Integrating GHG mitigation in local environmental management in Asian Cities

Moving forward on practical climate change cooperation

Prof. Hidefumi Imura, imura@genv.nagoya-u.ac.jp
Professor, Graduate School of Environmental Studies, Nagoya University
Project Leader, Urban Environmental Management Project, IGES

Dr. Shobhakar Dhakal, dhakal@iges.or.jp
Senior Policy Researcher, Urban Environmental Management Project

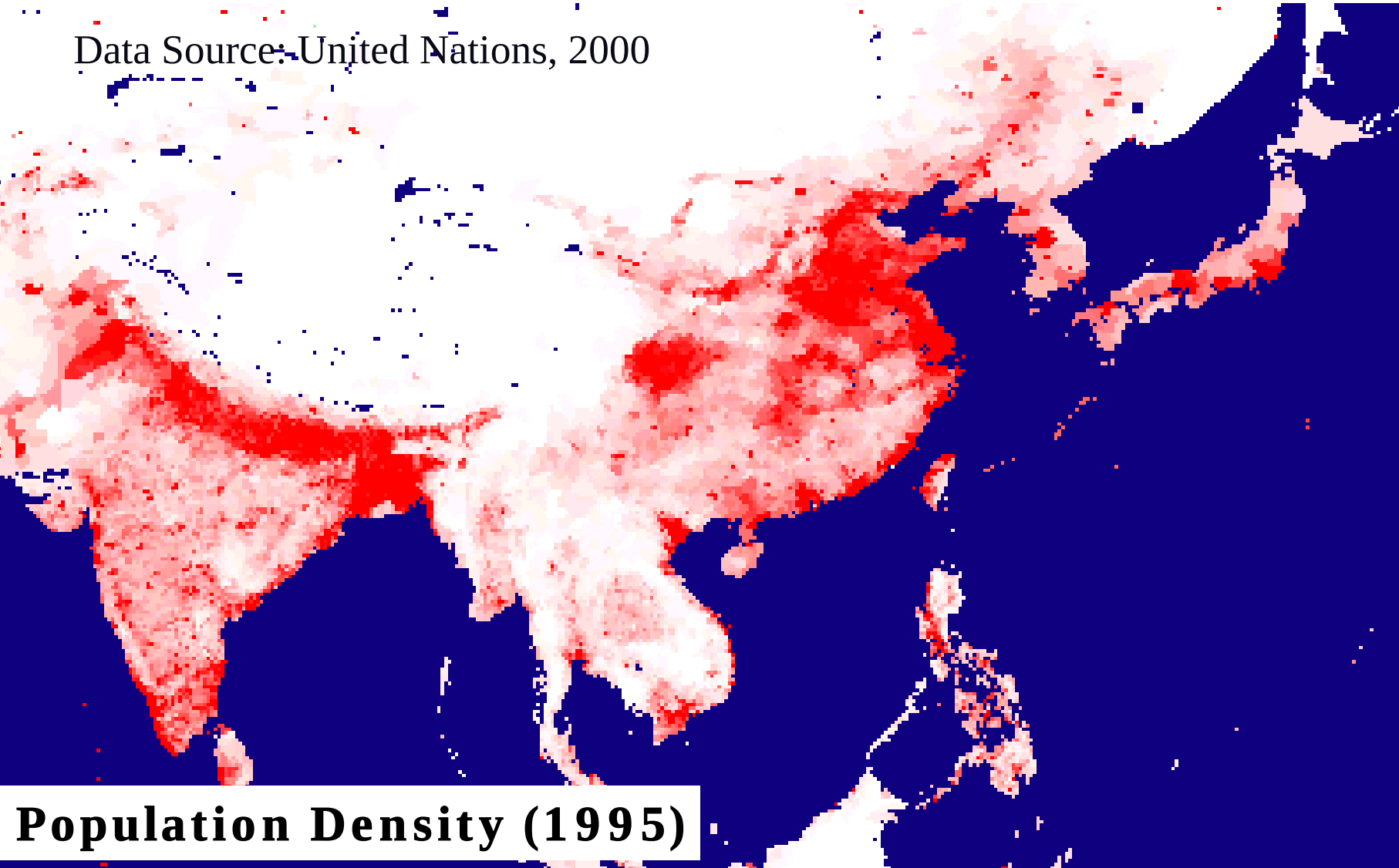
http://www.iges.or.jp/en/ue


Night-time Light Image
In this decade…
•2008 Beijing Olympic Games
•2010 Shanghai / Expo
Beijing
Seoul
Tokyo
Shanghai
Climatic Change
•Increasing Role of Urban Sector
•Transportation, Commercial & Residential Sectors
•Common Agenda for Different Policies
Urbanization in Asia
•Rapid Urban Growth
•Energy
•Material
•Megacities

