Leveraging ICTs for Smart Sustainable Cities (SSC)

Bangkok, Thailand
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City: an holistic system

The winning paradigm:
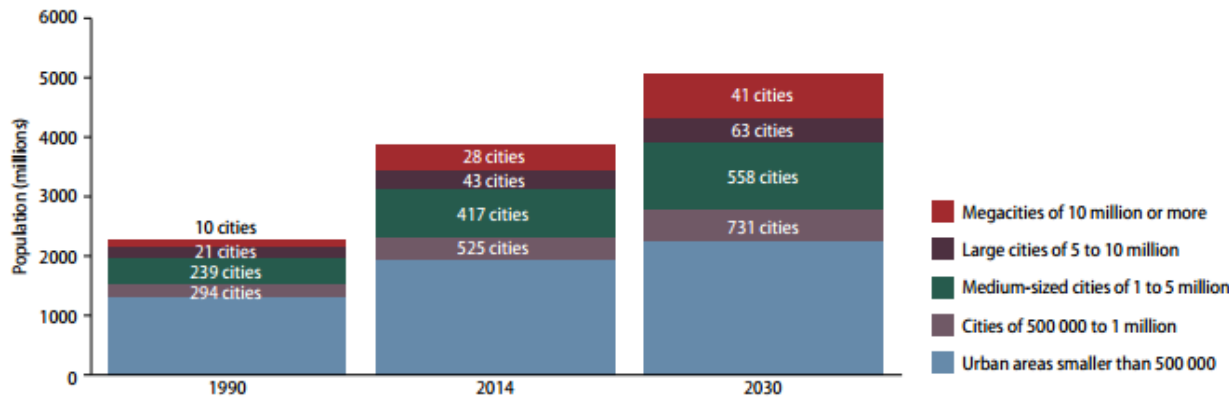
- Compete economically

- Growth sustainably

"Cities are the greatest creations of humanity" – Daniel Libeskind

Population and urbanization trends

Global urban population growth is propelled by the growth of cities of all sizes

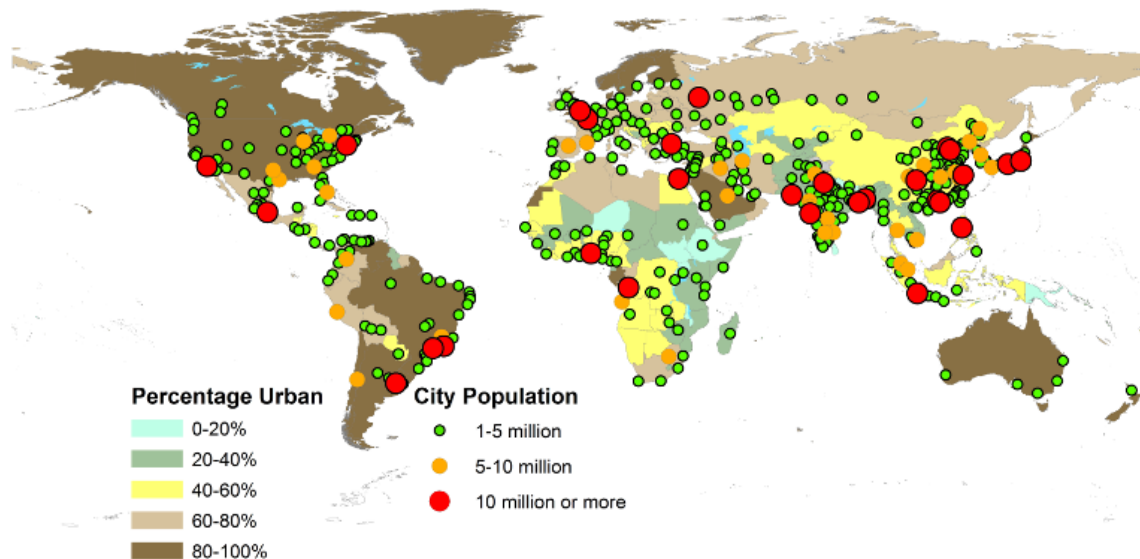|	
1990	10 cities / 21 cities / 239 cities / 294 cities
2014	28 cities / 43 cities / 417 cities / 525 cities
2030	41 cities / 63 cities / 558 cities / 731 cities

Megacities of 10 million or more
Large cities of 5 to 10 million
Medium-sized cities of 1 to 5 million
Cities of 500 000 to 1 million
Urban areas smaller than 500 000

4) Karachi 2.68%

5) Delhi 2.67%

3) Shenzhen 2.71%

1) Lagos 3.71%

2) Dhaka 2.84%

Percentage Urban
0-20%
20-40%
40-60%
60-80%
80-100%

City Population
1-5 million
5-10 million
10 million or more

Note: Designations employed and the presentation of material on this map do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Crisis or opportunity?

