

CLIMATE FINANCE FOR CITIES AND BUILDINGS -A HANDBOOK FOR LOCAL GOVERNMENTS

UNITED NATIONS ENVIRONMENT PROGRAMME

## Acknowledgements

#### Supervision and coordination:

Arab Hoballah and Soraya Smaoun, UNEP

#### Lead authors:

Stéphane Pouffary, ENERGIES 2050 Heather Rogers, ENERGIES 2050

### Contributions and peer reviews:

We would like to thank the following for their valuable inputs: Jacob S. Halcomb (UNEP-SBCI); Claire Fayet (UNEP); Gajanana Hedge, Victoria Novikova, Niclas Svenningsen (UNFCCC); Curt Garrigan (UNEP-SBCI); Chang Deng-Beck (ICLEI); Philippine Waterkeyn (ENERGIES 2050).

We would also like to thank the following for their contributions to case studies: Rajat Gupta (Oxford Brookes University) - *Common Carbon Metric*, Kwi-Gon Kim (Urban Environmental Accords) - *Gwangju Approach* and *Carbon Banking System*; Hyun-Woo Lee (KEI) – *Urban CDM Toolkit*, Steve Thorne (SouthSouthNorth) – *Kuyasa energy upgrade project*, Lucy Price (ICLEI) – Bandeirantes landfill gas to energy and Tokyo cap-and-trade; Xing Zhang (UNFCCC) – Uganda Municipal Waste Compost Programme; Tobias Zeller, Anna Schissau (GIZ) and in-country partners - v-NAMAs in South Africa and Indonesia.

Cover photos: ENERGIES 2050 (front cover - Singapore; back cover - Cuenca, Ecuador).

**All other photos**: unless otherwise stated, photos have been provided by ENERGIES 2050. Graphics are either cited or free from copyright.

Design/Layout: Heather Rogers (ENERGIES 2050).

**Suggested citation**: UNEP (2014). *Climate Finance for Cities and Buildings - A Handbook for Local Governments*. UNEP Division of Technology, Industry and Economics (DTIE), Paris. Available at: <u>www.unep.org/publications</u>

Note: this document was prepared based on information available at May 2014.

Under the framework of a Memorandum of Understanding between Gwangju Metropolitan City and UNEP, this publication is prepared as part of a Research cooperation between Korea Environment Institute (KEI) and UNEP. The Research cooperation is financially supported by KEI and UNEP is an implementing partner.

#### Copyright © United Nations Environment Programme, 2014

This publication may be reproduced in whole or in part and in any form for educational or nonprofit purposes without special permission from the copyrightholder, provided acknowledgement of the source is made. UNEP would appreciate receiving a copy of any publication that uses this publication as a source.

No use of this publication may be made for resale or for any other commercial purpose whatsoever without prior permission in writing from the United Nations Environment Programme.

#### Disclaimer

The opinions, figures and estimates set forth in this publication are not the responsibility of the author, and should not necessarily be considered as reflecting the views or carrying the endorsement of the United Nations Environment Programme. While reasonable efforts have been made to ensure that the contents of this publication are factually correct and properly referenced, UNEP does not accept responsibility for the accuracy or completeness of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this publication. The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of UNEP concerning the legal status of any country, territory or city or its authorities, or concerning the delimitation of its frontiers or boundaries.

UNEP promotes environmentally sound practices globally and in its own activities. This publication is printed on 100% recycled paper, using vegetable-based inks and other eco-friendly practices. Our distribution policy aims to reduce UNEP's carbon footprint.

# Climate Finance for Cities and Buildings: A Handbook for Local Governments



## Contents

A	Acronyms and abbreviations4				
E	Executive Summary				
1	Intro	oduction – what, for whom and why?	8		
	1.1	What is this Handbook?	8		
	1.2	Who is it for?	8		
	1.3	Why cities and buildings?	9		
	1.4	What are climate and carbon finance?	9		
	1.5	Case studies in this Handbook	11		
2	Citie	es and buildings in the climate change context	13		
	2.1	The international context	13		
	2.2	Challenges	14		
	2.3	Opportunities	16		
	2.4	Tools and methodologies	19		
3	MRV	- what is it and why is it important?	22		
	3.1	What is MRV?	22		
	3.2	Why is MRV important for climate finance?	23		
	3.3	MRV for cities and buildings	24		
	3.4	Calculating a city GHG emissions inventory	26		
4	Clim	ate finance mechanisms	28		
	4.1	CDM large scale	34		
	4.2	CDM small scale and bundling	37		
	4.3	CDM Programme of Activities (PoA)	11		
	4.4	Citywide PoA	46		
	4.5	Nationally Appropriate Mitigation Actions (NAMAs)	50		
	4.6	The New Market-based Mechanism (NMM)	57		
5	Next	steps for urban climate finance	<b>30</b>		
Bi	Bibliography				