Urbanization in Asia

Cities = GHG Emission Sources = Air Pollutants Sources

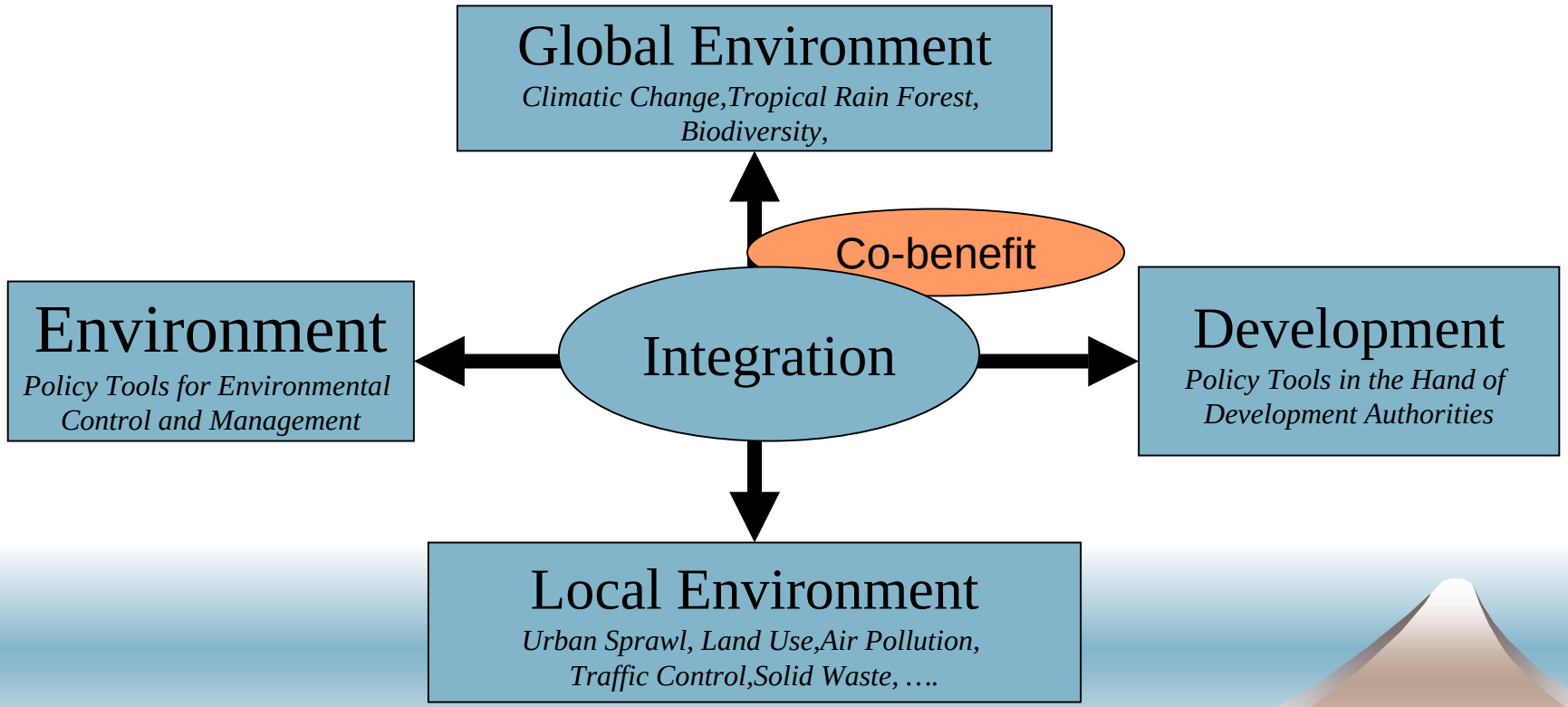
Data Source: United Nations, 2000



Population Density (1995)

Integration of Global and Local Environmental Actions

- "Think Globally and Act Locally"



How to Manage Energy & Local Air Pollution in Asia

- Need of integrated approach (air pollution control + energy conservation)
- Need of low-cost approaches / methods
- Different approaches relevant to different types of cities (financial capacity + size of cities)
- What are good practices, and how they can be transferred?

