7, 1975, Creating the Metropolitan Manila and the Metropolitan Manila Commission and for other purposes. Last accessed 11/04/2018, at <http://www.official-gazette.gov.ph/1975/11/07/presidential-decree-no-824-s-1975/>
- Government of the Philippines 2018: About the People's Survival Fund. Last accessed 27/03/2018, at <http://psf.climate.gov.ph/about/>
- Government of Quebec 2018: Discover Electric Vehicles. Last accessed 27/03/2018, at <http://vehiculeselectriques.gouv.qc.ca/english/>
- Government of the Republic of South Africa 1996: Constitution of the Republic of South Africa 1996. Pretoria: Government of South Africa.
- Government of the Republic of South Africa 2015: South Africa's Intended Nationally Determined Contribution (INDC). Pretoria: Government of South Africa.
- Government of Uganda 2015: Uganda National Climate Change Policy. Kampala: Ministry of Water and Environment. Kampala: Government of Uganda.
- Gouldson, A., A. Colenbrander, A. Sudmant, E. Papargyropoulou, N. Kerr, F. McAnulla and S. Hall 2016. Cities and climate change mitigation: Economic opportunities and governance challenges in Asia. *Cities* 54: 11–19.
- Green Business Certification Inc. (GBCI) 2018: Building low carbon, climate-resilient cities. Last accessed 14/11/2018, at <https://cityclimateplanner.org/>
- Green Cape 2017: Utility-scale renewable energy 2017 Market Intelligence Report. Last accessed 23/09/2017, at <https://www.green-cape.co.za/assets/Uploads/GreenCape-Renewable-Energy-MIR-2017-electronic-FINAL-v1.pdf>.
- Green Fund 2017: South Africa Green Fund. Last accessed 28/09/2017, at <http://www.sagreenfund.org.za/wordpress/>
- Greenhouse Gas Protocol 2018: GHG Protocol for Cities. Last accessed 22/03/2018, at <http://www.ghgprotocol.org/greenhouse-gas-protocol-accounting-reporting-standard-cities>
- Hagerup, A. and K. Pallesen 2016: Inter-municipal cooperation on water management and climate adaptation for Usseroed Creek. Kokkedal: Municipality of Fredensborg.
- Hale, T. 2016: "All Hands on Deck": The Paris Agreement and Nonstate Climate Action. *Global Environmental Politics* 16 (3): 12–22.
- Hjerpe, M., S. Strbjörk, J. Alberth 2015: "There is nothing political in it": triggers of local political leaders' engagement in climate adaptation. *Local Environment* 20 (8): 855–873.
- Höhne, N., P. Drost, F. Bakhtiari, S. Chan, A. Gardiner, T. Hale, A. Hsu, T. Kuramochi, D. Puig, M. Roelfsema, S. Sterl 2016: Bridging the gap – the role of non-state action. In: *The Emission Gap report 2016: A UNEP Synthesis Report*. Nairobi: UNEP.
- Hooghe, L. and G. Marks 2003: Unraveling the central state, but how? Types of multi-level governance. *American Political Science Review* 97 (2): 233–243.
- Hoyos, N., J. Escobar, J.C. Restrepo and J.C. Ortiz 2013: Impact of the 2010–2011 La Niña phenomenon in Colombia, South America: The human toll of an extreme weather event. In: *Applied Geography*, Volume 39, May 2013, Pages 16–25.

- Huwiler, C. 2017: Municipal Energy Planning and Monitoring Approaches and Tools: A Comparative Analysis. Arlesheim: IDE-E.
- Huwiler, C. 2017: Supporting Local Climate Action through Multi-Level Governance - How to support cities in energy planning, management and monitoring? Presentation during the event “Supporting Local Climate Action through Multi-Level Governance” held at the GIZ in Bonn during the 23rd Conference of the Parties to the UN Framework Convention on Climate Change on 10/11/2017.
- Hsu, A., Y. Cheng, A. Weinfurter, K. Xu and C. Yick 2016: Tracking climate pledges of cities and companies. *Nature* 532: 303–6.
- Hsu, A., A. J. Weinfurter and K. Xu 2017: Aligning subnational climate actions for the new post-Paris climate regime. *Climatic Change* 142: 419–432.
