



SUSTAINABLE  
ENERGY FOR ALL

# Energy Challenges for Cities and City-level Responses

**TECHNICAL EXPERT MEETING;  
Accelerating Energy Efficiency Action  
in Urban Environments:  
More Faster Now**

**UNFCCC, Bonn  
5-6 June, 2015**



**UNEP DTU  
PARTNERSHIP**

**COPENHAGEN CENTRE  
ON ENERGY EFFICIENCY**  
SE4ALL EE HUB



# Why Cities?



UNEP

United Nations Environment Programme

## Cities- Growth Trajectory

- More than 50% of the world population of 7 billion live in cities
- Cities account for 75% of the energy use and 80% of CO<sub>2</sub> emissions
- By 2050, 70% of the world population will be in cities, indicating close to 90% of the population growth is expected in cities
- Number of mega cities will grow significantly, number of >1 million cities will be in the in thousands
- City authorities are significant energy users, and can play an important role in using energy efficiently
- Cities are critical to bridging the global emissions gap



# Cities- Sustainable Growth Challenges

- Sustainable Buildings
- Sustainable Transport
- Sustainable Energy System
- Sustainable Water Supply
- Sustainable Businesses and Employment
- Sustainable Waste disposal Practices

Integrated Sustainable Development  
approach needed



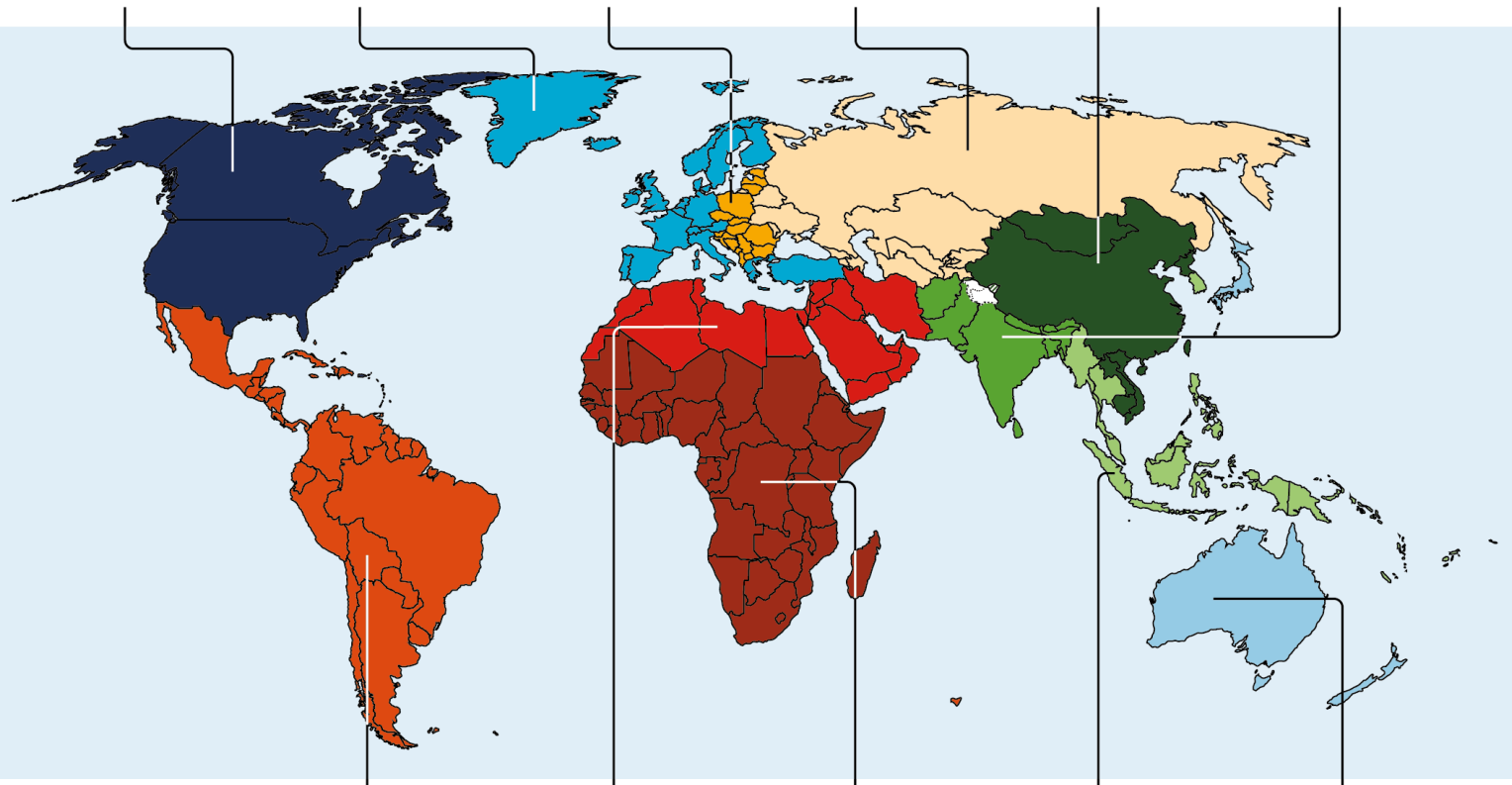
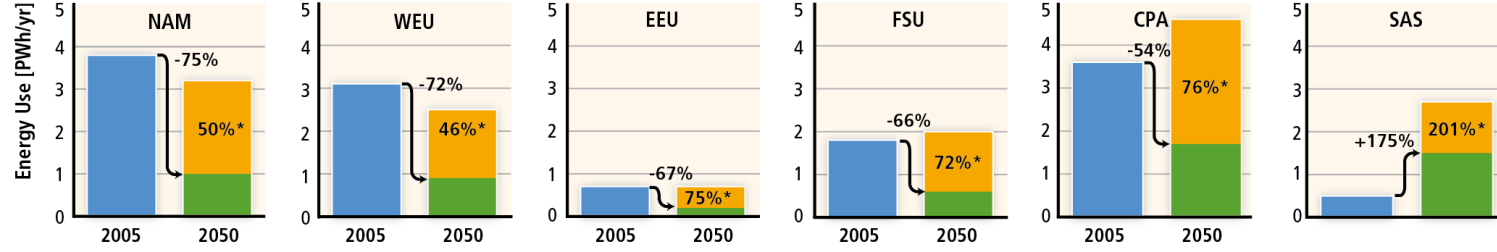
United Nations Environment Programme