Integration of Urban Environment and Climatic Change Policies

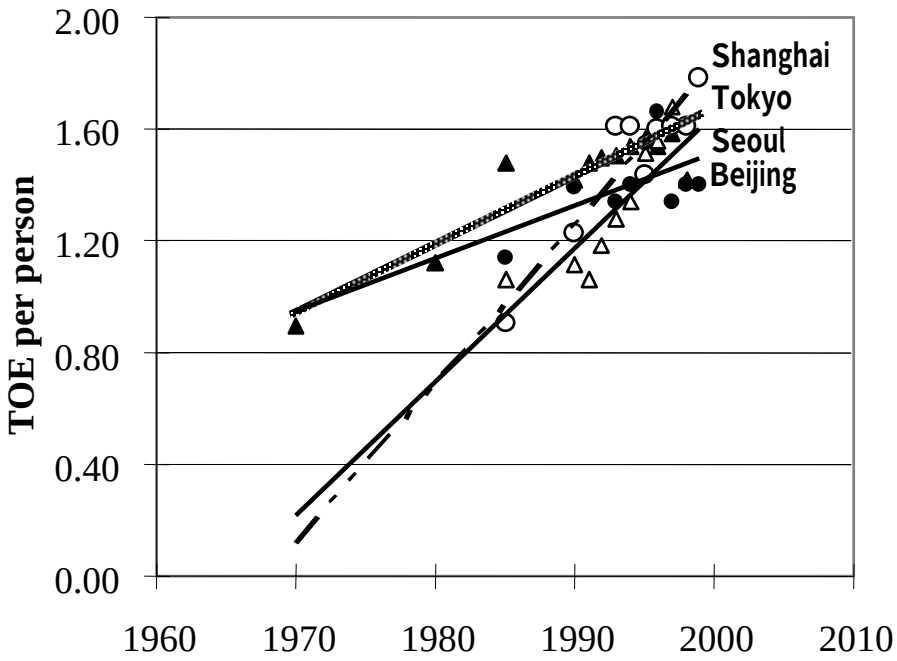
Local Policy ➔ Energy Consumption & GHG Emissions

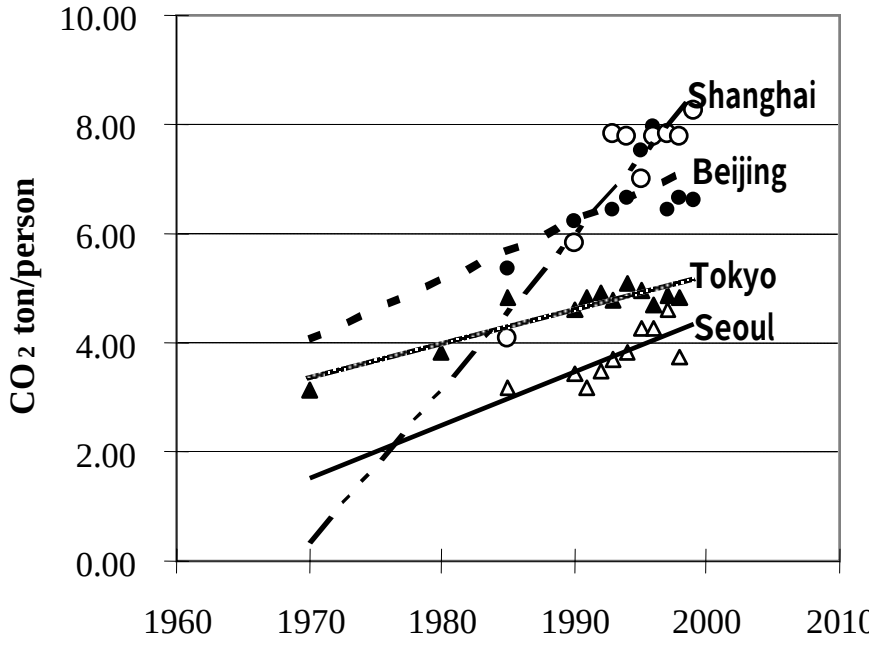
- Land Use Planning for Sprawl Control
- Urban Greenery
- Public Utilities (Electricity, Gas, Water)
- Traffic Control
- Public Transportation Systems (Bus, Subway, Railway)
- Building Insulation Regulation
- Air Pollution Control
- Municipal Waste Collection, Treatment & Disposal (➔methane)