- IEA 2018a: The National Plan for Addressing Climate Change (2013-2020). Last accessed 03/04/2018, at <https://www.iea.org/policiesandmeasures/pams/china/name-146231-en.php?s=dHlwZT1jYyZz-dGF0dXM9T2s,&return=PG5hdiBpZD0iYnJlY-WRjcnVtYiI-PGEgaHJlZj0iLyI-SG9tZTwvYT4gJnJhcXVvOyA8YSBocmVmPSlvcG9saWNpZXN-hbmRtZWZdXJlcy8iPlBvbGljaWVzIGFuZCB-NZWfzdXJlcwvYT4gJnJhcXVvOyA8YSBocm-VmPSlvcG9saWNpZXN-hbmRtZWZdXJlcy9jb-GltYXRlY2hhbmdlLyI-Q2xpbWF0ZSBDaGFu-Z2U8L2E-PC9uYXY->
- IEA 2018b: Basic Act on Energy Policy. Last accessed 03/04/2018, at <https://www.iea.org/policiesandmeasures/pams/japan/name-24372-en.php>
- ICLEI 2010: Belo Horizonte – MG, Brazil. Belo Horizonte’s steps towards a new solar energy legislation. Bonn: ICLEI.
- IEA 2018c: Brussels – Advice and aid in design and implementation: facilitateur bâtiment durable. Last accessed 03/04/2018, at <https://www.iea.org/policiesandmeasures/pams/belgium/name-24627-en.php>
- ICLEI 2016a: Recife, Brazil: Enhancing the participatory process when building a municipal climate change agenda. Bonn: ICLEI.
- ICLEI 2016b: Fortaleza, Brazil: Integrating greenhouse gas inventories as a decision making tool for informed action. Bonn: ICLEI.
- ICLEI 2017a: About Rajkot. Last accessed 26/0/2018, at <http://urbanleds.iclei.org/index.php?id=408>
- ICLEI 2017b: What is the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)? Last accessed 18/10/2017, at <http://www.iclei.org/activities/agendas/low-carbon-city/gpc.html>
- Ijjasz-Vasquez, E. 2017: How is Medellin a model of urban transformation and social resilience? Blog Entry. Washington D.C.: World Bank.
- ICAT 2018: Non-State and Subnational Action. Last accessed 22/03/2018, at <http://www.climateactiontransparency.org/icat-guidance/non-state-subnational-action/>
- IPCC 2014: Climate Change 2014. Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Geneva: IPCC.
- (IEA (without date): South Africa’s Role in Coal Energy. Last accessed 23/09/2017, at http://www.iea.org/ciab/South_Africa_Role_Coal_Energy_Security.pdf
- Jänicke, M. 2017: The multi-level system of global climate governance – the model and its current state. *Environmental Policy and Governance* 27 (2): 108–121.
- Jaramillo, M. 2014: The coordination of climate finance in Colombia. Policy Paper. London: Overseas Development Institute (ODI).
- Jha, V. 2014: The coordination of climate finance in India. London: ODI.
- Jørgensen, K., A. Mishra and G. K. Sarangi 2015: Multi-level climate governance in India: the role of the states in climate action planning and renewable energies. *Journal of Integrative Environmental Sciences* 12 (4): 267–283.

- Joubert, L. 2016: South Africa's changing energy landscape. Blog Entry. Last accessed 23/10/2017, at <https://energytransition.org/2016/08/south-africas-changing-energy-landscape/>
- Juhola, S. 2010: Mainstreaming Climate Change Adaptation: The Case of Multi-Level Governance in Finland. In: E. C. H. Keskitalo (Ed.), *Developing Adaptation Policy and Practice in Europe: Multi-level Governance of Climate Change*. Dordrecht/Heidelberg/London/New York: Springer.
- Kahn, S. and I. Brandão 2015: The contribution of low-carbon cities to Brazil's greenhouse gas emissions reduction goals: Briefing on urban energy use and greenhouse gas emissions. Seattle: SEI.
- Kamal-Chaoui, L. and A. Robert (eds.) 2009: *Competitive Cities and Climate Change*. OECD Regional Development Working Papers No 2. Paris: OECD.
- Kalfagianni, A. and P. Pattberg 2013: Global fisheries governance beyond the state: unraveling the effectiveness of the Marine Stewardship Council. *Journal of Environmental Studies and Sciences* 3(2): 184-193.
