



GLOBAL SMART SUSTAINABLE CITY INDEX (SSC INDEX) – FIRST DRAFT

THE GLOBAL CITY RANKING



PRESENTED BY:

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MALAGA, 26 APRIL 2018

PREPARATION OF THE SSC INDEX – FIRST DRAFT

- **This SSC INDEX is being developed under a cooperation agreement between ITU and Smart Dubai**
- **The SSC INDEX is based on the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC) which were developed with the input from 16 UN Agencies, Dubai and other 50 cities under the framework of the U4SSC Initiative.**
- **The U4SSC KPIs are based on Recommendation ITU-T Y.4903/L.1603: Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals.**
- **The SSC INDEX is being developed by Barbara Kolm (Austrian Economics Center) and John Smiciklas (U4SSC Auditor) as part of an ITU Project led by Cristina Bueti.**
- **The development of the SSC INDEX, is based on feedback gathered from the pilot testing of the U4SSC KPIs which are being implemented in over 50 cities worldwide.**
- Input is being also gathered from other external researchers and scientists from Universities, Institutes and Think Tanks from different fields of research e.g. political and social science, economics, institutional economics, sociology, mathematics, statistics, computer science, philosophy, city planners, architects, environmentalists etc.
- In addition to the inputs from the experts in Dubai and experts from many UN Agencies, additional input is being gathered from other experts including: Maria Blanco (San Pablo CEU University), John Chisholm (MIT, Alumni President), Nobel Laureate Edmund Phelps (Columbia University), Peter Jungen (Institute for New Economic Thinking), Nobel Laureate Vernon Smith (Chapman University), Dambisa Moyo (Independent), Hartwig Schafer (World Bank), Razeen Sally (National University of Singapore), Robert Lawson (Southern Methodist University, Dallas), Enrico Colombatto (University of Torino), Hannes Gisruarson (University of Iceland), Richard Rahn (Institute for Global Economic Growth), Enrique Gherzi (University of Lima), Deirdre McCloskey (University of Illinois at Chicago), Krassen Stanchev (University of Sofia), Prince Michael of Liechtenstein (GIS, Geopolitical Intelligence Services, Liechtenstein); Christian Bjornskov (Aarhus University)...

CONTENT

- Framework
- Why SSC INDEX
- SSC INDEX Solutions
- Basis for the SSC INDEX: KPIs and SDGs
- Benefits for Cities participating in SSC INDEX

FRAMEWORK I

- According to the definition developed by UNECE and ITU:
 - “A Smart Sustainable City is an innovative city that uses ICTs and other means to improve quality of life, efficiency of urban operations and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects.”
- The base for the SSC INDEX are the U4SSC KPIs.
- The SSC INDEX is an evidence-based global city ranking.
- Additional key data points are included by international scientists.

FRAMEWORK II

- The SSC INDEX consists of measurements in the sectors of smartness, sustainability, environment and economy.
- The result is a state-of-the-art, largely intervention-robust composite index which reflects approximately all quality dimensions of living, working, and producing in the world's leading cities under the perspective of sustainability and smartness.
- Above all, in order to make cities comparable, all sets of indicators and data are referenced and differentiated to:
 - Size of cities
 - Geographic location
 - Economic integration

WHY A SSC INDEX? II

- There is a need to measure progress.
- There is a need to make different levels of economic integration, geographic location sizes of cities transparent.
- There is a need to evaluate and integrate different levels of quantitative and qualitative data.
- There is a need to make these data comparable and visible with state of the art scientific methods.
- There is a need to transform/translate scientific outcomes into easy understandable graphics and numbers.
- There is a need to make outcomes/results public for users (citizens, governments etc.).

PHASES UNDERTAKEN TO CONSTRUCT THE SSC INDEX



SSC INDEX SOLUTIONS I

- The SSC Index sets new standards to compare cities.
- The SSC Index is the first international set of coherent metrics.
- The SSC Index uniquely coordinates data input from all international resources (e.g. UN Statistical Division, World Bank, OECD etc.) and the evaluated KPI city data with its state of the art scientific methods.
- The SSC Index benchmarks the cities' contribution to sustainability and smartness as well as their ongoing efforts to implement SDGs.
- The SSC Index is a highly useful tool for any city to improve, advance and further develop its performance related to society, economy and environment.
- The SSC Index allows cities to learn from each other in a transparent way.

