



A PRACTICAL FRAMEWORK FOR PLANNING PRO-DEVELOPMENT CLIMATE POLICY

Copyright © United Nations Environment Programme, 2011.
This publication may be reproduced in whole or in part and in any form for educational or non-profit purposes without special permission from the copyright holder, 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 designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the United Nations Environment Programme concerning the legal status of any country, territory, city or area or of its authorities, or concerning delimitation of its frontiers or boundaries. Moreover, the views expressed do not necessarily represent the decision or the stated policy of the United Nations Environment Programme, nor does citing of trade names or commercial processes constitute endorsement.

MCA4climate Foreword by UNEP

Climate is an inordinate challenge but also an inordinate opportunity to transform economies onto a low-carbon, resource-efficient Green Economy path.

Catalyzing clean energy will not only cut greenhouse-gas emissions as part of efforts to limit a global temperature rise to under 2 degrees C or more, it also represents a way of curbing health-hazardous air pollution while offering a rapid path to address energy poverty, especially in rural areas of developing economies.

Meanwhile enhancing ecosystems such as forests, mangroves and seagrasses in order to conserve their carbon stocks can also trigger multiple benefits from boosting water supplies and improving agriculture to maintaining natural sea defences and nurseries for fish. The 17th Conference of the Parties meeting in Durban, South Africa, later this year presents the world with another opportunity to advance the climate agenda and co-operative action under the UN Climate Convention.

It is crucial that those actions are designed within a coherent and robust policy-planning framework to ensure that they are both cost-effective and compatible with broader social, economic and environmental goals. For developing countries, sound climate-policy planning will also enhance access to climate finance from the developed ones.

Climate-policy planning is a complex undertaking. Many developing countries are only just starting to consider how to go about it and some require improved access to the requisite knowledge, expertise and technical skills. Drawing upon best practices, tried and tested in other parts of the world, is clearly an advantage. The MCA4climate, a new UNEP initiative, is designed to assist policymakers, particularly in the developing world, in that endeavour. It offers concrete guidance and recommendations on a number of critical issues and proposes a formal framework for evaluating climate mitigation and adaptation policies, paving a practical way forward so that countries evolve sustainably and grow their economies in a way that keeps humanity's footprint within planetary boundaries. It draws on the work of leading experts on climate policymaking from around the world and uses an innovative approach to assessing policies that ensures that climate policies and strategies take full account of developmental concerns and objectives.

The MCA4climate initiative reflects UNEP's mission to provide leadership and encourage partnership in caring for the environment by inspiring, informing and enabling nations and peoples to improve their quality of life without compromising that of future generations—issues at the centre of Rio+20 next year in Brazil as governments look to scale-up and accelerate the implementation of the agreements, including those relating to climate change, established in Rio in 1992.



Achim Steiner,
UN Under-Secretary General and Executive Director
United Nations Environment Programme (UNEP)

Contributors



At the UN Climate Change Conference in Cancun in December 2010, the countries of the world laid the foundation for the most far-reaching collective effort the world has ever seen to reduce carbon emissions, and to build a system which makes all countries accountable to one another for those emission reductions.

Under the Cancun Agreements, all industrialized nations made official their reduction pledges, and committed themselves to develop low-carbon development plans or strategies. Developing countries made official their nationally appropriate mitigation actions (NAMAs) which seek a deviation from business-as-usual emissions by 2020, and were encouraged to develop low-carbon growth strategies.

In addition, the Cancun Agreements provide the strongest signal countries have ever given to the private sector that we are moving toward low-carbon economies, by committing to a maximum temperature rise of 2 degrees Celsius, and a consideration of a maximum of 1.5 degrees in the near future.

It is clear that the poorer developing countries will need substantial financial and technical support in preparing and implementing mitigation and adaptation actions. The agreements in Cancun on mobilizing finance for developing countries, including the establishment of a Green Climate Fund and a registry to match action with funding and other types of support, constitute major steps forward. So do the agreements on a new Technology Mechanism and Adaptation Committee.

All countries accept the need for collective action on climate change. But national responses to it will need to vary according to each country's circumstances and potential. It is the job of governments to set laws and regulations to drive changes in business and public behaviour that mitigate greenhouse gas emissions and enhance our capacity to adapt to climate change.

For the developing countries, climate plans will need to be compatible with and supportive of their development goals. If developing countries are convinced that there are major development benefits to be drawn from climate action, such as faster long-term growth, better employment prospects and reduced poverty, they will be much more likely to embark on policies to put them on a low-carbon development path.