- Kern, K. and H. Bulkeley 2009: Cities, europeanization and multi-level governance: Governing climate change through transnational municipal networks. *Journal of Common Market Studies* 47 (2): 309-332.
- Keter, G. 2017: House rejects two nominees to National Climate Change Council. *The Star*, 11 January 2017. Online Version Last accessed 14/01/2018, at https://www.the-star.co.ke/news/2017/01/11/house-rejects-two-nominees-to-national-climate-change-council_c1485259
- Khan, M., A. Sagar, H. Saleemul and P.K. Thiam 2016: Capacity building under the Paris Agreement. European Capacity Building Initiative. Last accessed 12/01/2018, at http://www.eurocapacity.org/downloads/Capacity_Building_under_Paris_Agreement_2016.pdf
- Khosla, R. and A. Bhardwaj 2017: Mainstreaming Climate Actions in Indian Cities: Case study of Rajkot. Policy Brief. New Delhi: Centre for Policy Research.
- Klima-Bündnis e.V. 2018: Über den Klimaschutz-Planer. Last accessed 22/03/2018, at <https://www.klimaschutz-planer.de/>
- Knieling, J. 2006: Kooperation in der Regionalplanung. Theoretische Anforderungen, regionale Praxis und Perspektiven. In: K. Selle (Ed.), *Praxis der Stadt- und Regionalentwicklung*.
- KPMG 2018: South Africa – Carbon tax legislation, update. Last accessed 12/04/2018, at <https://home.kpmg.com/xx/en/home/insights/2018/02/tnf-south-africa-carbon-tax-legislation-update.html>
- Krause, R. 2013: The motivations behind municipal climate engagement: An empirical assessment of how local objectives shape the production of a public good. *Cityscape* 15 (1): 125–142.
- Kreditanstalt für Wiederaufbau (KfW) 2017a: Energetische Stadtsanierung – Zuschuss. Last accessed 27/03/2018, at [https://www.kfw.de/inlandsfoerderung/%C3%96ffentliche-Einrichtungen/Energetische-Stadtsanierung/Finanzierungsangebote/Energetische-Stadtsanierung-Zuschuss-Kommunen-\(432\)/](https://www.kfw.de/inlandsfoerderung/%C3%96ffentliche-Einrichtungen/Energetische-Stadtsanierung/Finanzierungsangebote/Energetische-Stadtsanierung-Zuschuss-Kommunen-(432)/)
- Kreditanstalt für Wiederaufbau (KfW) 2017b: IKK – Investitionskredit Kommunen. Last accessed 27/03/2018, at [https://www.kfw.de/inlandsfoerderung/%C3%96ffentliche-Einrichtungen/Kommunale-soziale-Basisversorgung/Finanzierungsangebote/Investitionskredit-Kommunen-\(208\)/](https://www.kfw.de/inlandsfoerderung/%C3%96ffentliche-Einrichtungen/Kommunale-soziale-Basisversorgung/Finanzierungsangebote/Investitionskredit-Kommunen-(208)/)
- Kreditanstalt für Wiederaufbau (KfW) 2017c: IKU – Investitionskredit Kommunale und Soziale Unternehmen. Last accessed 27/03/2018, at [https://www.kfw.de/inlandsfoerderung/%C3%96ffentliche-Einrichtungen/Kommunale-soziale-Basisversorgung/Finanzierungsangebote/Investitionskredit-kommunale-Unternehmen-\(148\)/](https://www.kfw.de/inlandsfoerderung/%C3%96ffentliche-Einrichtungen/Kommunale-soziale-Basisversorgung/Finanzierungsangebote/Investitionskredit-kommunale-Unternehmen-(148)/)
- Kreditanstalt für Wiederaufbau (KfW) 2017d: Energieeffizient Sanieren – Kredit. Last accessed 27/03/2018, at [https://www.kfw.de/inlandsfoerderung/Privatpersonen/Bestandsimmobilien/Finanzierungsangebote/Energieeffizient-Sanieren-Kredit-\(151-152\)/](https://www.kfw.de/inlandsfoerderung/Privatpersonen/Bestandsimmobilien/Finanzierungsangebote/Energieeffizient-Sanieren-Kredit-(151-152)/)

- Kreft, S., D. Eckstein and I. Melchior 2017: Global Climate Risk Index 2017 – Who Suffers Most From Extreme Weather Events? Weather-related Loss Events in 2015 and 1996 to 2015. Briefing Paper. Berlin: Germanwatch e.V.