- **Climate change**
  (disaster management, mitigation and adaptation strategies)

- **Resource scarcity**
  (food, water, energy, waste management…)

- **Population growth**
  (migration, ageing, social inclusiveness…)

- **Economic feasibility**
  (low-carbon economy, jobs, innovation, infrastructure…)

Cities' diversity

- Cities are different and needs tailored solutions for their problems:
  - ➢ Geographical, historical, social and economic constraints
  - ➢ City as a complex unique system
- But all cities are about PEOPLE

New cities

Coastal cities

Historical cities

Mountain cities

Thinking smart, acting sustainable, living fulfilled

The 3 dimensions of smart sustainable cities

Sustainability

SSC

Smartness

Quality of life

Urban planning: designing dreams

The role of the urban planner:

- Dreaming about new solutions and turning desires into reality;
- Creating places where people can live;
- Creating places for business;
- Designing facilities;
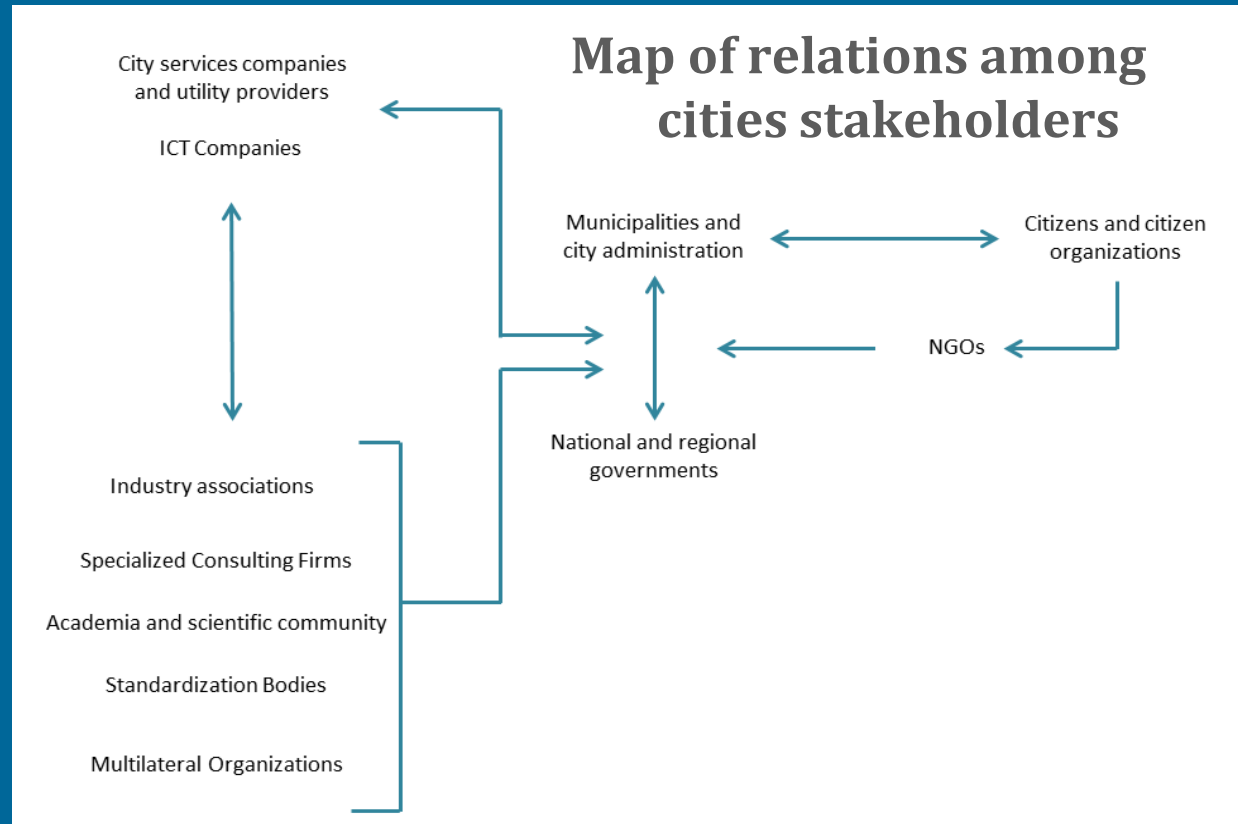- Creating new tools and material;
- Shaping the future.

spectrum.mit.edu

"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody." — Jane Jacobs

City governance: getting things done

The role of municipalities:

- Managing the complex city system;
- Engaging all stakeholders;
- Ensuring coordination among stakeholders;
- Explaining cities' potentials to citizens;
- Informing about cities' opportunities.

Map of relations among cities stakeholders

"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody." — Jane Jacobs

Transforming tomorrow
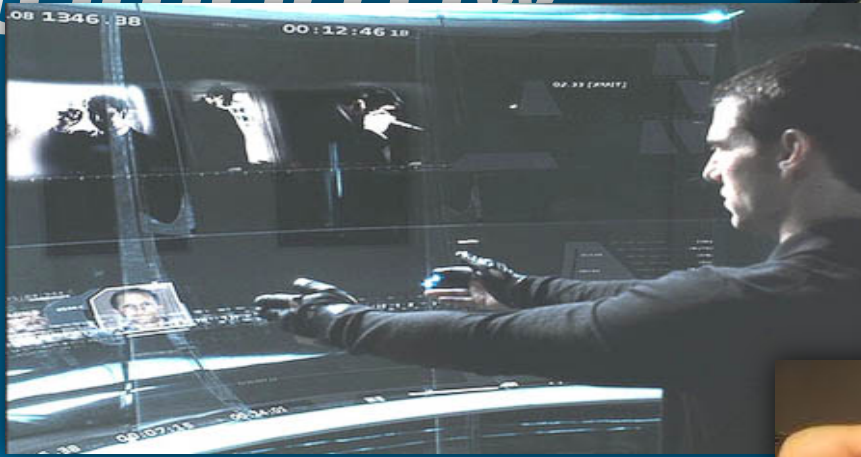
… smart thinking is here already!