That is why UNEP's MCA4climate initiative, which provides valuable guidance to policy makers on drawing up and improving their climate plans taking account of the full range of socio-economic and environmental concerns, can prove highly effective in stimulating cost-effective national actions.

I wish this initiative every success.



Christiana Figueres,
Executive Secretary, United Nations Framework Convention
on Climate Change (UNFCCC)

UNEP is the convener of the MCA4climate initiative, which was launched at the end of 2009 with financial support from the [Government of Spain](#). Our role is to bring together leading experts from around the world, to co-ordinate their analysis, to manage the consultation process and to ensure the legitimacy of their formal submissions. The UNEP team, part of the Division of Technology, Industry and Economics based in Paris and working on MCA4climate comprises:

- › [Şerban Scriciu](#): project management, climate economics and policy evaluation framework.
- › [Sophy Bristow](#): multi-criteria decision support tool, case studies and outreach.
- › [Daniel Puig](#): programme management.

UNEP also acknowledges the assistance of [Trevor Morgan](#) in preparing this report.

Main partners

Several acclaimed international experts have contributed towards the development of the MCA4climate initiative and on different parts of the guidance package. Some have helped us define our approach and develop guidance documents, while others have applied the generic methodology to a specific mitigation or adaptation theme. Our main partners are listed below in alphabetical order:

- › [Frank Ackerman](#) (Stockholm Environment Institute US): guidance on climate-change economics and critical issues for climate-policy analysis.
- › [Valerie Belton](#) (University of Strathclyde): guidance on multi-criteria decision analysis and methodology development.
- › [Kornelis Blok](#) (Ecofys): mitigation theme guidance on improving energy efficiency and saving energy.
- › [Ariane de Bremond](#) (University of Maryland): adaptation theme guidance on increasing terrestrial ecosystems resilience.
- › [Zaid Chalabi](#) (London School of Hygiene and Tropical Medicine): methodology development and adaptation theme guidance on reducing human health impacts and risks.
- › [William Cheung](#) (University of East Anglia): adaptation theme guidance on increasing marine ecosystems resilience.
- › [Heleen de Coninck](#) (Energy Research Centre of the Netherlands): mitigation theme guidance on capturing and storing emissions of CO₂.
- › [William Easterling](#) (Penn State University): mitigation theme guidance on improving land use management.

- › [Paul Ekins](#) (University College London): guidance on interactions between climate change and fiscal sustainability.
- › [Nathan Engle](#) (Battelle — Pacific Northwest National Laboratory / Joint Global Change Research Institute): adaptation theme guidance on increasing terrestrial ecosystems resilience.
- › [Günther Fischer](#) (International Institute for Applied Systems Analysis): adaptation theme guidance on reducing agricultural output losses.
- › [Stéphane Hallegatte](#) (Centre International de Recherche sur l'Environnement et le Développement): adaptation theme guidance on increasing infrastructure resilience.
- › [Sari Kovats](#) (London School of Hygiene and Tropical Medicine): adaptation theme guidance on reducing human health impacts and risks.
- › [Reinhard Mechler](#) (International Institute for Applied Systems Analysis): adaptation theme guidance on reducing extreme weather event impacts.
- › [Kathleen Miller](#) (National Center for Atmospheric Research, Colorado): adaptation theme guidance on improving water resources management.
- › [William Moomaw](#) (Tufts University): mitigation theme guidance on increasing the share of low-carbon energy sources in the fuel mix.
- › [Trevor Morgan](#) (Menecon Consulting): guidance on measurement, reporting and evaluation.
- › [Robert Nicholls](#) (University of Southampton): adaptation theme guidance on improving coastal zone management.
- › [Stefan Speck](#) (European Environment Agency): guidance on interactions between climate change and fiscal sustainability.
- › [Elizabeth A. Stanton](#) (Stockholm Environment Institute US): guidance on developing baselines.
- › [Rashid Sumaila](#) (University of British Columbia): adaptation theme guidance on increasing marine ecosystems resilience.
- › [Erika de Visser](#) (Ecofys): mitigation theme guidance on improving energy efficiency and saving energy.

Other contributing experts

We would also like to acknowledge the contribution of other experts who have been involved in different stages of the MCA4climate initiative. These include: [Robert Wilby](#) (Loughborough University) and [Bekele Debele Negewo](#) (World Bank) on the Sana'a Basin, Yemen adaptation case study; [Glynn Morris](#) (AGAMA Energy) on the South African mitigation case study; [Benjamin Jones](#) (formerly with the IMF) on providing guidance on the linkages with fiscal policy; [Jan Corfee-Morlot](#)

(Organisation for Economic Co-operation and Development) and [K. Narayanan](#) (Indian Institute of Technology Bombay) on the Mumbai, India adaptation case study; and [Thanakvaro Thyl De Lopez](#) and [Anne Olhoff](#) (UNEP Risø Centre on Energy, Climate and Sustainable Development) on helping define the themes and objectives of the project.