- Landkreis Darmstadt-Dieburg 2018: Ergebnispräsentation: Integriertes Klimaschutzkonzept für den Landkreis Darmstadt-Dieburg und seine kreisangehörigen Kommunen. Last accessed 11/04/2018, at <https://www.ladadi.de/wirtschaft-infrastruktur-freizeit/energie-klimaschutz/klimaschutz-konzepte/integriertes-klimaschutzkonzept.html>
- Landkreis Fürth 2018: Integriertes Klimaschutzkonzept. Last accessed 11/04/2018, at <https://www.landkreis-fuerth.de/zuhause-im-landkreis/umwelt-und-bauen/klimaschutzkonzept.html>
- Landkreis Ludwigsburg 2018: Klimaschutzkonzept des Landkreises Ludwigsburg. Last accessed 11/04/2018, at <http://www.landkreis-ludwigsburg.de/deutsch/buerger-info/umwelt/klimaschutz-konzept-des-landkreises-ludwigsburg/>
- Landkreis Mayen-Koblenz 2018: Integriertes Klimaschutzkonzept für den Landkreis Mayen-Koblenz und seine Verbandsgemeinden und Städte. Last accessed 11/04/2018, at https://www.kvmyk.de/kv_myk/Themen/Energie%20&c%20Klima/Klimaschutzkonzept/
- Landkreis Miesbach 2018: Integriertes Klimaschutzkonzept. Last accessed 11/04/2018, at https://www.landkreis-miesbach.de/Landkreis/Klimaschutz/Integriertes_Klimaschutzkonzept/
- Lenhart, J. 2015: Urban Climate Governance: The Role of Local Authorities. Wageningen: Wageningen University.
- London School of Economics (LSE) 2017a. Countries: India. Last accessed 18/09/2017, at <http://www.lse.ac.uk/GranthamInstitute/country-profiles/india/>
- London School of Economics (LSE) 2017b. Countries: Brazil. Last accessed 18/09/2017, at <http://www.lse.ac.uk/GranthamInstitute/country-profiles/brazil/>
- London School of Economics (LSE) 2017c. Countries: Colombia. Last accessed 24/10/2017, at <http://www.lse.ac.uk/GranthamInstitute/country-profiles/colombia/>
- London School of Economics (LSE) 2017d. Countries: South Africa. Last accessed 23/10/2017, at <http://www.lse.ac.uk/GranthamInstitute/country-profiles/south-africa/>
- London School of Economics (LSE) Cities and UCLG 2016: Habitat III Policy Paper. 4 – Urban Governance, Capacity and Institutional Development. New York: Habitat III Secretariat.
- LSE 2018: The Climate Change Act (RA 9729), and its Implementing Rules and Regulations (IRR, Administrative Order No. 2010-01). Last accessed 03/04/2018, at <http://www.lse.ac.uk/GranthamInstitute/law/the-climate-change-act-ra-9729-and-its-implementing-rules-and-regulations-irr-administrative-order-no-2010-01/>
- Ministerio de Ambiente y Desarrollo Sustentable 2016: Gabinete Nacional de Cambio Climático. Last accessed 16/04/2018, at <http://ambiente.gob.ar/cambio-climatico/gabinete-nacional-de-cambio-climatico/>
- Ministerio de Energía 2018: 3er concurso elaboración de estrategias energéticas locales 2018. Last accessed 27/03/2018, at <http://atencionciudadana.minenergia.cl/tramites/informacion/24>
- Ministry for Provincial Affairs and Constitutional Development 1998: The White Paper on Local Government. Pretoria: Government of South Africa.
