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## Benchmarking Urban Air Quality Management and Practice in Major and Mega Cities of Asia

### Stage I





**APMA**

**Benchmarking Urban Air Quality  
Management and Practice  
in Major and Mega Cities of Asia  
Stage 1**





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**Benchmarking Urban Air Quality Management  
and Practice in  
Major and Mega Cities of Asia**

**Stage I**

Prepared and published in the  
framework of the APMA Project

by

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# Foreword

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Urban air quality is becoming increasingly recognised as a major public health problem and environmental issue in the Asian region. Increased economic development has led to rapid and unplanned urbanisation with a large number of people being concentrated in cities. In the year 2000, 37 per cent of the population in Asia lived in urban areas. This number is expected to increase to 54 per cent by 2030.

Clean air is essential for sustainable development and effective urban air quality management strategies will be crucial in securing the future well-being of large numbers of residents in major and mega cities throughout Asia. A lack of information exchange on effective urban air quality management together with unsynchronised urban air quality management policies in the region has contributed to the absence of regional cooperation on urban air quality issues.

The United Nations Environment Programme (UNEP) supported by the World Health Organization (WHO), recognizing the severity of air pollution caused by rising motor vehicle use and industrial expansion in Asia, initiated the Air Pollution in the Megacities of Asia (APMA) project in November 2000 in collaboration with Korea Environment Institute (KEI) and the Stockholm Environment Institute (SEI). The project is funded by the Ministry of the Environment – Korea (MoE) and the Swedish International Development Cooperation Agency (Sida) as part of its Regional Air Pollution in Developing Countries (RAPIDC) Programme.

The aim of APMA is to provide a foundation for information exchange and regional cooperation on air quality issues. This report presents Stage I of a benchmarking exercise to systematically assess current urban air quality management and practice in selected major and mega cities of Asia and to review practice in cities in Europe and North America. By learning from good practice and understanding the processes by which they are achieved, cities in Asia can develop appropriate and effective air quality management strategies which will ultimately reduce the health and environment impacts of urban air pollution.

The report represents work in progress and is based on available data and information received from national governments and city authorities in the region. The authors welcome comments, additional data and information on air quality management for the cities covered in the benchmarking exercise.

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# Introduction

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Urban air pollution poses a significant threat to human health and environment and the quality of life of millions of people throughout the world. Approximately 1,200 million people globally are exposed to excessive levels of sulphur dioxide and approximately 1,400 million globally are exposed to excessive levels of smoke and particulate matter (PM). Recent estimates of the increase in daily mortality show that on a global scale 4–8 per cent of premature deaths are due to exposure to PM in outdoor and indoor environment, with potentially 500,000 excess deaths annually due to PM in outdoor situations (Schwela and Gopalan, 2002). The World Summit on Sustainable Development (WSSD) recognised the problem of air pollution in Section IV 37 of its Plan of Implementation (2002) which requests States to:

*“Enhance cooperation at the international, regional and national levels to reduce air pollution, including transboundary air pollution, acid deposition and ozone depletion bearing in mind the Rio principles, including, inter alia, the principle that, in view of the different contributions to global environmental degradation, States have common but differentiated responsibilities, with actions at all levels to:*

*(a) Strengthen capacities of developing countries and countries with economies in transition to measure, reduce and assess the impacts of air pollution, including health impacts, and provide financial and technical support for these activities ” (WSSD, 2002).*

The Plan acknowledges the significant impact of air pollution on human health in Section VI on Health and Sustainable Development which states:

*“49. Reduce respiratory diseases and other health impacts resulting from air pollution, with particular attention to women and children, by:*

*(a) Strengthening regional and national*

*programmes, including through public-private partnerships, with technical and financial assistance to developing countries;*

*(b) Supporting the phasing out of lead in gasoline;*

*(c) Strengthening and supporting efforts for the reduction of emissions, through the use of cleaner fuels and modern pollution control techniques;*

*(d) Assisting developing countries in providing affordable energy to rural communities, particularly to reduce dependence on traditional fuel sources for cooking and heating, which affect the health of women and children.*

*50. Phase out lead in lead-based paints and other sources of human exposure, work to prevent, in particular, children’s exposure to lead, and strengthen monitoring and surveillance efforts and the treatment of lead poisoning” (WSSD, 2002).*

Cities in both developed and developing countries are now having to implement air quality management strategies to address the deterioration in urban air quality associated with high levels of population growth, urbanisation, industrial activity and motor vehicle use. However, there is no universal air quality management strategy that could be applied to all cities throughout the world. Each urban area is unique in terms of its air pollution problems, spatial and temporal patterns of emission sources and cultural, economic, physical and social characteristics.