Dublin, Ireland

London, United Kingdom

Amsterdam, The Netherlands

Turin, Italy

Boston, USA

Songdo, Korea

Singapore

Masdar, UAE

Johannesburg, South Africa

Barcelona, Spain

Rio de Janeiro, Brazil

Tomorrow's cities, today's technologies

Technology: turning traditional infrastructure into smart infrastructure

The role of ICT:

- wireless communications,
- sensor networks,
- data analytics,
- platforms and applications,
- cloud computing,
- technical standards.

Better data = better decisions

Intelligent infrastructure

Economic competitiveness

Green and sustainability

Low carbon businesses

Social inclusiveness

Citizens' engagement

From design to implementation

- Need for technological change, business change, policy change and social change;

- Establishing an holistic vision to determine what products to demand and what policies to adopt;

- Using technology to pursue three key drivers for any sustainable economy: productivity, inclusivity and resilience;

- Formalizing collaboration between technology and sustainability departments in any city agencies and between city agencies;

- Recognizing the appropriate scale to deploy technology investments;

- Generating public support and transparency in technology deployment;

- Developing technical standards to multiply sustainability achievements.

Setting the Vision for Smart Sustainable Cities

Standardizing
Monitoring
Accounting
Rethinking
Transforming
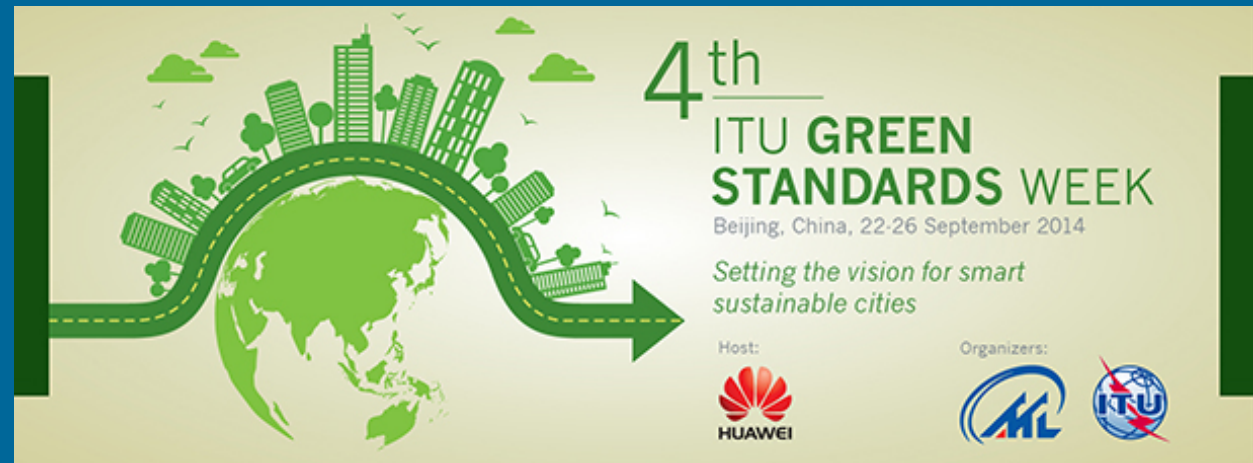
**Call to Action on
Smart Sustainable Cities**
Beijing, China

The case of the Asia Pacific region

- Asia Pacific regions includes 60% of the global population with 46% of population in the areas residing in urban areas.

- By 2020, urban population in the region is expected to rise to 50%.

- Main challenges: urban poverty, congestion, rising pollution levels, corruption, limited natural resources etc.

- Need for re-assessing urban design and implementation to ensure sustainable development in region.

Sydney, Australia

The **Sustainable Sydney** by 2030:

- energy efficiency (through green buildings, smart distribution networks, use of renewable energy),
- waste management,
- water management (through smart metering systems),
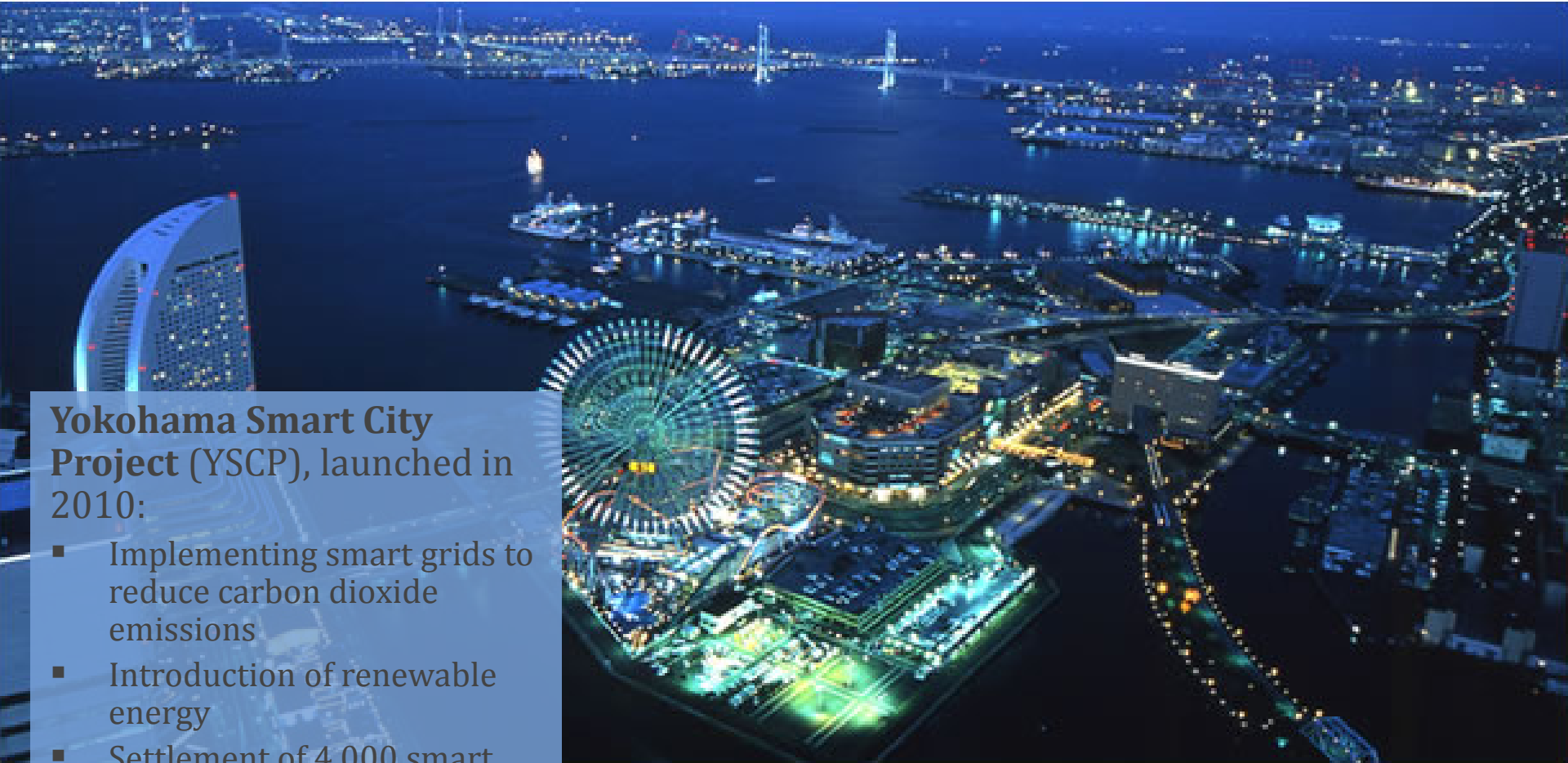- reduction greenhouse gas (GHG) emissions
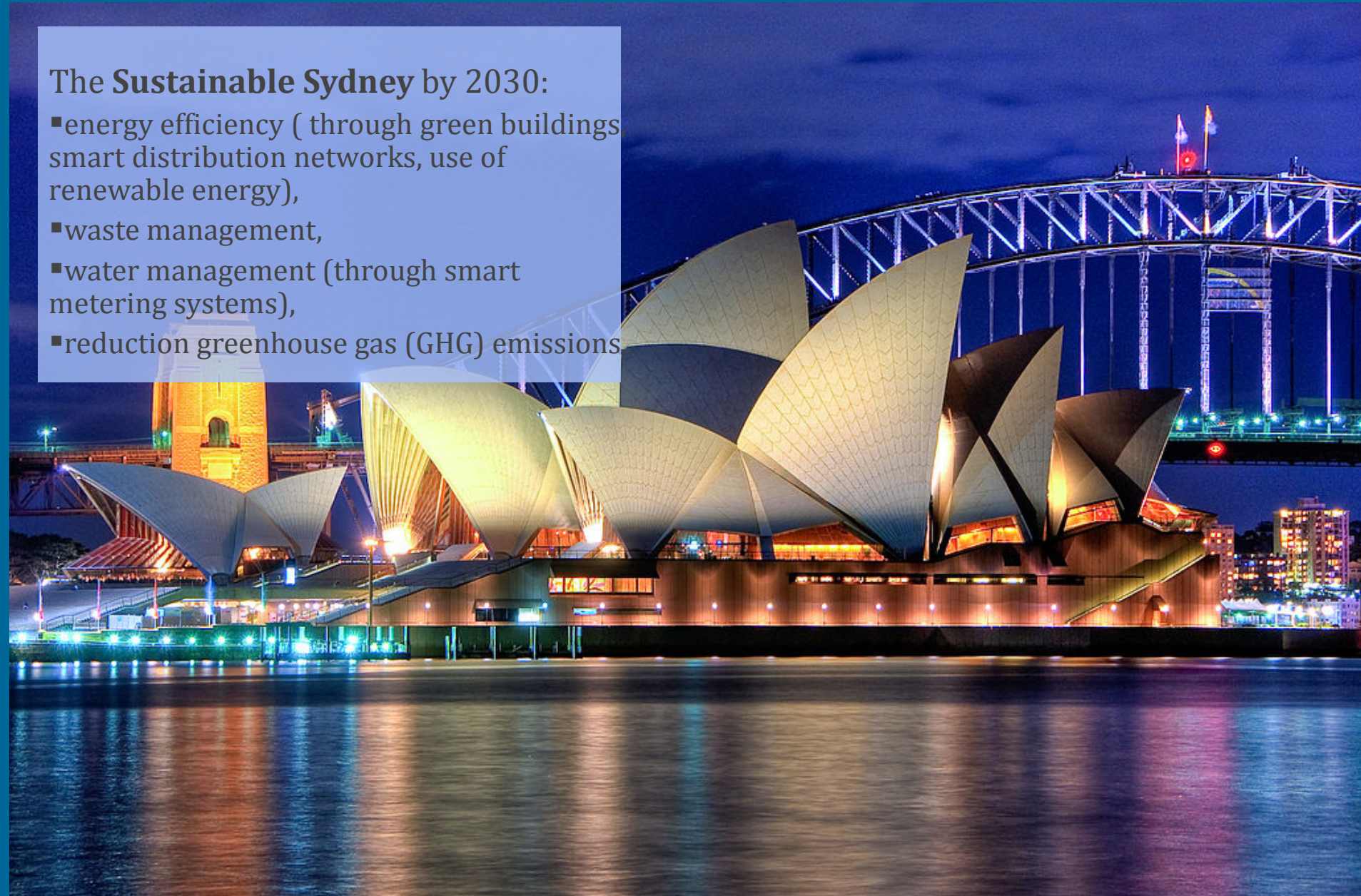
Yokohama, Japan