THE SSC INDEX WILL ASSIST IN THE ACHIEVEMENT OF THE SUSTAINABLE DEVELOPMENT GOALS

“A Smart Sustainable City is an innovative city that uses ICTs and other means to improve quality of life, efficiency of urban operations and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects.”



SUSTAINABLE DEVELOPMENT GOALS

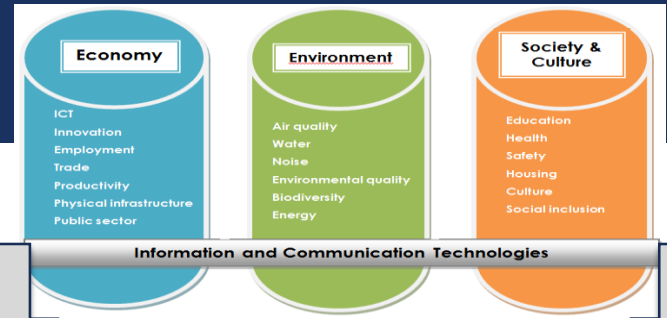


BASIS FOR THE SSC INDEX: U4SSC KPIs

Additional KPIs have been added to create additional added value and allow to constantly improve, adapt and advance the SSC INDEX

Economy						
Reporting and Verified						
Core Indicators		22	of 23			
Advanced Indicators		30	of 31			
KPI N°	Type	Description		Data Reported	Data Verified	
1	EC: ICT: ICT: 1C	Core	Percentage of households with Internet access	#DIV/0!	Percentage	Yes
2	EC: ICT: ICT: 2C	Core	Percentage of households with fixed (wired) broadband.	#DIV/0!	Percentage	Yes
3	EC: ICT: ICT: 3C	Core	Wireless broadband subscriptions per 100 000 inhabitants.	#DIV/0!	Number / 100 000 inhabitants	Yes
4	EC: ICT: ICT: 4C	Core	Percentage of the city served by wireless broadband - 3G	#DIV/0!	Percentage	Yes
5	EC: ICT: ICT: 4C	Core	Percentage of the city served by wireless broadband - 4G	#DIV/0!	Percentage	Yes
6	EC: ICT: ICT: 5C	Core	Number of public WIFI hotspots in the city	0	Number	Yes
7	EC: ICT: WS: 1C	Core	Percentage implementation of smart water meters.	#DIV/0!	Percentage	Yes
8	EC: ICT: WS: 2A	Advanced	Percentage of the water distribution system monitored by ICT	#DIV/0!	Percentage	Yes
9	EC: ICT: D: 1A	Advanced	Percentage of drainage / storm water system monitored by ICT	#DIV/0!	Percentage	Yes
10	EC: ICT: ES: 1C	Core	Percentage implementation of smart electricity meters.	#DIV/0!	Percentage	Yes
11	EC: ICT: ES: 2A	Advanced	Percentage of electricity supply system monitored by ICT	#DIV/0!	Percentage	Yes
12	EC: ICT: ES: 3A	Advanced	Percentage of electricity customers with demand response capabilities	#DIV/0!	Percentage	Yes
13	EC: ICT: T: 1C	Advanced	Percentage of urban public transport stops with dynamically available information	#DIV/0!	Percentage	Yes
14	EC: ICT: T: 2C	Advanced	Percentage of major streets monitored by ICT	#DIV/0!	Percentage	Yes
15	EC: ICT: T: 3A	Advanced	Percentage of road intersections using adaptive traffic contro	#DIV/0!	Percentage	No