Assessment of Global Environmental Implications

Rebuilding of the Local Policy for the Global Environment

Energy choice





Economic Growth ➔ Urban Growth ➔ Energy Growth ➔ Is there a Limit

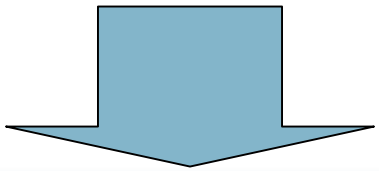
Seoul: Seoul City
Tokyo: Tokyo-to
Beijing and Shanghai: Political boundary

Energy efficiency

ty	1970-80	1980-90		1990-98	
		1980-85	1985-90	1990-97	1997-98
okyo	High economic growth (8.5%) Moderate emission growth (2.5%)	High economic growth (6.3%) Moderate emission growth (2.3%)		Negative economic growth (-0.4%) Low emission growth (0.7%)	
eoul				High economic growth (5.9%) Moderate emission growth (4.57%)	Negative economic growth (-16.3%) Negative emission growth (-19%)
eijing			High economic growth (7.25) High emissions growth (6.5%)	High economic growth (14.5%) Low emissions growth (2.7%)	
hangh			Low economic growth (2.3%) High emissions growth (11%)	High economic growth (20.7%) Moderate emissions growth (5.6%)	

Constraints for GHG mitigation for city policy makers

- Low priority for global issues at local level
- Lack of information
- Lack of incentives / Financial constraints
- Lack of technical and institutional capacity
- All measures to reduce air pollution do not necessarily reduce GHG



New Initiatives by Cities

Ongoing efforts in IGES: Urban Environmental Management

- Clarifying the picture of energy and CO2 emissions from mega-cities (Tokyo, Seoul, Beijing and Shanghai) in Asia
- Helping city policy makers to identify and implement plausible solutions through strategic research and increasing awareness
- Cooperating internationally with USEPA (for BAQ, identifying options for joint projects, etc.) and other organizations to try to make co-benefits programs and projects as effective and complementary as possible
- Mobilizing international community to assist local policy makers for integrated measures ➔ Promotion of inter-city Cooperation: ESCAP-Kitakyushu Initiatives

Recent Developments in Tokyo

Institutional Responses to NOx and SPM

- Low sulphur content fuel[1]
- Tougher standards and inspection system for diesel vehicles[2]
- Incentives to low emissions vehicles[3] and
- Others, such as travel demand management (TDM) and joint initiatives amongst neighbouring cities

[1] Petroleum Association of Japan, under Tokyo's requests decided to start supplying the diesel containing 50 PPM (0.005 % S by weight) Sulphur by April 2003 in contrast to national target by the end of 2004.

[2] Ordinance on Environmental Preservation of TMG enforces diesel vehicle control regulation from October 2003, applicable to buses and trucks. Non –complying diesel vehicle (for PM regulation) will faces stricter penalties based on age of vehicles (if more than 7 years old, it should be replaced by low-pollution vehicles or equipped with certified PM reduction system. Sticker system is introduced for vehicles in which PM reduction system is installed.

[3] Includes preferential car tax for low emission vehicles, financial benefits for CNG bus operators and fuelling stations, discounted parking fee system for certified ultra-low emission vehicles. The categorisation for low-emission vehicles are made depending on how much less a vehicle emit compared to the national standards: fairly low –25% less; highly low – 50% less; and ultra low- 75% less. These vehicles are distinguished by one-, two- and three-star stickers on them respectively.