Steering committee

We are grateful to the following, who have acted as a Steering Committee, particularly in the earlier stages of the MCA4climate initiative: [Preeti Bhandari](#) (UNFCCC); [Rémy Paris](#) (OECD); [Alicia Montalvo Santamaria](#) and [Ana Pintó Fernández](#) (Spanish Climate Change Office, Ministry of Environment, and Rural and Marine Affairs); [Juan C. Mata Sandoval](#) (Ministry of Environment and Natural Resources of Mexico); [Colin Kirkpatrick](#) and [Clive George](#) (University of Manchester); and [Mark Kenber](#) (The Climate Group).

External reviewers

We would also like to thank our external reviewers of the several documents issued under the MCA4climate initiative: [Ian Parry](#) (International Monetary Fund); [Anthony Janetos](#) and [Elizabeth Malone](#) (Joint Global Change Research Institute - Pacific Northwest National Laboratory / University of Maryland); [Susanne Akerfeldt](#) (Ministry of Finance of Sweden); [Terry Barker](#) (University of Cambridge); [Stephen DeCanio](#) (University of California, Santa Barbara); [Ellina Levina](#) (International Energy Agency); [Brendan Beck](#) (South Africa's National Energy Research Institute / IEA); [Raghu Murtugudde](#) (University of Maryland); [Chu Thai Hoanh](#) (International Water Management Institute, Laos); [Bob Scholes](#) (Council for Scientific and Industrial Research in South Africa); [Jared Bosire](#) (Kenyan Marine and Fisheries Research Institute); [Sumana Bhattacharya](#) (Windrock International India, New Delhi); [Mala Rao](#) (Indian Institute of Public Health, Hyderabad); [Carlos Corvalan](#) (The Pan American Health Organisation / WHO); [Shri P.G. Dhar Chakrabarti](#) (National Institute of Disaster Management, Ministry of Home Affairs, Government of India); [Hilary McMahan](#) (United Nations Development Programme); [Roger Street](#) and [Patrick Pringle](#) (UK Climate Impacts Programme); [Heather McGray](#) and [Margaret Steadman](#) (World Resources Institute); [Jane Ellis](#) (Organisation for Economic Co-operation and Development); [Ana Pintó](#) and [Sara Aagesen](#) (Spanish Climate Change Office); and [Noriko Yamada](#) (UNEP).

This report draws on inputs from all main partners and experts mentioned above. We fully and gratefully acknowledge the Government of Spain for financially supporting the MCA4climate initiative and providing helpful reviews through its Spanish Climate Change Office.

3	Foreword by UNEP
4	Foreword by UNFCCC
5	Acknowledgements
10	1 Introduction
12	Background and rationale
12	Objectives and scope of the MCA4climate initiative
15	Purpose and structure of this report
18	2 Policy options for mitigation and adaptation
20	Developing a climate-change policy plan
22	Mitigation policy options
28	Adaptation policy options
44	3 MCA4climate policy evaluation framework
46	Multi-criteria analysis and its rationale
48	Applying the MCA4climate policy evaluation framework
64	4 Case studies
68	Mumbai
78	Sana'a Basin, Yemen
92	South Africa
101	Lessons learned
102	5 Guiding principles for climate-policy planning
104	Economic analysis of climate-policy options
112	Developing baseline projections
119	Dealing with risk and uncertainty
122	Evaluating fiscal implications
128	Measurement, reporting and verification
134	Annex A: References
138	Annex B: International sources of data and projections
142	Annex C: About the UNEP Division of Technology, Industry and Economics

MCA4climate is a major new UNEP initiative providing practical assistance to governments in preparing their climate change mitigation and adaptation plans and strategies. It aims to help governments, particularly in developing countries, identify policies and measures that are low cost, environmentally effective and consistent with national development goals. It does this by providing a structured approach to assessing and prioritizing climate-policy options, while taking into consideration associated social, economic, environmental and institutional costs and benefits. In doing so, it seeks to counter the widely held perception that tackling climate change is costly, highlight the potential developmental benefits of addressing climate change and encourage action to that end.

