

# Asian Mega-Cities

Tokyo • Seoul • Beijing • Shanghai

## Urban Energy Use and Greenhouse Gas Emissions in Asian Mega-Cities

POLICIES FOR A SUSTAINABLE FUTURE



**IGES**

Urban Environmental Management Project  
Institute for Global Environmental Strategies

  
IHPD - Industrial  
Transformation

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# Author's Note

This report is one of the outcomes of a research project entitled “Urban Policy Integration of Energy-Related Environmental Issues in Selected Asian Mega-Cities,” which was undertaken from April 2001 to March 2004 by the Urban Environmental Management Project (under the leadership of Professor Hidefumi Imura) of the Institute for Global Environmental Strategies (IGES) with support from a number of researchers from Korea, Japan and China. A number of outcomes, namely, a comprehensive database on four cities, articles for academic journals, conference papers and publications in various newsletters and magazines have already been published. IGES, a strategic policy-oriented research institute, regards outreach, multi-stakeholder dialogues and capacity-building activities as integral parts of its research activities. Accordingly, researchers involved in this project have disseminated research outcomes to city policy makers, national governments and international institutions through various forums of policy dialogue, including those of the International Council for Local Environmental Initiatives (ICLEI), the Kitakyushu Initiative for a Clean Environment, and Clean Air Initiative for Asian Cities (CAI-Asia), as well as a number of scientific circles such as the International Human Dimensions Programme (IHDP) for Global Change Research.

This report is intended to integrate all major outcomes and to provide a holistic overview of the analyses of four cities. Since its audience includes experts as well as non-experts, it is written in a manner that is easy to read.

# List of Abbreviations

ALS	Area licensing system
APN	Asia Pacific network
ARF	Additional registration fees
BCAS	Bangladesh Centre for Advanced Studies
CAI-Asia	Clean Air Initiative for Asian Cities
CBD	Central business districts
CDM	Clean development mechanisms
CHS	Cooling and heating systems
CIF	Cost-insurance-freight
CNG	Compressed natural gas
CO <sub>2</sub>	Carbon dioxide
COE	Certificate of Entitlement
COP3	Third Conference of the Parties
CP	Clean production
DANIDA	Danish International Development Assistance
EKC	Environmental Kuznet Curve
ERP	Electronic road pricing system
ERPR	Environment and Resources Protection Committee
EURO IV	European Union emission standard IV
EV	Electric vehicle
FGD	Fluidised gas desulphurisation
GEF	Global environmental facility
GHG	Greenhouse gas
GLIDE	Green Link Determining System
GPS	Global Positioning System

GRP	Gross regional product
HDB	Housing Development Board
ICLEI	International Council for Local Environmental Initiatives
IGES	Institute for Global Environmental Strategies
IHDP	International Human Dimensions Programme
IHDPI	International Human Dimensions Programme
IIED	International Institute for Environment and Development
I-O	Input-output
IPCC	Intergovernmental Panel on Climate Changes
IT	Industrial transformation
ITS	Intelligent transport systems
IU	In-vehicle units
IZET	India Zero Emission Transportation Program
LNG	Liquid natural gas
LPG	Liquefied petroleum gas
LTA	Land Transport Authority
MCI	Ministry of Communications and Information
MRT	Mass rail transport
MSW	Municipal solid waste
MTCE	Million ton of coal equivalent
NGO	Non-government organisation
NO <sub>x</sub>	Nitrogen oxides
ODA	Overseas development agency
OECD	Organisation for Economic Cooperation and Development
OMV	Open market value
PPP	Parity in purchasing power
PM	Particulate matter
PM <sub>10</sub>	Particulate matters of less than 10 microns
RZ	Restricted zone
SCP	State and City Planning Project
SG\$	Singapore Dollar
SEPA	State Environmental Protection Agency, China
SME	Small and medium size enterprises
SO <sub>x</sub>	Sulphur oxides
SPM	Suspended particulate matters





START	global change SysTems for Analyses, Research and Training
TMG	Tokyo Metropolitan Government
TOE	Tonne of oil equivalent
TOD	Transit-oriented development
TSP	Total suspended particles
ULEV	Ultra low emission vehicles
UNFCCC	United National Framework Convention on Climate Change
USAID	United States Agency for International Development
URA	Urban Redevelopment Authority
US-AEP	United State-Asia Environmental Partnership
USAID	United States Agency for International Development
VQS	Vehicle quota system
WHO	World Health Organisation