In Asia air pollution is expected to increase considerably over the next three decades due to rising levels of economic growth and energy consumption especially in urban areas (UNEP, 2002). Learning from the successes and difficulties encountered in attempts to implement urban air quality management strategies

in other countries throughout the world can assist in the formulation, evaluation, implementation and modification of the most appropriate strategies and combination of measures for major and mega cities in the Asian Region.

This study is a first attempt at undertaking a systematic assessment of the current status of urban air quality management and practice in Asian cities. It is hoped that it will provide a benchmark from which future initiatives and progress in Asia can be assessed and allow the exchange of lessons learnt in dealing with urban air pollution issues in different countries.

## 1.1 Study Aims and Objectives

This study on *Benchmarking Urban Air Quality Management in Major and Mega Cities of Asia* is undertaken in the framework of the Air Pollution in the Megacities of Asia (APMA). The overall objective of the APMA project is to contribute to the improvement of urban air quality in major and mega cities in Asia by establishing a network to provide information on UAQM, technical support and training and to facilitate the adoption of regional and local UAQM action plans.

The aims of the Benchmarking exercise are to:

- provide an assessment of current urban air quality management and practice in a selected number of Asian Cities;
- review UAQM in European and North American cities;
- make conclusions and recommendations based on experience of UAQM in cities in Asia, Europe and North America in order to disseminate best practice and to improve urban air quality in Asian cities and support a Strategic Framework on Common Action for Urban Air Quality Management in the Asian Region.

## 1.2 Purpose of the Report

This report provides the results of Stage I of the Benchmarking exercise. In this Stage a first attempt has been made to gather information on UAQM from city authorities. The report provides a summary of UAQM policies and practices in 12 Asian cities.

## 1.3 Benchmarking UAQM in Asian Cities

The desired outcomes of air quality management policies include:

- **establishing air quality monitoring** which is a systematic network to monitor urban air pollutants;
- **reducing air pollution impacts** and improving urban air quality and reducing the impact on human health; and
- **implementing effective control and enforcement strategies** based on air quality and emission standards.

Benchmarking allows an assessment of the progress each city has made in achieving these desired outcomes. It is a practical tool for improving performance by learning from good practice and understanding the processes by which they are achieved. The benchmarking approach adopted by APMA involves three key parts:

- 1 **Assessment** of the UAQM situation to gain a detailed understanding of the state of urban air quality in Asia and UAQM processes. Existing data available on UAQM in Asia will be collated. This includes the WHO Air Management Information System (AMIS) database as well as other sources from other international and regional organizations such as the World Bank (WB), Asian Development Bank (ADB) and UNEP. The data covers types of urban air pollutants and emission data by sector. Gaps in information will be identified and national and local authorities will be contacted to gain further information.
- 2 **Review** of approaches taken to UAQM in cities in Europe and North America.
- 3 **Conclusions and recommendations** based on lessons learnt in UAQM and the necessary changes required to improve practice in Asia.

The results of the study will support a Strategic Framework for Common Action in UAQM in the Asian Region.

## 1.4 Methodology

In order to provide a benchmark of UAQM in the Asian cities, local and national government agencies in different countries were contacted and asked to respond to a questionnaire and to provide data and information

on the city's background, urban air quality trends for specific pollutants, air quality monitoring networks, impact of air pollution, enforcement and control strategies, and best practices. The questionnaire was based upon the Management Capabilities Index used by the GEMS/AIR study which assessed UAQM capabilities in 20 major cities (MARC/UNEP/WHO, 1996).

Since air quality management differs in each city and country and it was not always possible to receive data directly from city authorities. In these cases, national government agencies were contacted since this was where most, in some cases all, the official UAQM data and information were available. Where data were not available, external data sources were used. For example, the city and country data for pollutant concentrations for various pollutants was cross-referenced with data from the WHO AMIS database concentrations. If there was little discrepancy, the city/country data was used. In the majority of cases, all sets of available data were reported.

## 1.5 Limitations of Available Data

Of the total twenty-two cities or national government air quality agencies contacted, only eighteen responded and submitted some information requested for the benchmarking exercise rather than complete the

questionnaire. This report examines UAQM in 12 Asian cities.

The results of the Stage I of the Benchmarking exercise will be discussed at the Regional Workshop in Hong Kong in December 2002. It is hoped that further collaboration from cities authorities can be gained in providing additional information on UAQM in order that the final report can provide a comprehensive account of air quality in Asian cities.

Stage II of the Benchmarking exercise will attempt to fill in the gaps in UAQM information and make a further detailed assessment using again the questionnaire and including case study examples of practice in Asian cities.

## 1.6 Structure of the Report

Following this general introduction, the remainder of the report is divided into four chapters. Chapter 2 provides an overview of the factors that contribute and cause urban air pollution in Asia. Chapter 3 provides a summary of UAQM and practice in 12 Asian cities. Chapter 4 reviews approaches to urban air quality management in European and North American cities. Chapter 5 provides the a summary and conclusions of Stage I.