1 Introduction

Background and rationale

At the climate talks in Cancún in December 2010, the long-term goal of limiting global warming to below 2 degrees Celsius in comparison with pre-industrial levels and Annex I and non-Annex I pledges of greenhouse gas emission reduction targets were formally incorporated into the UN Framework Convention on Climate Change. The Cancún Agreements further encourage non-Annex I parties — mainly developing countries — to develop low-carbon strategies and require them to take national appropriate mitigation actions (NAMAs) in the context of sustainable development aimed at achieving a deviation in emissions relative to business-as-usual emissions in 2020. They also take on board a commitment made by developed countries at the Copenhagen meeting a year earlier to provide \$30 billion in fast-start finance in 2010-2012 for developing country NAMAs and national adaptation plans and actions (NAPAs), and to mobilize \$100 billion a year of public and private finance by 2020.

In addition, the Agreements establish a Green Climate Fund to manage a portion of this funding. Many developing countries are still at an early stage of developing formal climate change policy plans, identifying specific mitigation and adaptation policy options, and deciding on which ones to adopt. There is widespread and increasing willingness to take this process forward and to take advantage of the funding that is on offer. But, in many cases, the planning process is complicated by the sheer complexity of the linkages and trade-offs between climate-related policy goals and broader developmental policy goals, as well as a lack of communication about the range of policy options available and how to go about evaluating their effects. Developing countries can often benefit from assistance in devising sound, low-cost and pro-development climate action plans.

Objectives and scope of the MCA4climate initiative

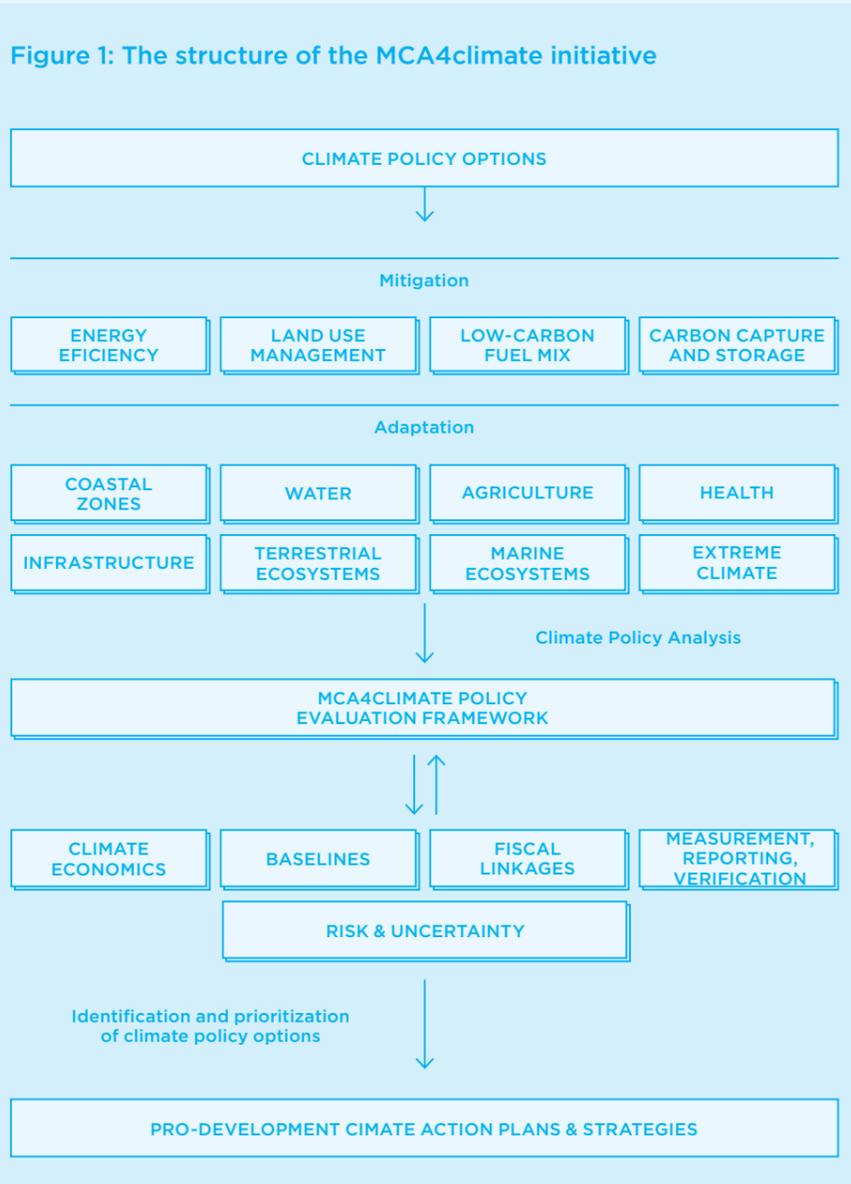
The MCA4climate initiative is intended to help meet this need, by providing practical help and guidance to governments, especially in developing countries, in formulating their climate-policy plans in the context of broader economic and social policymaking. It hopes to support current and future work on assessing how investment in low-carbon and climate resilient technologies could lead to job creation, growth, improved health prospects and other development benefits. Specifically, it enables governments to:

- › Identify the developmental benefits of climate mitigation and adaptation in order to strengthen the case for such action and better integrate climate policy into national-level development-policy planning.