Yokohama Smart City Project (YSCP), launched in 2010:

- Implementing smart grids to reduce carbon dioxide emissions
- Introduction of renewable energy
- Settlement of 4,000 smart houses
- Installation of next-generation transportation systems

Seoul, South Korea

Smart City Seoul (SCS), 2015: launched in 2010:

- SCS is the No.1 on United Nations e-Government survey
- Reducing energy consumption
- Improving public awareness of smart city actions
- Improving public safety
- Improving water conservation

Wuhan, China

Smart City Wuhan by 2020:

- project to improve health initiatives (Mobile Hospital project) and e-governance (GIS-based Digital decision-making assistant system)

Hyderabad, India

Hyderabad International Financial Tec-City (HITEC) and **Jawaharlal Nehru Pharma city**:

- improving the city's transport sector, improving public safety and promoting smart SME projects within the city

Smart Sustainable Cities
The Challenges

Cyber-security:
The security can be compromise due to user errors, equipment failures, natural disasters as well as deliberate attacks.

High investments:
Establishing a network infrastructure along with sectorial needs is estimated to involve high levels of investment in SSCs.

No fixed framework:
Various existing frameworks to be followed.
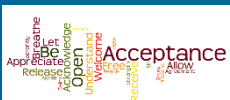**ITU aims to overcome this problem by developing a roadmap**

Engaging relevant stakeholders:
Stakeholder interaction is pertinent for the success of SSC initiatives.

Integration/Synergy of various sectors:
SSC initiatives to be based on holistic planning and not merely sectorial development.

Public acceptance:
Lack of awareness of the benefits of ongoing smart city initiatives leads to distrust among the general public.

Defining a Smart Sustainable City

"A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social and environmental aspects"
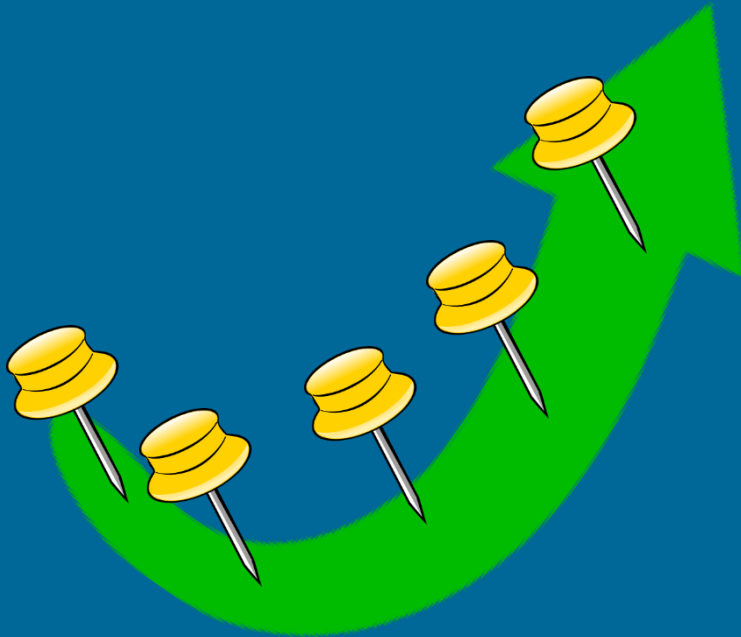
Focus Group on Smart Sustainable Cities

