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Smart Cities

Urbanisation, Environment and Infrastructure

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The first meeting of the EU-China Smart City Cooperation kicks off in Guangzhou at the end of May 2013. The objectives are to establish a Smart City expert group, which will undertake a series of joint activities such as collaboration on technical solutions, business models and public services in 10 pilot Smart Cities in both China and the EU. The expert group will conduct an assessment of the pilot cities and jointly issue a China-EU White Paper on a "Smart City cooperation model" in order to promote the model as a standard internationally.

This article provides a brief introduction to Smart Cities and why they are of key importance for both China and the EU.

What is a Smart City?

There are many definitions of a Smart City. However, common to all definitions is that they have a strong focus on making best use of information and communications technologies ("ICT") — to make the critical infrastructure components and services of a city — administration, education, health care, public safety, real estate, transportation and utilities — more interactive and efficient to enable social, cultural and urban development.

Why do we need Smart Cities?

- Increasing urbanisation: More than half of the world's nearly seven billion people now live in urban areas and that proportion is expected to reach almost 69 per cent by 2050, placing massive pressure on city infrastructures.
- *Impact on the environment:* Cities consume 75% of the world's energy resources and emit 80% of the carbon that is harming the environment.
- *Demands on infrastructure:* Increased urbanisation in cities has led to energy and water scarcity; traffic congestion: problems with waste disposal; and safety risks from ageing infrastructures.
- *Reduced budgets:* The economic climate is resulting in reduced public spending on the provision and management of public services.
- *Competition between cities:* Increased mobility of society has led to a competition between cities for investment, for talent, and for jobs.

The adoption of ICT solutions make cities more efficient, reduce costs, more sustainable and enhance quality of life.

Evolution of Smart Cities

Smart cities are not cities of the future as many of the technologies critical to a Smart City, including monitoring and sensor technologies, intelligent traffic systems, and energy management systems for buildings are available today.

Tianjin Eco-City

Image Source: www.tianjinecocity.gov.sg

The city of Guangzhou will host the first meeting of the Smart City project

There are examples of cities in both China (Dongtan; Tianjin eco-city; Tai Hu New Town, Wuxi;) and Europe (Amsterdam; PlanIT Valley, Portugal; Malaga, Spain) that are adopting a Smart City approach to the challenges of urbanisation.

Smart City projects can be "greenfield" i.e. The city is built from the ground up or "brownfield" where Smart City solutions are retrofitted into a city's existing infrastructure.

ICT and Smart Cities

The major ICT requirements for a Smart City are Internet technologies and services such as location-based services, the Internet of Things, trust and security platforms that work together across a common open platform. The two major building blocks of the ICT infrastructure are:

- An all-IP core network, which creates a converged infrastructure for buildings and ICT systems, and seamlessly integrates wireless and wire-line technologies.
- A broadband (fixed or wireless) access network, which can support advanced services and applications, such as traffic management, building automation, lighting and energy management, security etc.

ICT is usually applied to improve a mix of both public and private smart city services, such as:

- *Transportation:* Reducing traffic congestion and encouraging the use of public transport by making travel more efficient, secure, and safe.
- *Government Services:* Delivering new government services in an efficient way.
- *People:* Improving the quality and reducing the costs in education; increasing availability, accuracy in diagnosis and reducing the cost of health care; improving public safety by using real-time information to anticipate and responding rapidly to emergencies and threats.
- *Businesses:* Providing e-business solutions and ICT infrastructure for firms.
- *Resources:* Smart grid and renewable energy systems to manage outages, control costs, and deliver only as much energy or water as is required while reducing waste

The ICT infrastructure and services used to create a Smart City vary significantly from city to city. In general, "greenfield" cities typically require larger ICT projects because they usually involve new builds from scratch. Brownfield cities require an evolution/transformation of existing ICT infrastructure and services.

> *"The adoption of ICT solutions make cities more efficient, reduce costs, more sustainable and enhance quality of life."*

Smart City Challenges

Whilst there are many advantages of Smart Cities there are also some significant challenges:

- *Financial investment:* Smart City projects require a substantial financial investment, which is particularly difficult to do in today's global financial crisis.
- *Business Models:* To ensure the right level of financing is avail-

able Smart Cities need to adopt an effective business model. Some projects are externally funded through regional banks and investments funds that provide funding for public sector IT. Other projects are public-private partnerships where a vendor, service provider, systems integrators or a real-estate developer invests in the project on a revenue-sharing basis.

- *Complexity of how cities are operated, regulated, and planned:* The operation of a city is comprised of multiple stakeholders such as Government (e.g. Federal, State, Local, etc.); Regulators; Developers (e.g. Real estate, land, etc.); Owners (e.g. Real estate, transportation); Operators (e.g. Building services, utilities, Telco's, etc.) and Citizens. Smart City projects require consultation, cooperation and buy-in from all stakeholders.

- *Privacy and security:* Data collected from smart city services such as monitoring and measuring of energy, waste and water networks means that public value can be derived from private data. However, the data must be properly managed to protect citizens' privacy.

- *Technical issues:* Smart city services are likely to involve many different and complex ICT technology solutions. In addition, the immaturity of smart city services means that there are relatively few technical standards and hence there is a risk that smart city solutions deployed today may need to be replaced to make them interoperable with future systems.

Cities in both China and Europe will continue to face urban challenges into the foreseeable future and therefore there is a critical need to develop and implement strategies to make cities smarter.

We look forward to providing you with informative reports on the key outcomes from the EU-China Smart City Cooperation project.