- › Assess systematically the complex linkages and trade-offs between the multi-faceted dimensions of climate change and its policy responses.
- › Prioritize investments related to curbing greenhouse-gas emissions or adapting to climate change when deciding on the allocation of limited finance across a large array of possible climate actions.
- › Deal with different or conflicting interests and objectives.

The principal way in which MCA4climate seeks to provide this assistance is through the application of the MCA4climate policy evaluation framework — a powerful analytical tool that has been developed specifically for the MCA4climate initiative by UNEP with assistance from a number of leading international experts. This framework, as the name indicates, is based on a multi-criteria analysis (MCA) approach — a well-established technique for aiding decision-making that has already been successfully deployed in non-climate areas of policymaking. The MCA4climate policy evaluation framework is intended to be used as a practical step-by-step tool for identifying and prioritizing mitigation and adaptation policies, consistent with developmental goals. It ensures that all the different dimensions of climate policies, including those that cannot be easily measured in monetary terms, are taken into consideration. It also facilitates the engagement of stakeholders in the policy-planning process.

At the heart of this framework is a hierarchical criteria tree containing a set of generic criteria, against which climate-policy planners can evaluate proposed policy actions and their potential contribution to a broad range of developmental objectives. Those policy actions have been categorized into 12 areas, or themes — four covering mitigation and eight covering adaptation — to provide a comprehensive guide to the various policy options available. For each theme, detailed criteria and indicators have been developed to enable the multi-dimensional effects of each policy to be evaluated. Recommendations have also been drawn up on appropriate forms of assessment and data sources. The potential interactions across the various themes have also been identified. In order to test the MCA4climate policy evaluation framework and demonstrate that it works, we applied the framework in three separate casestudies: two on adaptation (flood risks and infrastructure resilience in Mumbai, India and water management in the Sana'a Basin in Yemen) and one on mitigation (moving the electricity sector in South Africa towards low-carbon sources). Applying the MCA4climate policy evaluation framework — or, indeed, any approach to formulating climate policy — is confronted by a number of practical issues. We have analyzed in depth some of the most critical issues and prepared some guiding principles and practical recommendations on how to address them. These issues include assessing the economic implications of the



various policy options, dealing with risk and uncertainty, developing and using baselines, understanding the fiscal implications of climate policies and undertaking the measurement, reporting and verification of policy actions and their effects. This guidance is intended to be of practical value to government officials directly involved in applying this framework or in analyzing climate policies more generally, as well as to

Purpose and structure of this report

This report is intended to provide a formal record of the results of the MCA4climate initiative to date. It contains four substantive sections, the findings of which can be used independently to address specific issues or as a whole to conduct a comprehensive evaluation of climate policy plans (Figure 1). The sections are as follows:

- › Climate policy options: an overview of the nature of the policy challenge posed by climate change and of the policy-planning process, and a full description of the range of climate mitigation and adaptation policy options available categorized according to the 12 themes.
- › The MCA4climate policy evaluation framework: a description of the climate policy evaluation framework, how it works and how it can be applied in practice across the themes. This includes the MCA4climate criteria tree which is a practical tool for evaluating the multiple dimensions of climate policies.
- › Case studies: an exploration of the practicalities of applying the MCA4climate framework to real policy problems in three different locations. Each case study was designed to test different elements of the framework, and the lessons learnt contributed to the development of the overall MCA4climate initiative.
- › Guiding principles for climate-policy planning: a summary on cross-cutting aspects of climate-policy planning and analysis, including practical recommendations.

Further information on the MCA4climate policy evaluation framework and approach, all of the detailed reports on each of the themes (theme reports), the guidance on critical aspects of climate-policy planning (also labelled as guiding principles) and the case studies, together with more information about the background to the MCA4climate initiative, can be downloaded from the MCA4climate website: www.mca4climate.info.

Next steps

It is hoped that this report will encourage policymakers in developing countries and other stakeholders to consult and make use of the theme reports and guidance documents and to consider the possibility of applying the MCA4climate policy evaluation framework at the national level. It is envisaged that applying the framework fully will require the direct involvement of external experts who have been engaged in the initiative or are familiar with using this framework. The next steps that UNEP envisages in taking the MCA4climate initiative forward are:

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_9289