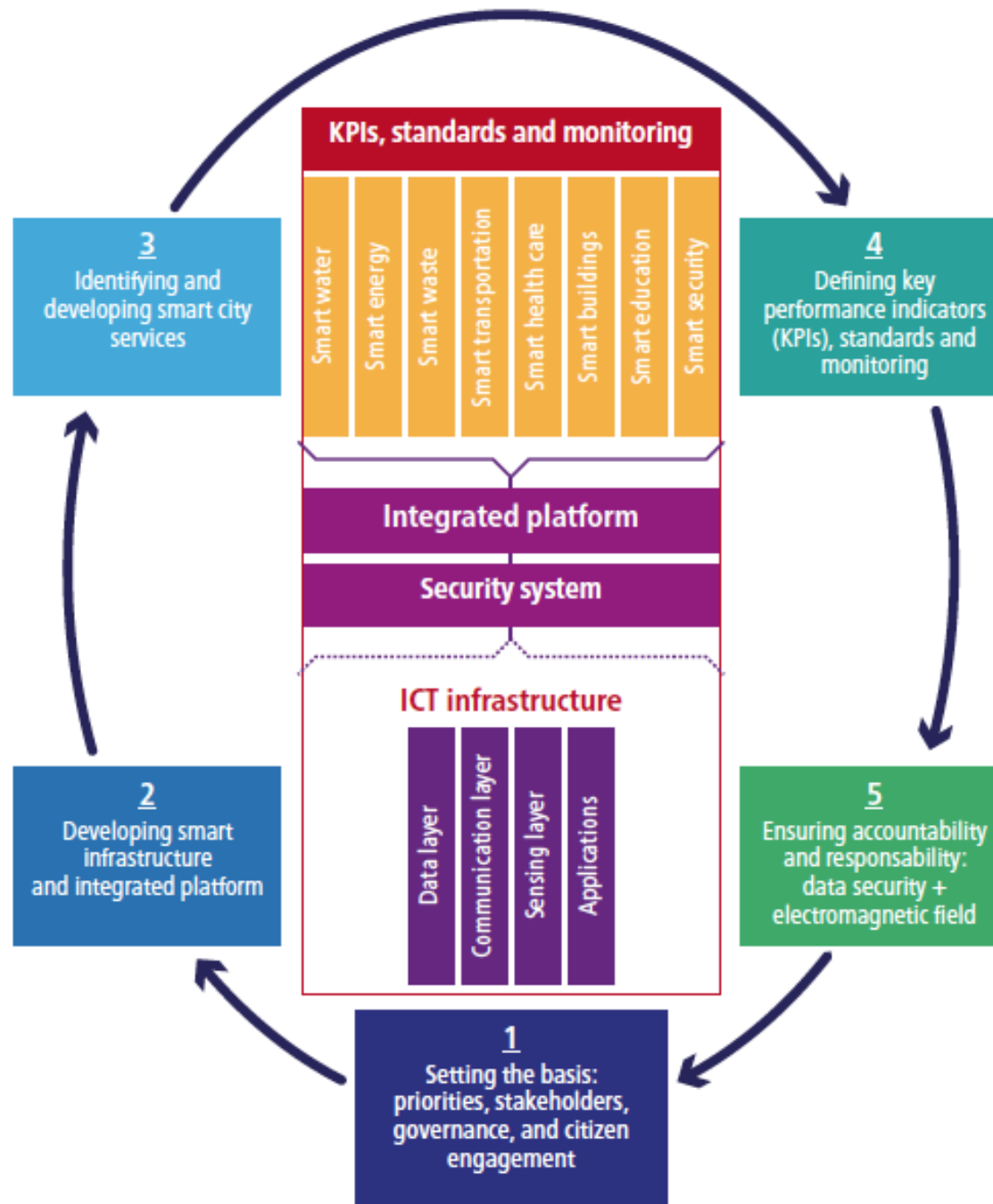# A roadmap for smart sustainable cities implementation

SSC

Scope:

- Re-thinking the way in which city infrastructure is built, services are offered, citizens are engaged, and systems linked;

- As general and inclusive as possible, **applicable to any city in the world**.

Objective:

- Informing the work of city decision makers to tackle the challenge of transforming their cities into SSC using ICTs.

