



Smart Green City: Searching for definition and focusing on Framework Development and Strategies of Putrajaya

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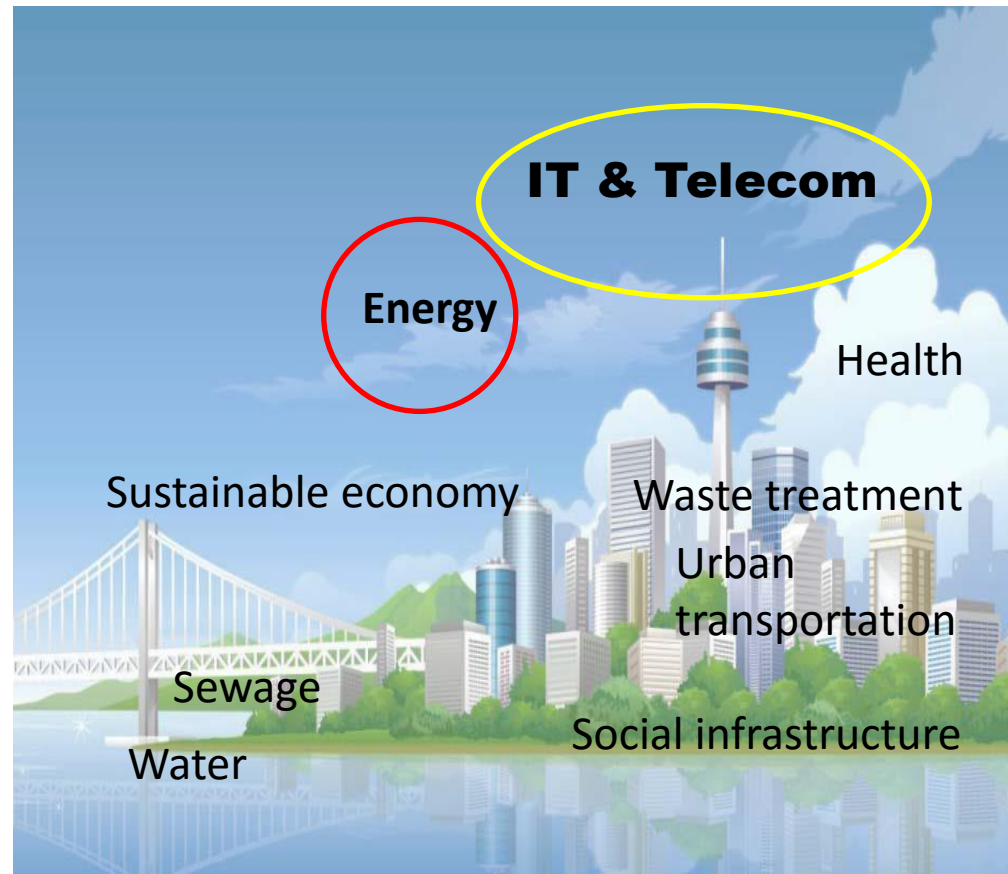
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Outline of presentation

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- What is a smart city? Why Green Smart City :Some fact about Putrajaya
- Case studies of smart green city initiatives
- The opportunity and the challenge



Focus of discussion

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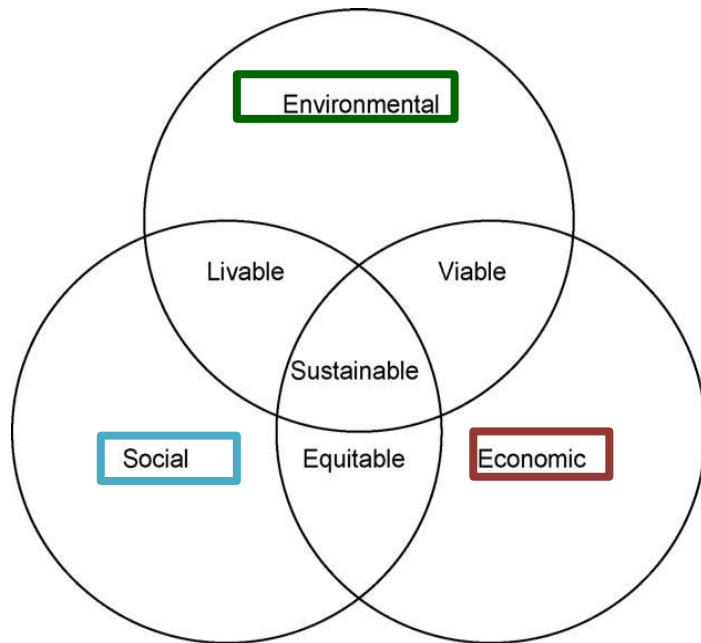
This paper discusses on the potential for Putrajaya becoming a smart green city. It discusses Putrajaya as a smart city status and looking at the city's effort towards becoming itself smart green.