## **Case Studies**

Case Study 1 - Gwangju City Carbon Banking System – incentivising energy conservation in households	18
Case Study 2 - UNEP-SBCI's Common Carbon Metric – establishing GHG emissions baselines for buildings	19
Case Study 3 - The Francophonie's Initiative for Sustainable Cities - developing a systematic approach for implement sustainable urban strategies	ting 21
Case Study 4 – Developing climate finance in the building sector that meets MRV requirements	25
Case Study 5 - Developing a toolkit of urban CDM methodologies	32
Case Study 6 - Large scale CDM in the transport sector - TransMilenio bus rapid transit system, Bogotá, Colombia	36
Case Study 7 - Large scale CDM in the waste sector - Bandeirantes Landfill Gas to Energy Project, São Paulo	36
Case Study 8 - Combining several scale CDM methodologies – the Kuyasa low-cost urban housing energy upgrade project, South Africa	40
Case Study 9 - PoA in the waste sector: Uganda Municipal Waste Compost Programme	44
Case Study 10 - PoAs for solar water heating – experience from Tunisia and South Africa	45
Case Study 11 - Mexico's Sustainable Housing Project - Combining CDM methodologies in a nationwide PoA	48
Case Study 12 – The Gwangju Low Carbon Green City Approach	49
Case Study 13 - Tunisia's NAMA for energy efficiency measures in the building sector	54
Case Study 14 - Engaging sub-national government in NAMA design, in Indonesia and South Africa	55
Case Study 15 - A city scale cap-and trade emissions programme to drive energy efficiency in buildings, Tokyo	59



Myanmar. Photo: ENERGIES 2050

## Figures

Figure 2.1 GHG emissions source profiles for selected cities by key sectors	14
Figure 2.2 Typical emissions sources in cities including those that flow in and out of a city's boundaries	16
Figure 4.1 Moving from individual CDM projects using a single technology through to multi-sector, multi-technology mitigation initiatives at the national or citywide scale	30
Figure 4.2 CDM projects and programmes registered so far around the world	31
Figure 4.3 The CDM project cycle	33
Figure 4.4 A PoA is structured as an overarching 'umbrella' programme for CPAs and their sub-projects	41
Figure 4.5 Generic PoA organisational structure, including the role of the CME	42
Figure 4.6 Steps in setting up a PoA and CPAs, and the points at which sampling is relevant for MRV	43
Figure 4.7 The 'citywide' PoA concept could take two forms: single city, multi sector vs. multi city, single sector	46
Figure 4.8 Example of the structure for a citywide PoA	47
Figure 4.9 Potential components of a NAMA	50
Figure 4.10 Desired impacts to consider for a NAMA - for GHG mitigation and sustainable development.	51
Figure 4.11 The broad types of NAMAs	51

## Tables

Table 1-1 Overview of case studies presented in this Handbook	11
Table 3-1 Selected publications providing advice on MRV both generally and for specific types of climate finance	23
Table 4-1 Climate finance mechanisms described in this Handbook	28
Table 4-2 Differences between carbon finance mechanisms and climate finance mechanisms.	29
Table 4-3 Recently approved small scale CDM methodologies within the buildings and transport sectors	38
Table 4-4 Examples of PoAs registered in cities and buildings	44
Table 4-5 Actions for overcoming barriers to involving sub-national governments in NAMA design and delivery	52



Rabat tramway, Morocco. Photo: ENERGIES 2050

# Acronyms and abbreviations

CDM	Clean Development Mechanism
CER	Certified Emission Reduction (also known as 'carbon credits')
COP	Conference of the Parties (to the UNFCCC)
СРА	Component Project Activity
DNA	Designated National Authority
DOE	Designated Operational Entity
GHG	Greenhouse gas
GI-REC	Global Initiative for Resource Efficient Cities (UNEP GI-REC)
MRV	Measurement, Reporting and Verification
NAMA	Nationally Appropriate Mitigation Actions
NMM	New Market-based Mechanism
PDD	Project Design Document
PoA	Programme of Activities
SBCI	Sustainable Buildings and Climate Initiative (UNEP - SBCI)
tCO <sub>2</sub> e	Tonne of carbon dioxide equivalent
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

# **Executive Summary**

The importance of cities in climate policy refers to the simple reality that they house the majority of the world's population and associated human activities, and that they account for approximately two-thirds of global energy use and **over 75% of energy-related greenhouse gas (GHG) emissions**. This is also true for the buildings sector, which generates up to 30% of all energy-related GHGs. At the same time, cities as well as buildings have a unique and significant emission reduction potential but, in both cases, they often lack the knowledge and financial resources necessary to act.

In the international arena, **climate finance** has become an important means to support GHG emissions mitigation projects and programmes. This being said, existing mechanisms do not specifically target local authorities, cities or building stakeholders and as a result there is a great disparity between the low proportion of climate finance projects and programmes focused on cities and buildings, compared to their GHG mitigation potential.

There is a need to adapt existing and developing mechanisms to suit the complex built **environment** and urban context, whilst building capacity to facilitate the inclusion of climate finance as a means to supporting cities' climate change strategies.

To support this, guidance is needed to help local policy makers and city managers navigate through the key climate finance mechanisms and to understand their relevance to cities and buildings, as part of wider GHG mitigation strategies and a means to access finance to support these.

In response, this Handbook has been prepared to provide local governments and other interested parties with an overview of climate finance mechanisms, both existing and in development, and their relevance to the built environment and the urban context.

The objectives of this Handbook are to help raise awareness among local stakeholders regarding climate finance and its potential in the built environment, given the important role that this sector has to play in climate change mitigation. It also aims to help local governments to use climate finance mechanisms as an opportunity to increase the energy performance of their district whilst creating additional revenue, improve resource efficiency and support their wider climate strategies.

# 预览已结束, 完整报告链接和二维码如下:



https://www.yunbaogao.cn/report/index/report?reportId=5 16222