A five-stage roadmap to action

Smart Sustainable City Architecture

Source: Technical Report on ICT Infrastructure for Cyber-Security, Data Protection & Resilience.
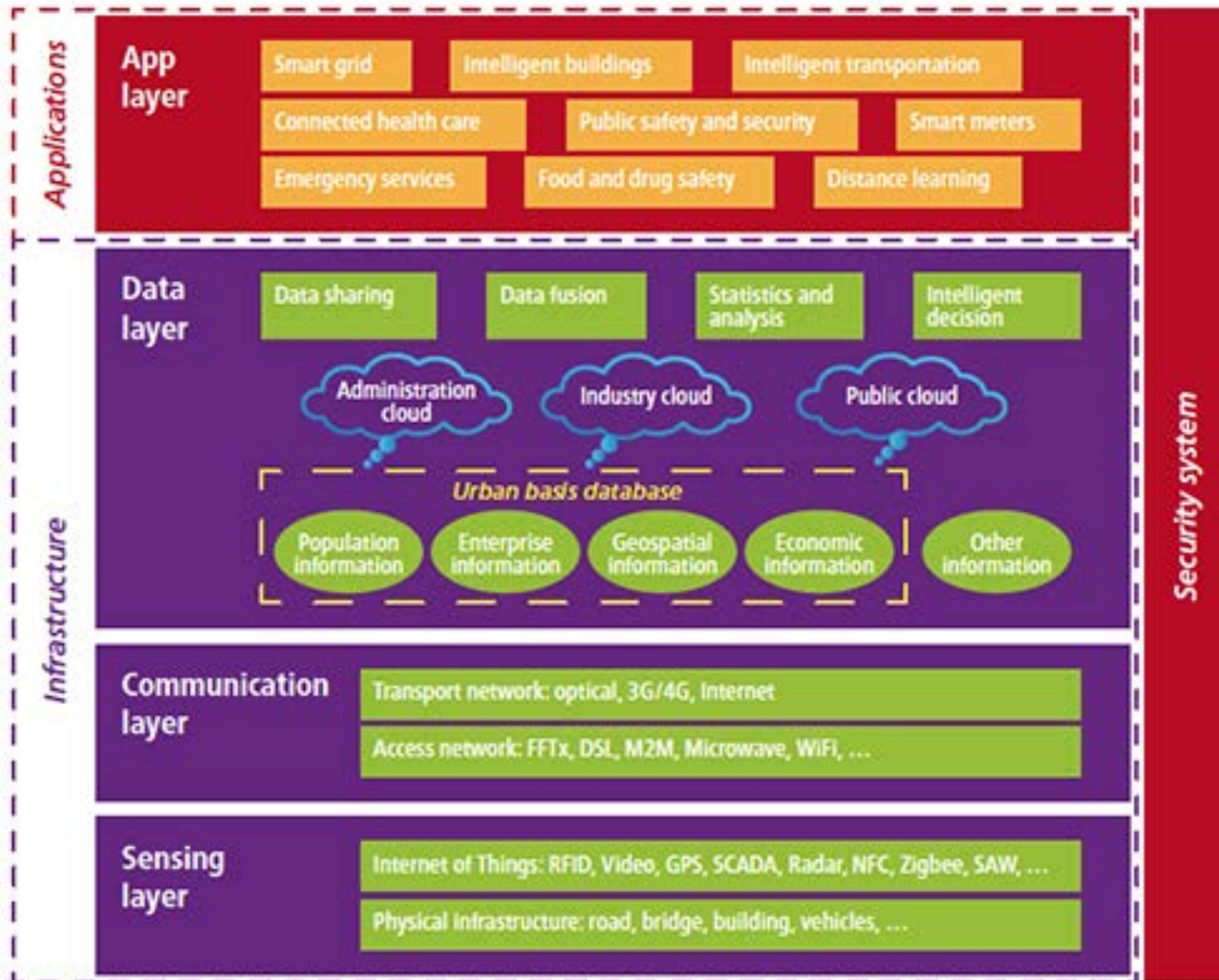
Engaging Stakeholders

Objective:
- To help stakeholders identify their roles in the development of the SSC and within SSC

SSC stakeholders:
- Municipalities and city administration (Including different departments).
- Urban Planners
- National and regional governments.
- City services companies and utility providers.
- ICT Companies (Telecom Operators, Start-ups, Software Companies)
- NGOs
- Multilateral Organizations
- Industry associations
- Academia and scientific community
- Citizens and citizen organizations
- Specialized Consulting Firms
- Standardization Bodies

Engaging Stakeholders
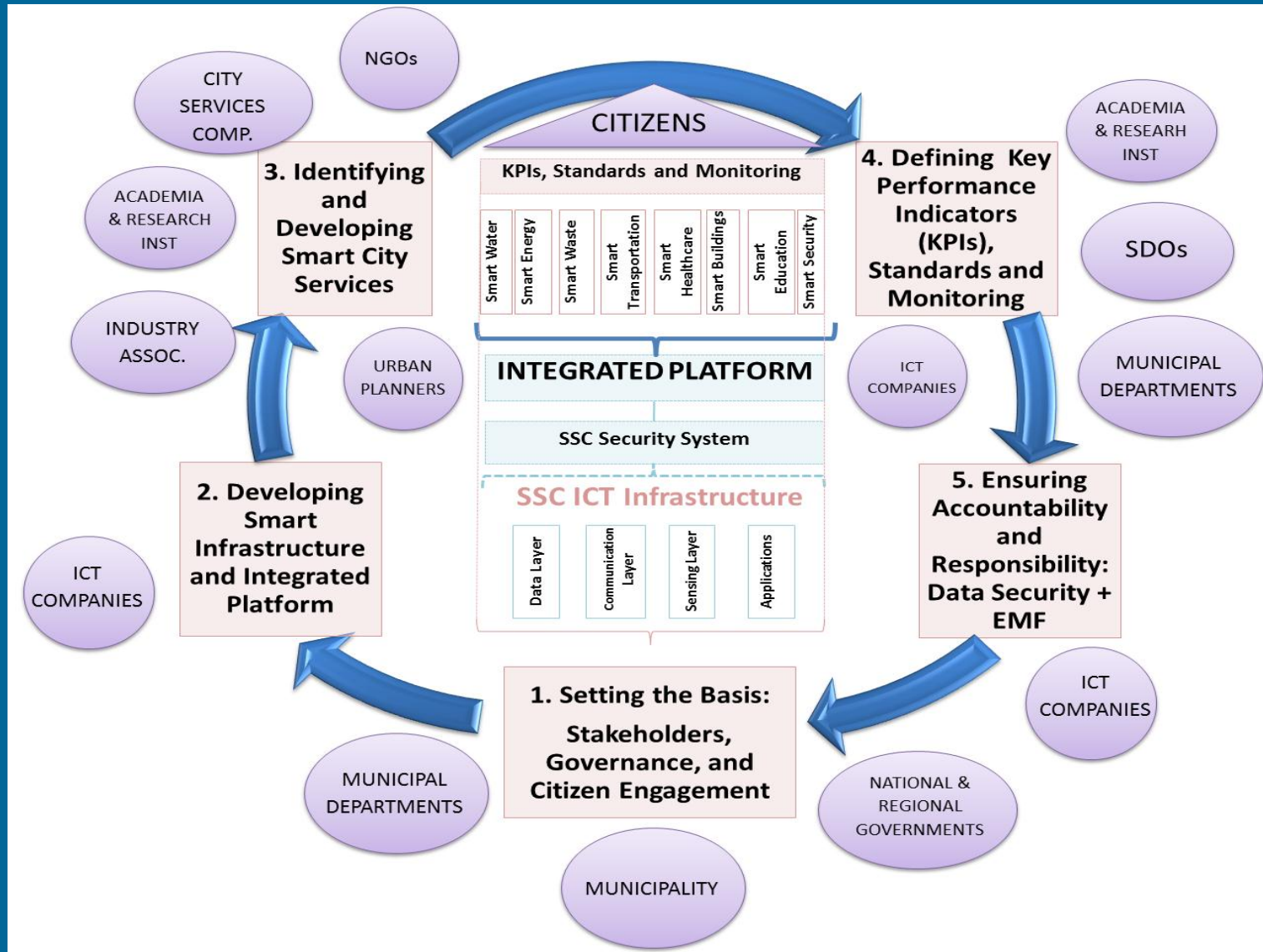
Paving the way to smart sustainable cities