16	EC: ICT: PS: 1A	Advanced	Percentage and number of inventoried datasets that are published	#DIV/0!	Percentage and Number	Yes
17	EC: ICT: PS: 2A	Advanced	Number of public services delivered through electronic means	0	Number	Yes
18	EC: ICT: PS: 3A	Advanced	Percentage of public sector procurement activities that are conducted electronically	#DIV/0!	Percentage	Yes
19	EC: P: IN: 1C	Core	Research and Development expenditure as a percentage of city GDP	#DIV/0!	Percentage	Yes
20	EC: P: IN: 2C	Core	Number of new patents granted per 100 000 inhabitants per year	#DIV/0!	Number /100 000 inhabitants	Yes
21	EC: P: IN: 3A	Advanced	Percentage of small and medium-sized enterprises (SMEs)	#DIV/0!	Percentage	Yes
22	EC: P: EM: 1C	Core	Percentage Unemployed	#DIV/0!	Percentage	Yes
23	EC: P: EM: 2C	Core	Percentage Youth Unemployed	#DIV/0!	Percentage	Yes
24	EC: P: EM: 3C	Advanced	Percentage of the labour force working in the tourism industry	#DIV/0!	Percentage	Yes
25	EC: P: EM: 4C	Advanced	Percentage of the labour force working in the ICT industry	#DIV/0!	Percentage	Yes
26	EC: I: WS: 1C	Core	Percentage of households with access to a basic water supply	#DIV/0!	Percentage	Yes
27	EC: I: WS: 2C	Core	Percentage of households with potable water supply	#DIV/0!	Percentage	Yes
28	EC: I: WS: 3C	Core	Percentage of water loss in the water distribution system.	#DIV/0!	Percentage	No
29	EC: I: WS: 4C	Core	Percentage of households served by wastewater collection	#DIV/0!	Percentage	Yes
30	EC: I: WS: 5C	Core	Percentage of households with access to basic sanitation facilities	#DIV/0!	Percentage	Yes
31	EC: I: WA: 1C	Core	Percentage of households with regular solid waste collection.	#DIV/0!	Percentage	Yes
32	EC: I: ES: 1C	Core	Average number of electrical interruptions per customer per year	#DIV/0!	Number	Yes
33	EC: I: ES: 2C	Core	Average length of electrical interruptions	#DIV/0!	Minutes	Yes
34	EC: I: ES: 3C	Core	Percentage of households with authorized access to electricity	#DIV/0!	Percentage	Yes
35	EC: I: T: 1C	Core	Length of public transit network per 100 000 inhabitants	#DIV/0!	Kilometers/ 100,000 inhabitants	Yes
36	EC: I: T: 2A	Advanced	Percentage of the population that has convenient access (within 0.5 km) to public transit	#DIV/0!	Percentage	Yes
37	EC: I: T: 3C	Core	Length of bicycle paths and lanes per 100 000 population	#DIV/0!	Kilometers/ 100 000 inhabitants	Yes