# Options for City Responses

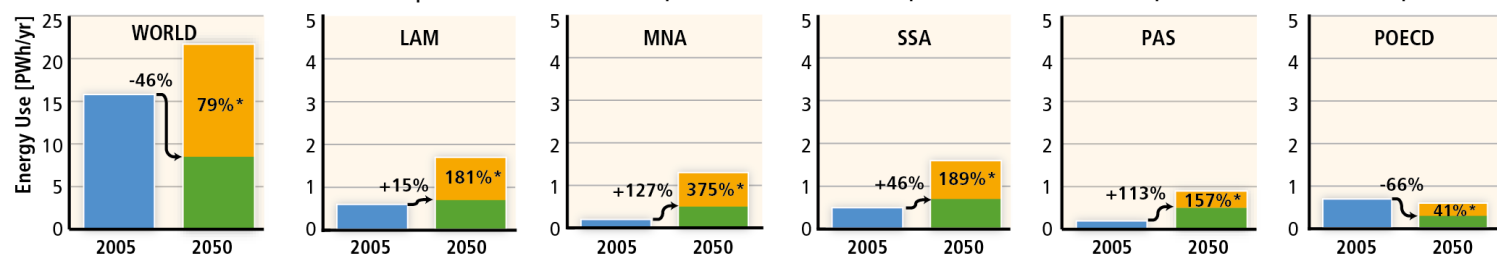
## Smart Cities, that focus on:

- Sustainable - energy efficient/net energy producing buildings e.g. solar integration in design
- Sustainable and efficient transportation (public, private, non-motorized)
- Energy and climate friendly urban planning and design
- "Smart" systems using IT options at all levels, managing consumption, integrating demand and supply planning
- Efficient and flexible street lighting
- District energy heating/cooling





Potential to reduce final energy use for space heating & cooling through energy efficiency



Source: IPCC. 2014. Fifth Assessment Report. Working Group III. Chapter 9

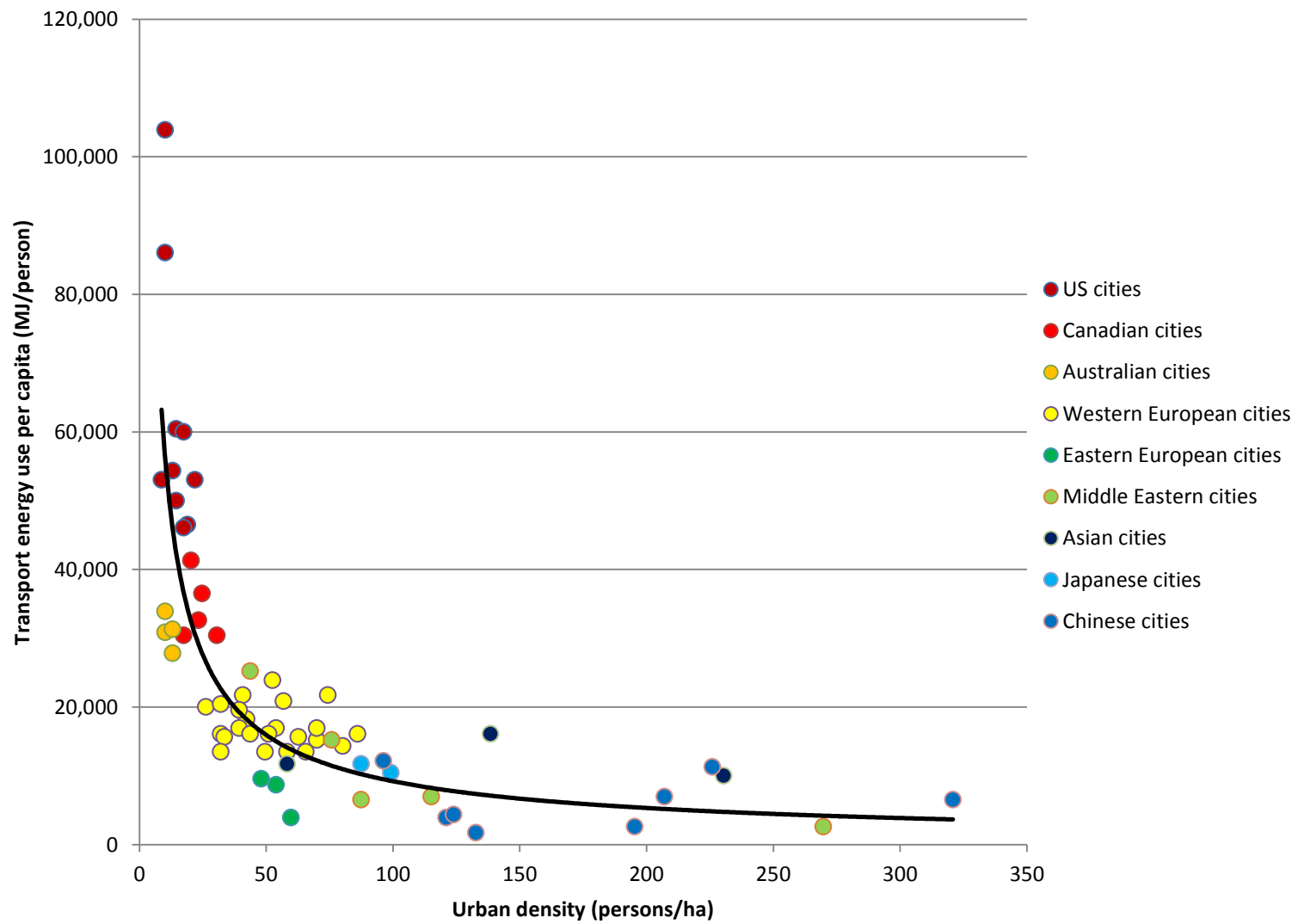
■ Historic Energy Use    
 ■ Difference from State-of-the-Art to Moderate Scenario    
 ■ State-of-the-Art Scenario