Measuring success: need for suitable standardized measurement of progress of SSC to improve performance

Strategic partnership and knowledge sharing: foster interaction among all key stakeholders and promote expertise sharing

Technology access: bridge existing connectivity gaps and technological barriers

Environmental protection and sustainability: improve natural resources management

Funding: propose new business strategies by capitalizing on new economic growth

Raising awareness: engage all citizens

Suggestions for Policy makers

- Adopting the roadmap for SSCs developed by ITU.

- Studying the holistic/integrated approach adopted in smart city actions under successful initiatives.

- Introduction dynamic monitoring systems to ensure that the smart city projects are being implemented efficiently in a timely manner.

- Introducing policy as well as fiscal incentives for ICT based innovation and investment in smart city projects.

Suggestions for Policy makers

- Establishing an integrated platform within the city for exchange of ideas.

- Introducing a feed-back mechanism to get insights on how the smart city initiative is being received/perceived by the general public.

- Improving data security to dilute public prejudice/fear against ICT based systems.

Building smart sustainable cities

- Leading with vision to foster the design and implementation of SSC:
  - ➢ The role of international standards and policies is key to assess GHG emissions and energy consumption, move towards low-carbon, sustainable cities and foster adaptation and resilience to climate change;
  - ➢ International standards facilitate the integration of ICT into traditional infrastructure to turn it into smart infrastructure;
  - ➢ Standardized achievement can be multiplied worldwide across the whole industry.

- Engaging key stakeholders (such as municipalities, policy makers, academic and research institutes, civil society, NGOs, SDOs, ICT organizations, industry forums and consortia, international and regional organizations):
  - ➢ Smart sustainable city should be seen as a "System of Systems;
  - ➢ City leaders to align strategies and develop comprehensive policies;
  - ➢ City leaders to partner effectively with all city sectors, as well as with other levels of governments, ICT industry, NGOs, Universities, etc.

- Enabling a culture of innovation and collaboration:
  - ➢ ITU as global platform for the empowerment of smart sustainable cities;
  - ➢ Importance of raising awareness on the role of ICT as enabler of urban transformation.
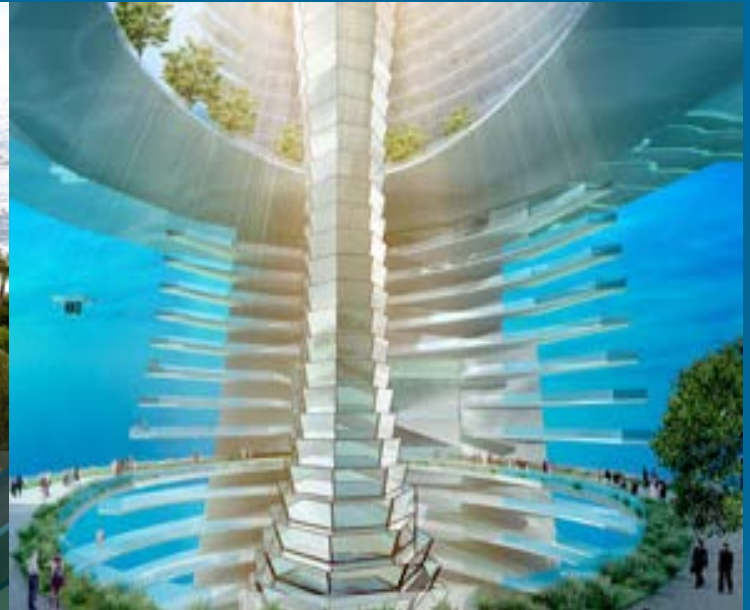
AT Design:
Floating future
cities

*"If your dreams don't scare you,
they're not big enough."*

Ellen Sirleaf

Additional information

- **ITU-T/SG5 "Environment & Climate Change"**
  itu.int/go/tsg5

- **ITU-T and Climate Change**
  itu.int/go/ITU-T/climate

THANK YOU!
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