- Ministry of Environment and Sustainable Development of Colombia 2017a: Ministerio de Ambiente radica proyecto de ley de cambio climático. News release. Last accessed 16/01/2018, at <http://www.minambiente.gov.co/index.php/noticias/3121-ministerio-de-ambiente-radica-proyecto-de-ley-de-cambio-climatico>
- Ministry of Environment and Sustainable Development of Colombia 2017b: Corporaciones Autónomas Regionales. Last accessed 17/01/2018, at <http://www.minambiente.gov.co/index.php/noticias/2067>

- Montague, Z. 2016: China's Megacity in the Making. *The Diplomat*, 30 December 2016. Online Version. Last accessed 16/01/2018, at <https://thediplomat.com/2016/12/chinas-megacity-in-the-making/>
- MCTIC 2018: Comissão Interministerial de Mudança Global do Clima – CIMGC. Last accessed 03/04/2018, at http://www.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/cimgc/Comissao_Interministerial_de_Mudanca_Global_do_Clima__CIMGC.html
- Mueller, S.A., J.M. Harris, J. Sperling and M.J. Gutiérrez 2017: Forging low emission development paths in Latin America: Multi-level dynamics in the world's most urbanized region. LEDSGP. Last accessed 10/01/2018, at http://ledsgp.org/resource/multilevel-governance-low-emission-development-lac/?loclang=en_gb.
- Municipal Development Fund Office 2018: Financing Local Development Initiatives Through the MDFO. Last accessed 03/04/2018, at <http://www.mdfo.gov.ph/#>
- Municipality of Bremerhaven 2016: Klimaanpassungsstrategie für Bremerhaven und Bremen. Last accessed 03/04/2018, at <http://klimastadt-bremerhaven.de/klimaanpassung>
- National Planning Department 2015: Regalías le inyectan 'combustible' al PIB. Last accessed 16/01/2018, at <https://www.dnp.gov.co/Paginas/Regal%C3%ADas-le-inyectan-%E2%80%98combustible%E2%80%99-al-PIB.aspx>
- Nationale Stadtentwicklungspolitik 2013: Die Nationale Stadtentwicklungspolitik. Last accessed 03/04/2018, at http://www.nationale-stadtentwicklungspolitik.de/NSP/DE/Home/home_node.html
- National Treasury of South Africa 2017: Cities Support Programme. Last accessed 23/09/2017, at <https://csp.treasury.gov.za/Programmes/Pages/default.aspx>
- National Treasury of South Africa 2012: Cities Support Programme. Framework document, Final draft (January 2012). Last accessed 28/19/2017, at https://csp.treasury.gov.za/Resource%20_Centre/Conferences/Documents/Leadership%20Course%20Global%20Cities/Course%20Readings/CSP%20Framework%20-%20FINAL%20DRAFT%20-%202013Jan12.pdf
- National Treasury of South Africa 2011: Intergovernmental Fiscal Reviews (IGFR). Last accessed 28/10/2017, at <http://www.treasury.gov.za/publications/igfr/2011/>.
- OECD 2010: Cities and Climate Change. Paris: OECD Publishing.
- OECD 2013: Public Governance Reviews Colombia: Implementing Good Governance. OECD Public Governance Reviews. Paris: OECD Publishing.
- OECD 2014: Cities and Climate Change: National Governments Enabling Local Action. Paris: OECD Publishing.
- OECD 2016: The State of National Urban Policy in OECD Countries. Paris: OECD Publishing.
- OECD and UN-Habitat 2016: Habitat III Policy Paper 3 – National Urban Policy. Last accessed 21/12/2017, at <http://habitat3.org/wp-content/uploads/Policy-Paper-3-English.pdf>
- Oficina Municipal 2018: A oficina municipal. Last accessed 03/04/2018, at <http://www.oficinamunicipal.org.br/secao/1-a-oficina-municipal>
- Office of the President of the Philippines 2018: Climate Change Commission. Last accessed 03/04/2018, at <http://climate.gov.ph/>
- Parés-Ramos, I.K., N.L. Álvarez-Berrios and T. Mitchel Aide 2013: Mapping Urbanization Dynamics in Major Cities of Colombia, Ecuador, Perú, and Bolivia Using Night-Time Satellite Imagery. In: *Land*, 2, 37–59.
- Parliamentary Monitoring Group 2011: National Climate Change Response Policy: Department of Environmental Affairs Briefing. Last accessed 18/01/2018, at <https://pmg.org.za/committee-meeting/13662/>

- Peterson, J. 2017: Multi-level Governance and Innovations in the Financing of Urban Climate Change Strategies. In: Hughes, S., E.K. Chu and S.G. Mason (eds.): *Climate Change in Cities – Innovations in Multi-Level Governance*. Springer, International Publishing.