\*Lock-in Risk of Sub-Optimal Scenario Relative to Energy Use in 2005.

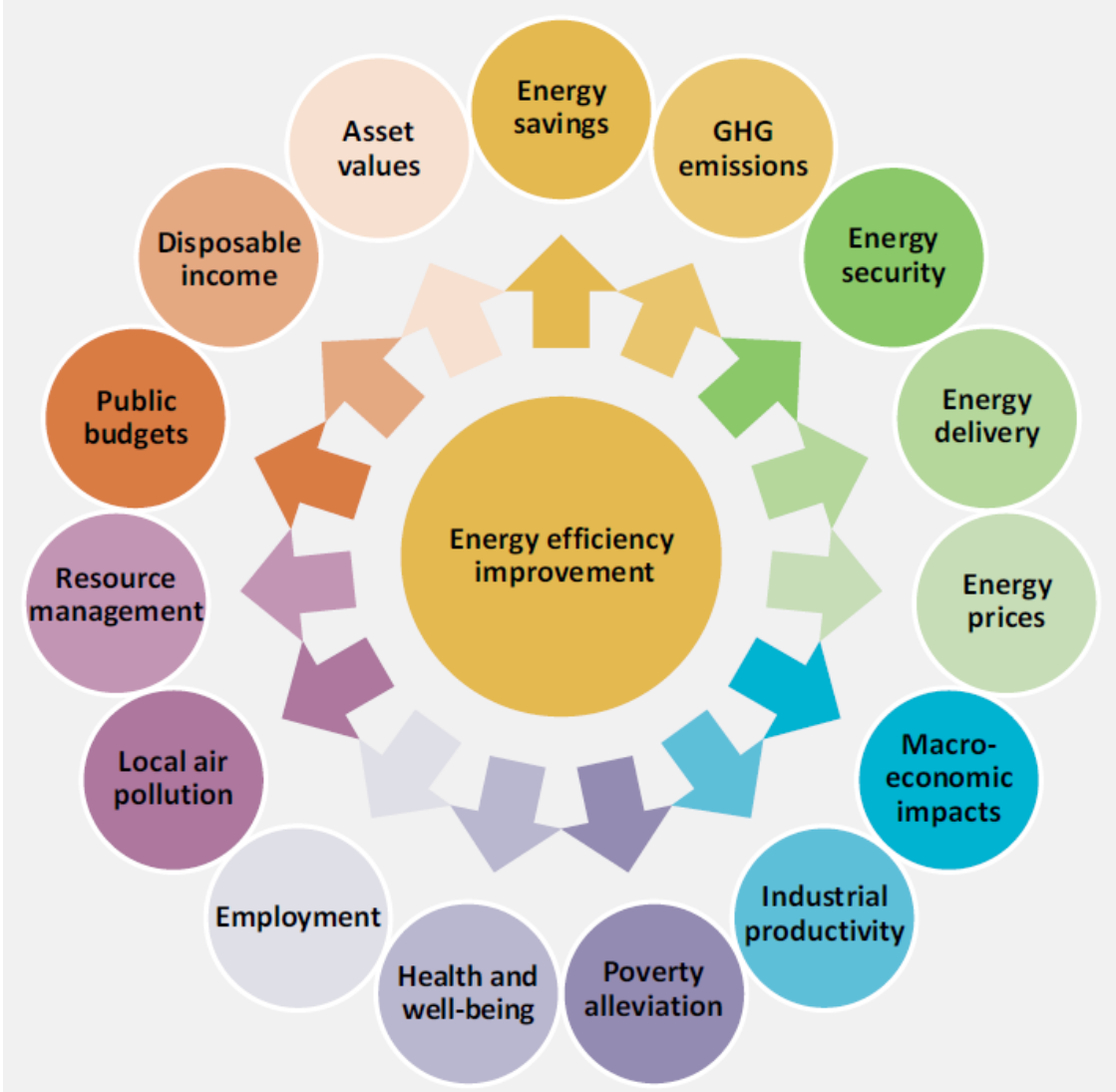
# Designing the urban development

## Relationship between urban density and transport energy use



Source: UDP Transport Guidebook

# Multiple Benefits of Energy Efficiency



Source: IEA, 2014

# Case of Bogota (ESMAP)

## Matrix with energy efficiency priorities and proposed programs

<b>PRIORITY 1</b> Public Transport	Energy spending in the sector		Potential savings		
	\$917,935,197		\$165,000,000		
	Responsible Institution	Cost	Energy savings potential	Time of implementation	
1. Public Transport Development	Department of Transportation	\$\$\$	***	> 2 years	
<b>PRIORITY 2</b> Private Transport	Energy spending in the sector		Potential savings		
	\$1,390,516,286		\$295,000,000		
	Responsible Institution	Cost	Energy savings potential	Time of implementation	
2. Non-Motorized Transport Modes	City	\$\$\$	**	> 2 years	
<b>PRIORITY 4</b> Street Lighting	Energy spending in the sector		Potential savings		
	\$32,850,000		\$6,800,000		
	Responsible Institution	Cost	Energy savings potential	Time of implementation	
	3. Street Lighting Audit and Retrofit	City/Codensa	\$\$	***	1-2 years
	4. Procurement Guide for New Street Lights	City/Codensa	\$	***	< 1 year
5. Street Lighting Timing Program	City/Codensa	\$	***	< 1 year	
<b>PRIORITY 5</b> Potable Water	Energy spending in the sector		Potential savings		
	\$12,415,011		\$1,390,000		
	Responsible Institution	Cost	Energy savings potential	Time of implementation	
6. Active Leak Detection & Pressure Management	Acueducto	\$\$\$	***	> 2 years	