The Sustainable Development Concept

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“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (WCED, 1987)



- Brundtland Report's three aspects *economy*, *social* and *environment* have now been fortified with the *institutional* dimension (see European Parliament, 2012).
- To achieve Sustainable development, all qualities associated with the four dimensions must be integrated in developments.
- Thus, development must be **equitable** (economic+social), **livable** (environment+social) and **viable** (economic + environment).

Source: Brundtland Report (1991)

City development concepts

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- A city, like any other organism, evolves/changes over time, adapting itself to satisfy human needs.
- As a dynamic complex system, a city is characterized by
 - interdependences (between human-made, natural, social capital, *etc.*)
 - circular processes (which stimulate creativity)
 - synergies (which increase the resilience capacity).
- Among the prominent city development concepts : ***Sustainable Cities, Green Cities, Garden Cities, Liveable Cities***, and ***Smart Cities***.

Our perspective: cities need to be Smart and Green

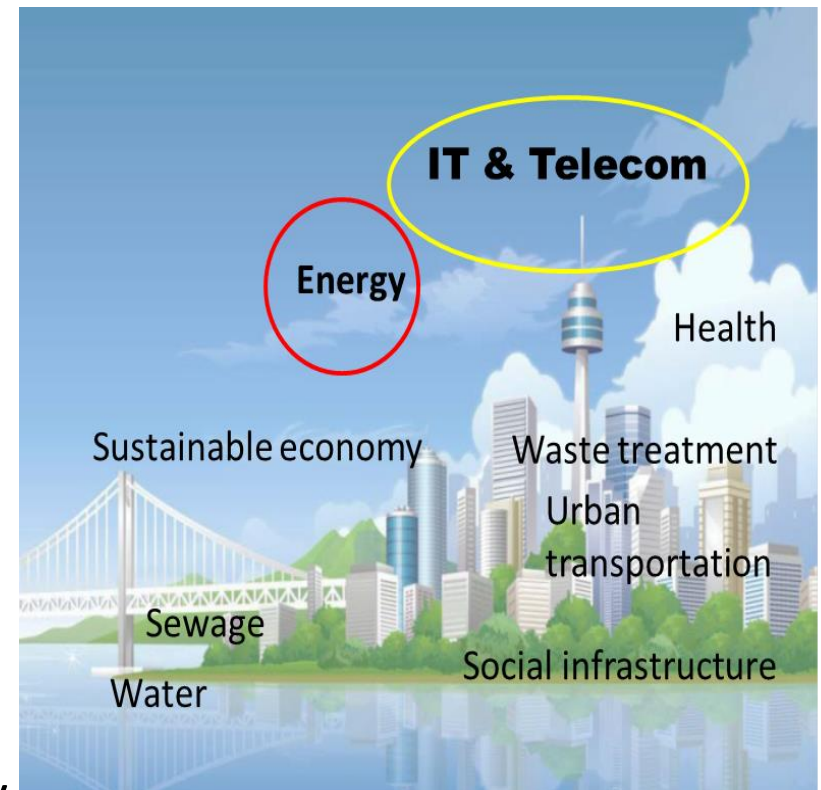
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Better management of energy supply and demand resources to meet utility and city goals

Integration of:

- Smart grid technology
- Energy efficiency
- Distributed generation
- Solar PV/thermal
- Smart appliances
- Home area networks/displays
- Electric vehicles/charging
- Smart street lighting
- Micro-grids
- Technologies that increase resiliency

The Smart Green City



Smart Cities Dimensions by Giffenger et.al (2007)

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AGREED DIMENSIONS

List of Smart City dimensions and factors

SMART ECONOMY (Competitiveness)

- Innovative spirit
- Entrepreneurship
- Economic image & trademarks
- Productivity
- Flexibility of labour market
- International embeddedness
- Ability to transform

SMART PEOPLE (Social and Human)

- Level of qualification
- Affinity to lifelong learning
- Social and ethnic plurality
- Flexibility
- Creativity
- Cosmopolitanism/Open-mindedness
- Participation in public life

SMART GOVERNANCE (Participation)

- Participation in decision-making
- Public and social services
- Transparent governance
- Political strategies & perspectives

SMART MOBILITY (Transport and ICT)

- Local accessibility
- (Inter-)national accessibility
- Availability of ICT-infrastructure
- Sustainable, innovative and safe transport systems

SMART ENVIRONMENT (Natural resources)

- *Lack of pollution of natural conditions*
- *Pollution*
- *Environmental protection*
- *Sustainable resource management*

SMART LIVING (Quality of life)

- Cultural facilities
- Health conditions
- Individual safety
- Housing quality
- Education facilities
- Touristic
- Social cohesion

Source: Adapted from Giffenger et al. (2007)

Barriers to Smart Green City investment

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FEW OBSERVATION AND OPINION :

“Transformation into a Smart City:
*“Everyone sees it as important,
nobody knows what to do.”*”

Staff resistance to transition to web,
digital formats is a major factor

*No department uses the same
databases*

Change requires political leadership

Digitization happens
department by department

- Lack of vibrancy in Putrajaya by investment resources
- Lack of cultural, economic, social and intellectual development within the city
- Assessment of Smart Green City concept in planning and operation moving towards sustainability.
- Whether the concept is appropriate and what improvements can be made to turn Putrajaya as a **Smart Green City**????

CASE STUDY

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Putrajaya's original ideals were as:

- A well-planned modern city based on the concept of **sustainable and intelligent development**.
- A city that reflects the rich **cultural and natural heritage**.
- A federal government **administrative centre** with the capacity and amenities to meet the challenges of the next millennium



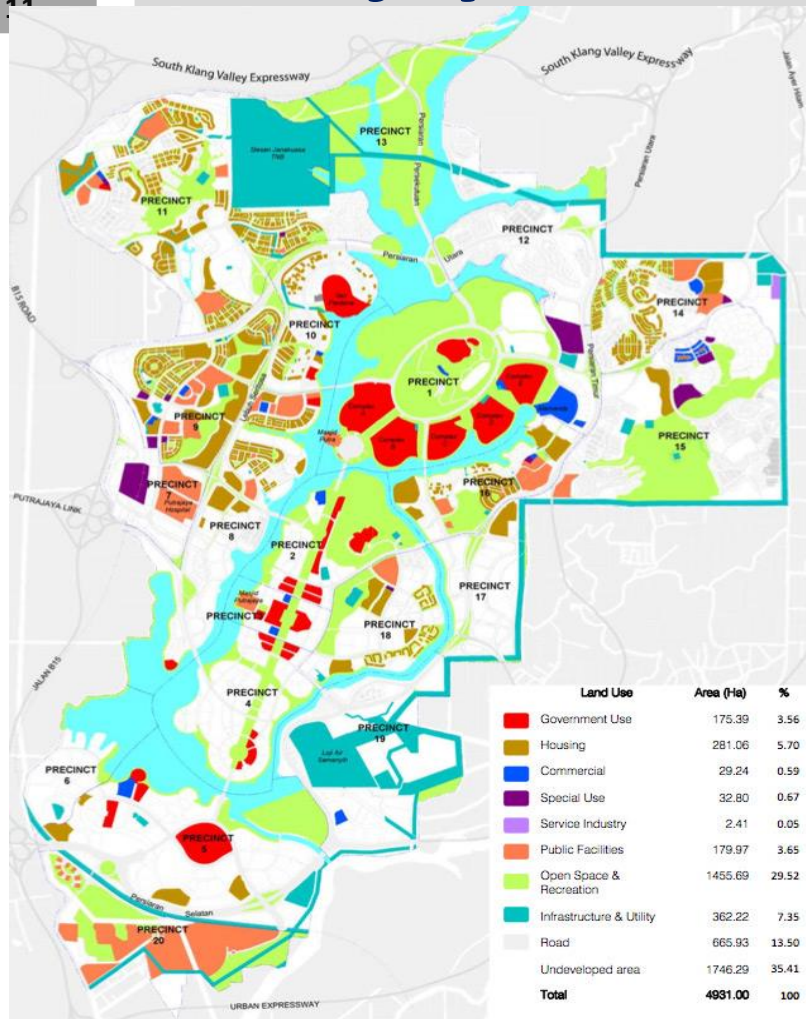
Putrajaya's original ideals were as: (cont'd)