- Petrie, B. 2017: Supporting Local Climate Action through Multi-Level Governance – The role of finance for local climate action. Presentation during the event “Supporting Local Climate Action through Multi-Level Governance” held at the GIZ in Bonn during the 23rd Conference of the Parties to the UN Framework Convention on Climate Change on 10/11/2017.
- Prefeitura do Rio de Janeiro 2011: *Climate Change and Sustainable Development*. Last accessed 27/03/2018, at <http://www.rio.rj.gov.br/web/smac/climate-change1>
- Projektträger Jülich 2018: *Klimaschutzprojekte in sozialen, kulturellen und öffentlichen Einrichtungen (Kommunalrichtlinie)*. Last accessed 11/04/2018, at <https://www.ptj.de/klimaschutz-initiative-kommunen>
- Recabar, S. 2017: Supporting Local Climate Action through Multi-Level Governance – Local Policy Coordination and Cooperation in the Philippines. Presentation during the event “Supporting Local Climate Action through Multi-Level Governance” held at the GIZ in Bonn during the 23rd Conference of the Parties to the UN Framework Convention on Climate Change on 10/11/2017.
- REDD Desk 2017: *Association of Regional Autonomous Corporations (Colombia)*. Last accessed 17/01/2018, at <https://theredddesk.org/countries/actors/association-regional-autonomous-corporations-colombia>
- Republic of Peru 2015: *Intended Nationally Determined Contribution (INDC) from the Republic of Peru*. Lima: Republic of Peru.
- Republic of South Africa 2018: *Independent Power Producer Procurement Programme*. Last accessed 27/03/2018, at <https://www.ipp-renewables.co.za/>
- Reveco, C. 2017: Supporting Local Climate Action through Multi-Level Governance – The Comuna Energética programme. Presentation during the event “Supporting Local Climate Action through Multi-Level Governance” held at the GIZ in Bonn during the 23rd Conference of the Parties to the UN Framework Convention on Climate Change on 10/11/2017.
- Revi, A., D.E. Satterthwaite, F. Aragón-Durand, J. Corfee-Morlot, R.B.R. Kiunsi, M. Pelling, D.C. Roberts, and W. Solecki, (2014). *Urban areas*. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 535–612.
- Roccatti, M. 2007: *La Comisión Ambiental Metropolitana: Un nuevo esquema de coordinación. La constitución y el medio ambiente*. México: UNAM.
- Roelfsema, M., M. Harmsen, J.J.G. Olivier, A.F. Hof and D.P. van Vuuren 2018: Integrated assessment of international climate mitigation commitments outside the UNFCCC. *Global Environmental Change* 48: 67–75.
- Rotter, M., E. Hoffmann, J. Hirschfeld, A. Schröder, F. Mohaupt and L. Schäfer 2013: *Stakeholder Participation in Adaptation of Climate Change: Lessons and Experiences from Germany*. Dessau-Roßlau: Umweltbundesamt (UBA).
- San Francisquito Creek Joint Powers Authority 2018: *Agency Overview*. Last accessed 03/04/2018, at <http://sfcjpa.org/web/about/agency-overview/>
- Satterthwaite, D., Huq, S., Reid, H., Pelling, M. and Romero Lankao, P. 2007: *Adapting to climate change in urban areas: the possibilities and constraints in low and middle income nations. Human Settlements Working Paper Series Climate Change and Cities No. 1*. London: IIED

- Schwab, B., D. Kübler and S. Wälti 2001: Metropolitan governance and democracy in Switzerland: An attempt of operationalisation and an empirical assessment. Paper prepared for the Workshop “Governance and Democratic Legitimacy at the 29th ECPR Joint Session of Workshops, Grenoble, 6–11 April 2011.
- Schwarze, R. Meyer, P.B., Markandya, A. et al. 2016. Finance Opportunities for Climate Change Solutions in Cities. ICLEI Background Paper. Last accessed 01/08/2017, at http://resilientcities2016.iclei.org/fileadmin/sites/resilient-cities/files/Resilient_Cities_2016/Documents/RC16_Background_Paper_Schwarze_et_al.pdf
- Setzer, J. 2009: Subnational and transnational climate change governance: evidence from the state and city of São Paulo, Brazil. Paper presented at the Fifth Urban Research Symposium 2009. London: London School of Economics.
- Sharma, D. and S. Tomar 2010: Mainstreaming climate change adaptation in Indian cities. *Environment and Urbanization* 22(2): 451–465.
