



**Bangkok**  
Assessment Report  
on Climate Change **2009**

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### GLF

The Green Leaf Foundation was officially founded and registered on 17 March 1998. It was jointly established by organizations with the same determination and responsibility, with support, funding and sponsorship from various local and international organizations. GLF has organized several training seminars on environmental education, environmental standards and energy efficiency since 1999. Its main objective is to promote knowledge and to support studies and research for creating good understanding of environmental conservation.

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### BMA

The Bangkok Metropolitan Administration (BMA) is organized in accordance with the Bangkok Metropolitan Administration Act 1985 to be responsible for the management of the city of Bangkok. It is the sole organization at the local authority level responsible for its duties and it provides services for the well-being of Bangkok residents.

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## FOREWORD

Climate change is a global issue which is of concern to the entire international community. In view of the rapid increases in urbanization that have occurred in countries of Asia, including Thailand, over the past several decades, the impacts of climate change are starting to occur and are expected to be especially serious in the not too distant future. Thus, they are worthy of increased study and vigorous remedial action.

The main cause of this critical problem is the emission of greenhouse gases; unfortunately Bangkok plays a role in this regard. As the capital of Thailand, Bangkok has reached mega-city status. It annually releases tremendous amounts of greenhouse gases into the atmosphere, thus contributing to the acceleration of global warming and the other deleterious impacts that will be the outcome of that warming, such as flooding, higher temperatures and disease outbreaks.

The Bangkok Metropolitan Administration (BMA) recognizes that it has a responsibility to try to reduce the climate change problems threatening the living conditions of the people of Bangkok. Therefore, BMA in cooperation with UNEP has published this Bangkok Assessment Report on Climate Change 2008 to increase the knowledge and understanding of climate change globally, nationally and locally. This report also focuses on the mitigation and adaptation measures that must be implemented by BMA and all the other sectors concerned.

The reduction of greenhouse gas emissions will require cooperation from every sector. In addition to the initiatives of BMA, the general public must play an essential role in solving the problem, since several of the efforts to reduce greenhouse gas emissions depend on public cooperation, with several of them being totally reliant on the awareness of the people of Bangkok and their wholehearted participation. While the people make adjustments in their daily activities or lifestyle, BMA will provide them with the knowledge and support they need so that these improvements can be realized as efficiently and painlessly as possible.

We strongly believe that the cooperation of every responsible sector in society is required in order to reduce the impacts of climate change. Our communal action in combating climate change and making adjustments in the way we live will bring about benefits not only now but also to future generations of people at home and abroad.

BMA is serious about climate change mitigation and adaptation actions. We are committed to helping to foster sustainable urban environmental management. Our ultimate goal is to improve the environment, human health and the quality of life of those living in Bangkok, while contributing to making the world a better place to live.

**Dr. Pongsak Semson**  
Permanent Secretary for Bangkok Metropolitan Administration



## FOREWORD

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The United Nations Environment Programme (UNEP) is mandated to regularly assess major environmental developments and trends. This mandate is implemented through the Global Environment Outlook (GEO) process, which involves global, regional, subregional, national and city-level assessments.

The GEO process is participatory and consultative, with capacity-building at its core. The result is scientifically authoritative information for environmental management and policy development tailored to a wide target audience.

The Bangkok Assessment Report on Climate Change 2009 is one of the outputs of this capacity-building programme, and the first UNEP endeavour conducted in partnership with a city authority to assess climate change impacts, to support decision makers in understanding the need for urgent action and to mobilize public awareness and participation.

Built on a swampy floodplain along the Chao Phraya River near the Gulf of Thailand, Bangkok is home to more than 10 million people. The Bangkok Assessment Report on Climate Change 2009 reveals that the city is already experiencing the impacts of climate change. Bangkok and its suburbs are experiencing more severe and frequent flooding as well as an increase in the number of days hotter than 35°C. This may have serious implications for the country's economy, including its tourism industry.

The report also points out that 87 per cent of Bangkok's annual greenhouse gas emissions come from the electricity, transportation, waste and wastewater sectors. In this context, I congratulate the Bangkok Metropolitan Authority for being proactive in taking actions to reduce its greenhouse gas emissions by at least 15 per cent by 2012 in comparison with projections under a "business-as-usual" scenario.

However, for Bangkok and cities like it, adaptation to climate change remains the most urgent priority. The Bangkok Assessment Report on Climate Change 2009 sets out a number of adaptation options for climate-proofing the city. These include improving the local public health infrastructure and disease surveillance and prevention programmes; creating early warning systems for extreme weather events; and implementing stricter zoning and building codes to minimize damage from storms and sea level rise.

The Medium-term Strategy (2010-2013) of UNEP directs the organization to strengthen the ability of countries to integrate climate change responses into their national development processes that are supported by scientific information, integrated climate impact assessment and local climate data. I believe this report fulfils this mandate and provides the necessary information and options for BMA to sustain the quality of life and livelihoods of the city's residents.

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A handwritten signature in black ink, reading 'Achim Steiner'.

Achim Steiner

United Nations Under-Secretary-General and Executive Director  
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# Executive Summary

Thailand has long been actively participating in the global efforts to prevent or at least ameliorate the effects of climate change. Now its capital city, Bangkok, is starting to participate in these efforts since it is a significant source of greenhouse gases emitted into the atmosphere, and as the nation's economic hub it has a lot to lose.

This report attempts to explain why and how climate change is affecting Bangkok, while giving some idea of the likely trends that may be expected and what action will have to be taken in order to make the predicted outcomes less severe.

Bangkok contains close to 15 per cent of the entire population of Thailand, or close to 10 million people in real terms. Thailand's capital, communications hub, and administrative and business centre produced emissions of carbon dioxide totalling 43 million tons in 2005—a much greater volume than that of Toronto (24 million tons). Although they were lower than the total carbon dioxide emissions of New York City (58 million tons), they were about the same as those of London (44 million tons). Those data are enough to put Bangkok in the ranks of major sources of greenhouse gas emissions. In per capita terms, Bangkok was responsible for producing 7.1 tons of carbon dioxide per annum in 2007, that is, the same level of emissions as produced by New Yorkers (7.1 tons per capita), and considerably higher than the annual emissions of Londoners (5.9 tons per capita) but lower than the levels produced by residents of Toronto (9.6 tons per capita).

In 2007, the principal sources of greenhouse gas emissions in Bangkok were transportation (37.68 per cent) and electricity generation (33.37 per cent) (see table 3.2). The Department of Energy Business, Ministry of Energy, indicated that the transport sector in Bangkok emitted almost 23.07 million tons of carbon dioxide per annum from consuming 8,948,683 million litres of gasoline and diesel oil. Electricity used was as high

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