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- A conducive residential, commercial and recreational environment where people can enjoy a **high quality of life**.
- A city where **local resources and materials** are employed in the development.
- A **showcase of Malaysia's expertise** in the management, planning, design, construction and maintenance of large-scale urban development project.



Putrajaya Master Plan 1995



- Putrajaya Master Plan was approved in 1995
 - 40% designated open space.
 - 400 ha man-made lake & 200 ha of wetlands.
 - Public and private transport provision is based on 70:30 ratio.
 - 20 precincts, with CBD area at the core island surrounded by man-made names and residential use at the periphery.
 - Projected population is 330,000 with 67,000 housing units.

Putrajaya Structure Plan 2025

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- The current Structure Plan for Putrajaya envisions the city to be transformed from **Garden City concept** to **Green City concept**.
- The Green City concept will see a shift of focus on ensuring its built and natural environment co-exist and undertaking initiatives towards reduction in carbon emission from its urban activities.

Structure Plan : Sustainable Putrajaya 2025



a statutory plan prepared under Act 712 has incorporated a vision, directions and policies that will set the path towards transforming Putrajaya from a garden city into a green city

Current Status of Development for Major Components

Component	Planned (2025)	Current (2015)
Areas	4,931 hectares	4,931 hectares
Population	347,700	82,200 people (Department of Statistics, 2014)
Housing	62,192 units <ul style="list-style-type: none"> • 51% (government quarters) • 36% (private housing) • 1.3% (affordable housing) 	65,857 units <ul style="list-style-type: none"> • Completed = 22, 589 units (43.9%) <ul style="list-style-type: none"> ➤ 22,452 (75% government quarters) ➤ 5,137 (20% private housing) ➤ 2,538 (9% affordable housing) ➤ 0/12,954 (0% PPA1M) • Under construction = 8,983 units (6,672 units PPA1M)
Government Use	2.75 million sq m	<ul style="list-style-type: none"> • Completed – 2.41 mil sq m (86%) • Under construction = 341,800 sq m 22 ministries moved to Putrajaya
		Govt Employees (67,246 (HRMIS, 2014))
Commercial	4.25 mil sq m	Completed = 688,632 sq m (21%) Under construction = 398,736 sqm
Open Space (including Lake & Wetland)	1,918.66 hectare (38.9%)	1,802.35 hectare (36.6%)

Source: City Planning Department, Putrajaya Corporation (January 2015)

Smart green initiatives :Matching actions to smart environment dimension:

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Factors	Indicators	Programmes
Lack of pollution of natural conditions (Giffinger, 2007)	<ul style="list-style-type: none"> The Green Lung of Putrajaya 	<ul style="list-style-type: none"> One million Tree Planting Program Tree Planting Programme in Conjunction with the Million of Youth Green Finger Programme Putrajaya Urban Farming Programme
	<ul style="list-style-type: none"> Greening Programmes 	<ul style="list-style-type: none"> Pilot Project on Trees Inventory and Management System Greening the Earth Planting Programme