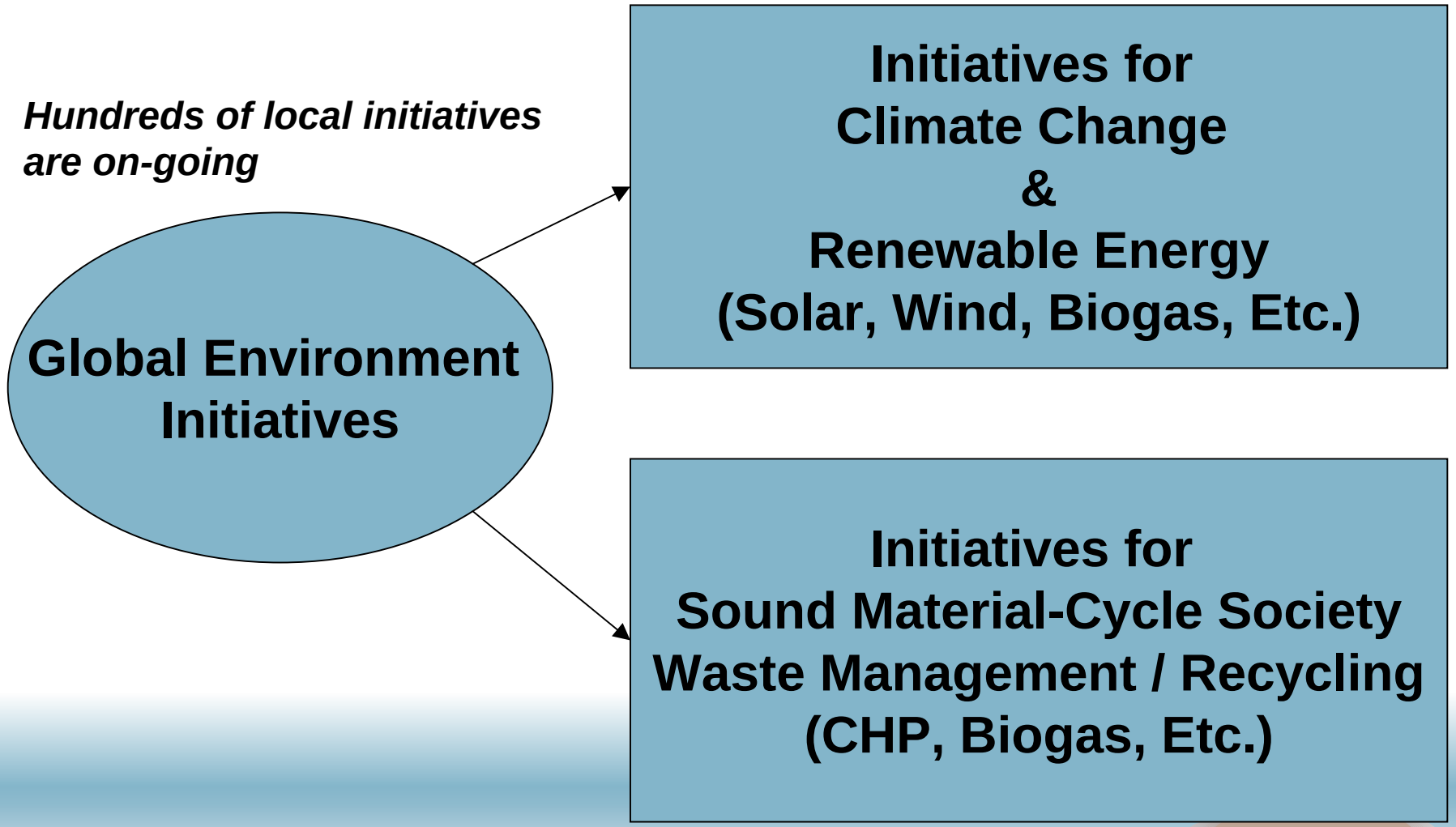
Recent Developments in Tokyo

Institutional Responses to CO2

- Well placed regulatory frameworks and plans for GHG emissions control
- Ambitious numerical targets (6% of 1990 or 12% of 2000 or 20% of BAU 2010)
- Institutional arrangements (creation of a separate division)
- Stop Global Warming Campaigns
- Energy efficiency improvements by appliances labeling, green building plan, corporate energy use
- Sink Enhancement through Tokyo Green Plan and Green Building Plan

