

Green Infrastructure and Buildings: Ensuring Sustainability of Small and Medium Scale Cities

An overview

Ranjith Perera, PhD

Urban Environmental Management Program, AIT



AIT

Asian Institute of Technology

Actions towards Resource-efficient and Low Carbon Cities in Asia

Outline

- Background
- Green infrastructure and buildings for mitigating GHG emissions
- AIT-ADEME Partnership: Actiona towards Resource-efficient and Low Carbon Cities in Asia

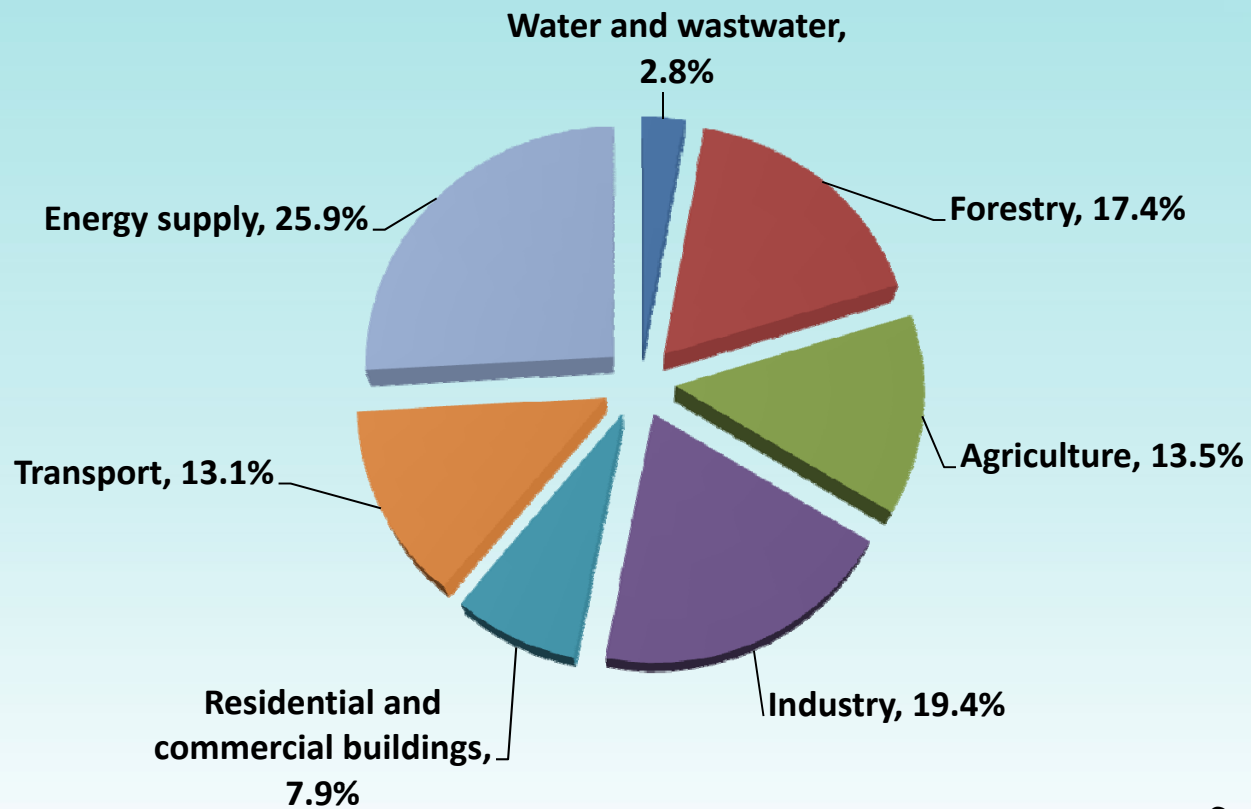
Background

Cities are major sources of GHG emissions

- Cities account for more than **71% of global greenhouse gas emissions** and their share is expected to rise to 76% by 2030
- Currently, 18% of the world's population living in developed countries account for 47% of global CO₂ emissions, while the **82% of the world's population living in developing countries account for the remaining 53%**
- However, per capita CO₂ emissions are far higher in developed countries than in developing countries
- It is predicted that **89% of the increase** in CO₂ from energy use over the next 20 years will be from developing countries