<b>PRIORITY 5</b> City Authority	Energy spending in the sector		Potential savings		
	N/A				
	Responsible Institution	Cost	Energy savings potential	Time of implementation	
7. Awareness Raising Campaign	City	\$	**	1-2 years	



# SE4ALL Engagement with Cities- Building and District Energy Accelerators

## District Energy Accelerator

Multi-stakeholder partnership which aims to accelerate the transition to low-carbon & climate resilient societies through modern district energy systems.

The initiative will leverage the pool of expertise across its partners to:

- **INCREASE** awareness on the potential of district energy and its role in achieving multiple benefits, showcase good practices and successful efforts globally;
- **PROMOTE** and strengthen local and national policies and enabling environments, including by identifying and overcoming barriers, enhancing capacity, and mobilizing support;
- **ENCOURAGE** the participation of private sector operators and investors to take a lead role in the shift towards modern district energy systems.



# Building Efficiency Accelerator

Three pillars of BEA's work:

Focus on Cities  
and Sub-national  
Jurisdictions



Public-Private  
Partnership



Policy & Project  
Development



The BEA is an international **multi-stakeholder partnership** devoted to helping cities and sub-national governments speed up implementation of best-practice **policies** and **efficiency projects** in buildings. It is designed to complement existing city networks with a venue for **engagement with private sector partners**.

**Thank You!**