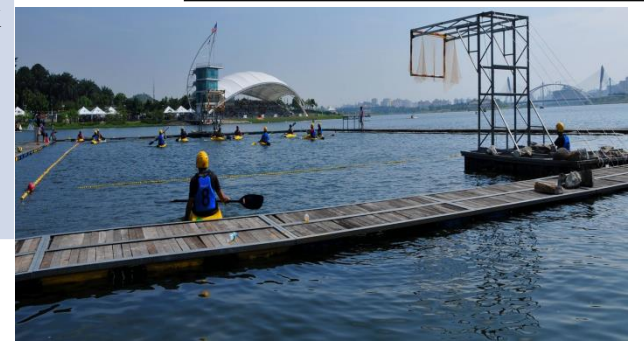
Smart green initiatives: Matching actions to smart environment dimension:

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Factors	Indicators	Programmes
Environmental protection (Giffinger, 2007;	Programs introduce for natural protection	<ol style="list-style-type: none"> 1) Lakeside yearly festivals 2) Low carbon city initiatives 3) Putrajaya Environmental Management Programme 4) Intergrated Management of Lake and Wetland 5) Environment Ecosystem Educational Programme (3EP) 6) Healthy Community Healthy Ecosystem 7) Program 3R (reuse, reduce & recycle) 8) Permanent Recycling Centres (buy back centre-BBC) 8) Central District Cooling Plant



Phragmites karka



Smart green initiatives: Matching actions to smart environment dimension:

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Factors	Indicators	Programmes
Pollution Control (Giffinger, 2007)	Particulate matter	<ol style="list-style-type: none"> 1) Bicycle share programme 2) Mobile recycling centres- MRC 3) Kerbside Programme (house-to-house collection) 4) Food Waste and Garden Waste Composting Programme 5) Innovative of Reuse Solid Waste 6) Biodegradable Plastic Bas Campaign at Putrajaya Mega Farmer's Market 7) Facilities in Residential Apartment 8) Recycling facilities at Office Complexes 9) Used Cooking Oil Collection Programme



Smart green initiatives :Matching actions to smart environment dimension

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Factors	Indicators	Programmes
Sustainable resource management (Giffinger, 2007)	Efficient use of water (use per GDP)	1) Lake Water Quality Control Using Floating Aquatic Plants
		2) Putrajaya Lake Awareness Programme
		3) Lake and Wetland Eco-hydrology Appreciation Exhibition
		4) National World Water Day Celebration
		5) National World Ocean Day Celebration
		6) National Young Leader “Care for Water” Camp (Central Zone)



Matching actions to smart environment dimension:

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Factors	Indicators	Programmes
Sustainable resource management (Giffinger, 2007)	Efficient use of electricity (use per GDP)	1) Lighting Master Plan of Putrajaya- Using of LED Lights
		2) Putrajaya lighting Festival
		3) Retrofitting of Putrajaya Corporation Building complex
		4) The Use of BIPV system in residential buildings and offices
		5) Proposed Construction of 5 MW Solar Power Station
		6) Park lighting with solar-wind hybrid system (Pilot Project)
		7) Installation of solar panel to the lights in the bus stop (Pilot Project)
		<p>Green buildings:</p> <ul style="list-style-type: none"> Energy Commission Diamond buildings- Green Building Index (GBI)



Challenges and Opportunities

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- **Gateway versus Roadblocks**
 - Most smart green projects begin on its own– that's OK in the beginning !
 - So long there is long tem planning AND
 - A Smart Green City should works through collaboration between departments
- **Coordinated planning results in greater efficiencies and benefits**
 - Existing Master Plan but require greater operational efficiencies
 - Better customer engagement
 - Manage community roll-out of smart cities technologies
- **Smart Green City Planning Activities**
 - Putrajaya Corporation has initiated a preliminary assesment of needs, but further research on resources and risks.
 - Already developed a preliminary data inventory on buildings, energy use, etc,(LCCF) **BUT** requires integrated and coordinated implementation plan.



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