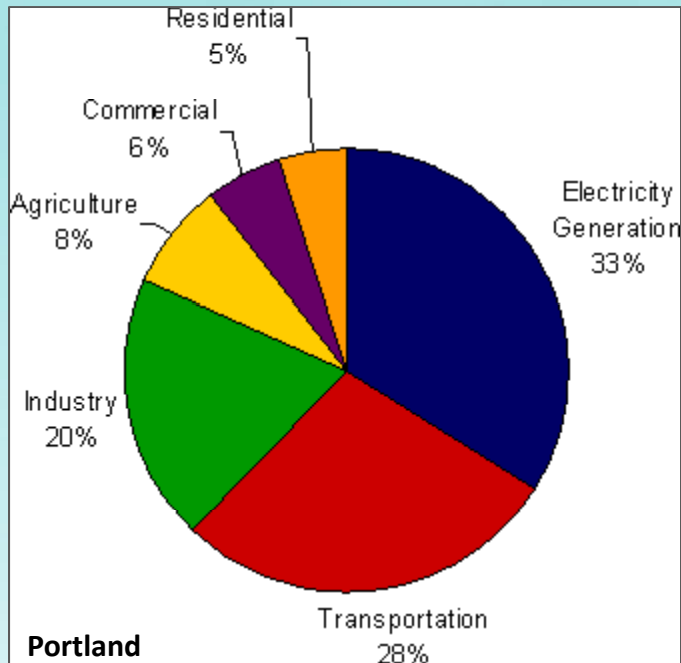
(Source: IEA, 2009; UNHABITAT, 2011)

Distribution of GHG emissions throughout the world by sectors (in 2004)



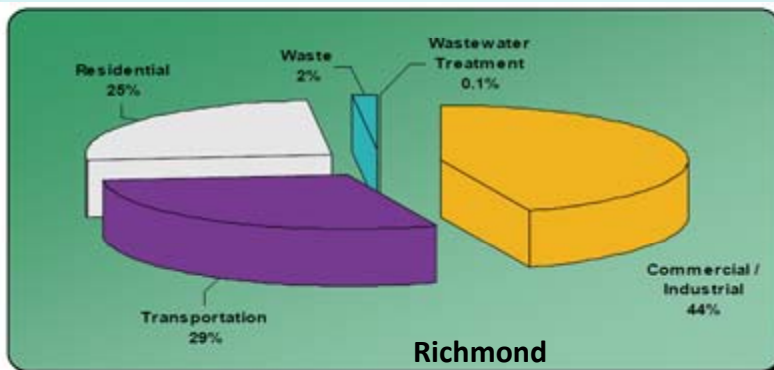
Source: IPCC, 2007

Sector-wise Distribution of Carbon emission



Key sectors in cities having potential to mitigate carbon emission

- Electricity generation and consumption
- Built environment
- Industry
- Transport
- Waste
- Urban greenery



**Greener Infrastructure and Buildings
Sustainable Consumption and
Production**

Green infrastructure and buildings for mitigating GHG emissions

Green infrastructure and buildings: What are they?

If infrastructure and buildings;

- minimize resource use and ecological impacts throughout their life cycles
 - manage and operate in a sustainable way
 - deliver economically viable goods and services
 - generate employment opportunities for local people
 - socially acceptable
 - preserve ecosystem integrity, and
 - contribute to climate change mitigation and adaptation
- they are **green infrastructure and buildings**.

Climate Change Mitigation Responses in Cities related to infrastructure and buildings

Domain of intervention	Examples
Urban development and design	Restructure cities with more efficient infrastructure and reduce travel
Built-environment	Energy efficient and compact buildings that depend on less resources
Service provision	Supply of renewable energy and recycling of water and waste
Transport	Low-carbon transport infrastructure and modes such as LRT/MRT
Carbon sequestration	Tree planting, Carbon capture and use, carbon offset schemes

Some of the GHG mitigation measures are practiced mostly in big and metropolitan cities

Small and medium cities need to follow suit and avoid the unsustainable path followed by big cities in urban development.

Partnering Cities

City /Country	Population	Density of population/km ²	Major activities
Da Nang, Vietnam	887070	600	Industry and port
Rayong, Thailand	61,000	5,900	Industry and port
Kurunegala, Sri Lanka	40,000	316	Trade ad services
Matale, Sri Lanka	40,311	226	Trade and services
Nonthaburi, Thailand	262,067	4,591	Trade and services
Chau Doc Town, Vietnam	117,721	1,129	Trade and services
Kandy, Sri Lanka	120,000	4,106	Toursim and trade
Luang Prabang, Lao PDR	103.000	30	Tourism and trade
Hue, Vietnam	340,000	194	Tourism and trade
Chiang Mai, Thailand	142,970	687	Tourism and trade

Technical Support for Partnering Cities for Carbon Emission Profiling and Climate Action Planning

The **French Environment and Energy Management Agency (ADEME)** has developed methodologies and tools – **Bilan Carbone[®]** and **Territorial Climate and Energy Plan (TCEP)** to assist companies, administrations and local authorities in their pursuit of fighting against climate change.

Bilan Carbone®



- ✓ A tool to assess the direct and indirect GHG emissions from the different economic activities of a given territory

Territorial Climate and Energy Plan (TCEP)

- ✓ Develop action plans based on the identified paths and their policies related to urban planning and management, transport, housing, etc.
- ✓ Mitigate GHG emissions and reduce the territories' vulnerability to climate change

THANK YOU!

Contact Address:

Action towards Resource-efficient and Low Carbon Cities in Asia

Asian Institute of Technology

P. O. Box: 4, Klong Luang

Pathumthani 12120, Thailand

Email: lcc@ait.asia

Tel: +66 2 524 6212

Fax: +66 2 524 5439

Website: <http://lcc.ait.asia>