Initiatives of Japanese Cities

Hundreds of local initiatives are on-going



Recent Developments in Seoul

- **Comprehensive plan for GHG mitigation doesn't exist but pressure is mounting**
- **Some emphasis on GHG mitigation through interventions on air pollution (CO2 as co-benefit)**
- **Some of the key programs affecting CO2 are:**
  - **District heating (about 453,000 by 2007)**
  - **Interventions for cleaner fuel (such as LNG for boilers)**
  - **Building energy performance improvement measures such as insulation and rating system**
  - **Usual air pollution control measures in transportation sector including CNG buses, stringent standards by 2006**
  - **Law concerning vehicle engine idle-ing prohibition in certain places**
- **Ambitious 2003-2012 Plan to reduce PM10 to 40 mg/m^3 and to NO_2 to 22 $microgram/m^3$**

Recent Developments in Beijing

- No CO2 countermeasure plans
- Six stages of emergency measures (1998 December) to combat air pollution (coal quality, natural gas use, CHP systems, traffic, tighter emissions standards, old vehicle scrapping, in-use vehicles inspection, retro-fitting taxies with dual engine etc.)
- Impact: SO_2 concentration reduced to $80\mu g/m^3$, a significant decrease rate of 33%, while the PM_{10} concentration reduced to $162\mu g/m^3$, a decrease ratio of only 8%
- Ambitious plan to meet the WHO standards before 2008 involving energy structure changes, infrastructure development, tougher emission standards, improved I/M systems, public transport on gas (LPG and NGV)

Recent Developments in Shanghai

- No explicit policies for GHG reductions apart from co-benefits of energy saving and air pollution management
- In 1999, Shanghai Municipal Government drafted a plan where energy and environmental policy are addressed
  - 55% reduction of coal as a primary energy source by the year 2010
  - Securing 3 GW electricity imports from the Three Gorges Dam and the nuclear plant at Qinshan
  - Increasing natural gas share to 10-12% in primary energy supply in 2010
  - Regulatory measures for prohibiting new coal-boilers in core city
  - Controlling the number of registered vehicles to 16 million in 2010
  - Limiting SO_2 emission to 420 kt/year in 2010
- Singapore style auctioning of registration permits for new vehicles

Realities in cities.....

- **Less developed cities**: capacity of local policy makers are weaker, resources are scarce, institutions for urban environmental governance are less developed, involvemen of stakeholders are less pronounced, local issues dominates priority
- **Rapidly developing / industrialising cities**: capacity of local policy makers are improving rapidly, resources are scarce but starting to build up, local institutions are being built up, local issues dominated attention but there has been growing awareness on need to consider newly emerging issues such as global warming
- **Relatively developed / matured cities**: condition are better than rest of the Asia and local government are under growing pressure to tackle emerging global environmental issues.

Urgent needs: Identifying the prospects for synergy and constraints for integrated approach for air pollution and GHG mitigation and promoting such measures

- **Strengthening CO_2 concerns from urban transportation**
- **Strengthening institutional capacity and local-national cooperation**
- **Transitions from sectoral approach to holistic planning**
- **Exploiting existing niche opportunity for CO2 abatement and creating momentum for change**
- **Promoting exchange of experiences**
- **Enhancing the role of international institutions in promoting integrated measures**

Integrated Approach

Energy and CO2

- Air pollution control + Measures against climatic change + Urban planning + Economic development
- Domestic solution + Regional cooperation
- Cleaner cars + Transportation management
- Regulation + Economic incentives
- New energy sources (solar, wind, biogas, etc.)
- Concerted efforts of all stakeholders

Non-Energy

- Measures for Sound Material-Cycle Society (3R-Reuse, Reduce & Recycle of materials) + Energy Recovery (incineration) + Waste Disposal (methane recovery)

What Cities can do?

- Need of local government initiatives
- Enforce regulation and standards and other locally viable instruments
- Traffic control, parking regulation, car inspection, etc.
- Encourage local people participation
- Promote education and campaign
- Disseminate information about health risks to local people

Thank you!