- Sino-German Urbanisation Partnership 2018: Sino-German Dialogue for Sustainable Cities. Last accessed 22/03/2018, at <https://www.sustainable-urbanisation.org/en/about>
- Smith, A. 2013: *The Climate Bonus: Co-Benefits of Climate Policy*. Oxon and New York: Routledge.
- 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.
- State Government of Victoria 2018: *Victoria’s Climate Change Framework*. Last accessed 03/04/2018, at <https://www.climatechange.vic.gov.au/victorias-climate-change-framework>
- Stockholm Environment Institute (SEI), Bloomberg Philanthropies and Sustainable Energy Africa 2015: *Cities and Climate Change in South Africa*. Stockholm: SEI.
- Subirats, J. 2017: Dilemmas: Multilevel Government, Network Governance, and Policy Co-production. In: Gómez-Álvarez, D., R. Rajack, E. López-Moreno and G. Lanfranchi (eds.): *Steering the Metropolis – Metropolitan Governance for Sustainable Urban Development*, 86–97. Washington, DC: Inter-American Development Bank.
- Swedish Environmental Protection Agency 2018a: Om Klimatklivet. Last accessed 10/01/2018, at <http://www.naturvardsverket.se/Stod-i-miljoarbetet/Bidrag/Klimatklivet/Om-Klimatklivet/>
- Swedish Environmental Protection Agency 2018b: Resultat för Klimatklivet. Last accessed 10/01/2018, at <http://www.naturvardsverket.se/Stod-i-miljoarbetet/Bidrag/Klimatklivet/Resultat-for-Klimatklivet/>
- Swedish Government 2018: Summary of the Government’s budget initiatives in the areas of environment, climate and energy. Last accessed 10/01/2018, at <http://www.government.se/articles/2016/09/summary-of-the-governments-budget-initiatives-in-the-areas-of-environment-climate-and-energy/>
- Tait, L. and M. Euston-Brown 2017: What role can African cities play in low-carbon development? A multilevel governance perspective of Ghana, Uganda and South Africa. *Journal of Energy in Southern Africa* 28 (3): 43–53.
- Tankha, S. and T. Rauken 2013: *Institutional Capacities for Climate Change Adaptation in India – A Pilot Study*. CICERO Report 2013:4. Oslo: CICERO.
- Tänzler, D., A. Cochu, R. Agster, B. Petrie, C. Reveco and B. Sadhukhan 2017: *Challenges and opportunities for urban climate finance – Lessons learned from eThekwin, Santiago de Chile and Chennai*. Berlin: adelphi.
- Teles, F. and P. Kettunen (2016): *Why Municipal Cooperation Matters: Diversity and Research Agendas*. In: U. Sadioglu and K. Dede (eds.), *Theoretical Foundations and Discussions on the Reformation Process in Local Governments*. Hershey, PA: IGI Global.

- Timperley, J. 2017: UN climate talks: Everything you need to know. Last accessed 21/12/2017, at <http://www.climatechangenews.com/2017/11/20/everything-you-need-to-know-about-fiji-in-bonn-un-climate-talks/>
- Tomàs, M. 2016: Metropolitan trends in the world. Metropolis Observatory, Issue Paper Vol. 1.
- Turmushabe, G., T. Muhumuza, E. Natamba, N. Bird, B. Welham and L. Jones 2013: Uganda National Climate Change Finance Analysis. London: Overseas Development Institute.
- Valente de Macedo, L., J. Setzer and F. Rei 2016: Transnational action fostering climate São Paulo and Beyond. *disP – The Planning Review* 52(2): 35–44.
- Viola, E. and K. Hochstetler 2015: Brazil. In: K. Bäckstrand and E. Lövbrand (Eds.), *Research Handbook on Climate Governance*. Cheltenham: Edward Elgar.
- Urban Earth n.d.: Local Government Climate Change Support Program. Last accessed 03/04/2018, at <http://www.letsrespondtoolkit.org/>
- UN DESA 2014: World Urbanization Prospects: The 2014 Revision. New York: United Nations.
- UNFCCC 2017: NAZCA: Tracking Climate Action. Last accessed 22/03/2018, at <http://climateaction.unfccc.int/>
- United Nations Development Programme 2010: Mainstreaming Climate Change in Colombia – Screening for risks and opportunity. Bogotá: UNDP.
- United Nations Human Settlements Programme (UN-Habitat) 2012: The Impact of Climate Change on Urban Settlements in Colombia. Nairobi: UN-Habitat.
- UN-Habitat 2016a: Finance for City Leaders Handbook. Nairobi: UN-Habitat.
- UN-Habitat 2016b: Addressing Climate Change in National Urban Policy. A Policy Guide for Low-Carbon and Climate-Resilient Urban Development. Policy Note No. 4. Nairobi: UN-Habitat.
- UN-Habitat 2016c: World Cities Report. Nairobi: UN-Habitat.
- UN-Habitat 2017: Sustainable Urbanization in the Paris Agreement. Nairobi: UN-Habitat.
- Vietnam Urban Forum 2018: Vietnam Urban Forum. Last accessed 03/04/2018, at <http://www.vuf.vn/?language=en>
- Watts, J. 2017: Alternative US group honouring Paris climate accord demands ‘seat at the table’. Last accessed 21/12/2017, at <https://www.theguardian.com/environment/2017/nov/11/alternative-us-group-honouring-paris-climate-accord-demands-seat-at-the-table-bonn>
- We Are Still In 2017: We Are Still In. Last accessed 21/12/2017, at <https://www.wearestillin.com/>
- Western Cape Government 2008: A Climate Change Strategy and Action Plan for the Western Cape.
- Western Cape Government 2014: Western Cape Climate Change Response Strategy. Cape Town: Western Cape Province Environmental Affairs and Development Planning. Last accessed 12/04/2018, at <https://www.westerncape.gov.za/eadp/climate-change-municipal-support-forum/key-climate-change-documents>
- Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU) 2016: Der Umzug der Menschheit: Die Transformative Kraft der Städte. Berlin: WBGU.
- Wolpe, P. and Reddy, Y. 2015: The contribution of low-carbon cities to South Africa’s greenhouse gas emission reduction goals – Briefing on urban energy use and greenhouse gas emissions. Cape Town: Sustainable Energy Africa.
- Wolpe, P.; Reddy, Y. and Euston-Brown, M. 2012: Energising urban South Africa: poverty, sustainability and future cities. Paper presented at “Towards Carnegie III” Conference held at the University of Cape Town from 3–7 September 2012.
- World Bank. 2010a: Climate finance in the urban context (English). Development, climate, and finance issues brief No. 4. Washington, DC: World Bank.

- World Bank 2010b: Green Cities: Cities and Climate Change in Brazil. Washington, DC: World Bank.
- World Bank 2016: World Bank Partners with State of California to Support Low Carbon Cities. Last accessed 03/04/2018, at <http://www.worldbank.org/en/news/press-release/2016/11/11/world-bank-partners-with-state-of-california-to-support-low-carbon-cities>
- World Bank 2016b: Urban population (% of total). World Bank Data Catalogue. Last accessed 16/01/2018, at <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS>
- WRI 2009: Sao Paulo Adopts Comprehensive Climate Change Policy. Washington, DC: WRI. Last accessed 10/01/2018, at <http://www.wri.org/blog/2009/08/sao-paulo-adopts-comprehensive-climate-change-policy>
- WRI 2017: This Interactive Chart Explains World's Top 10 Emitters, and How They've Changed. Last accessed 16/01/2018, at <http://www.wri.org/blog/2017/04/interactive-chart-explains-worlds-top-10-emitters-and-how-theyve-changed>
- WRI 2018: What is an INDC? Last accessed 26/03/2018, at <http://www.wri.org/indc-definition>
- Ziervogel, G., M. New, E. Archer van Garderen, G. Midgley, A. Taylor, R. Haman, S. Stuart-Hill, J. Myers, J and M. Walburton 2014: Climate change impacts and adaptation in South Africa. WIREs Climate Change 2014.
- Zimmermann, K. 2014: Democratic metropolitan governance: experiences in five German metropolitan regions. Urban Research & Practice. Vol. 7, Iss. 2, 2014.



Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn

Friedrich-Ebert-Allee 36 + 40
53113 Bonn, Germany
T +49 228 44 60-0
F +49 228 44 60-17 66

Dag-Hammarskjöld-Weg 1 - 5
65760 Eschborn, Germany
T +49 61 96 79-0
F +49 61 96 79-11 15

E info@giz.de
I www.giz.de