SSC INDEX



KPIs

UN Statistics Data
IMF Data
World Bank Data
OECD Data

U4SSC-Methodology
„Black Box“

Results

Analysis in conjunction with additional data points that provide a better description of the city
e.g.
Population
Households
Gender Ratio
City Expenditures



Imputed by respective city; evaluated by ITU

Scientists add data which are treated with different methods:
Positive Orientation
Standardization

Composite Indicator Results
e.g. Heat Map or 3-D Visualization



THE SMART AND SUSTAINABLE CITY UNIVERSE WORK COMPLETED

THE COMPOSITE SSC INDEX TO RANK CITIES

What is in „THE INDEX METHOD BOX“?

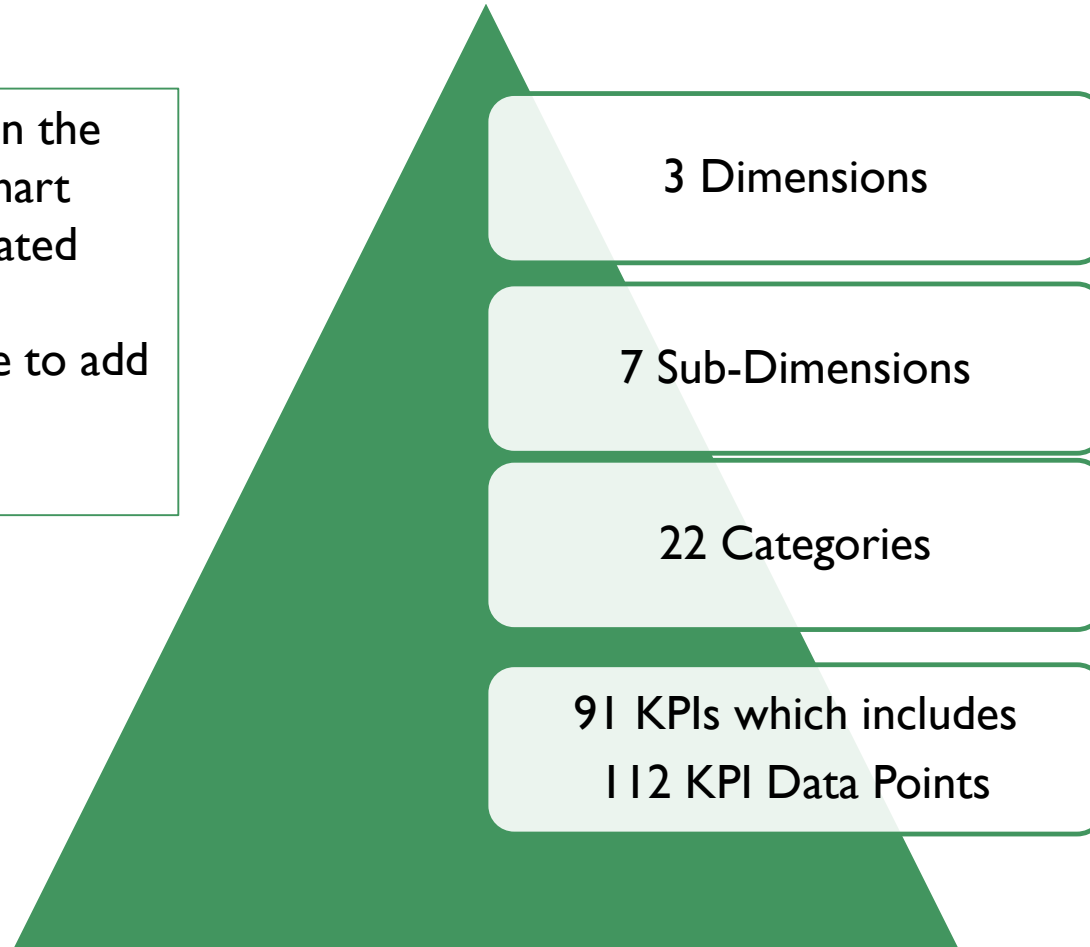
The following slides FAQs are answered and the state-of-the-art scientific method, statistic and mathematic tools that lie behind the visible graphics and results is described; those are based on the methodology of our innovative regional benchmarking, which has been carried out since 2005 continuously for 75 European regions;

in collaboration with international experts we have built the SCC INDEX to identify performance, top priority areas and targeting existing gaps and deficiencies and make them visible and easy to understand.

Variable Selection

Smart Sustainable City Key Performance Indicators

The variables are selected based on the Key Performance Indicators for Smart Sustainable Cities and fed/interpolated into the System.
For cities there will be an interface to add data.



Each KPI is located in one of the Top-3 key performance indicators structure levels. 54 Core Indicators + 37 advanced Indicators; 20 Smart + 32 Structural + 39 Sustainable

BASIS SSC INDEX?

- The data is collected from the cities directly. Any city has the possibility to upload their data on the SSC Index Website which is being developed by ITU.
- The composite indices are structured according to KPIs that fall within sub-categories, Economic, Environmental and Socio-cultural variables. Example:



BASIS SSC INDEX?

- The Methodology used for SSC INDEX considers clustering mechanism which will classify cities according to their size, (both geographic and population), geographical location.
- By applying clustering, cities are classified according to their similarities regarding economic integration, population size and geographical locations.
- Example: clustering finds those cities which are similar based on determined criteria (size, location, etc) and allows to group cities with similar socio-economic characteristics. The method follows the rule “do not compare apples with oranges”.

ADVANTAGES OF KPI AND SSC INDEX

- SSC KPIs are designed according to a methodology will help rank cities according to quality dimensions of living, working and producing in leading cities.
- Proposed combining of several concepts such as economy, environment culture and society, quality of life, and government succeeds in capturing complex multidimensional realities with a view to supporting decision makers and stakeholders.
- The proposed SSC INDEX model can also assess progress over time and allows users to compare complex dimensions over time. The robustness tests that are built into the final calculations make it reliable for intertemporal analysis.
- SSC INDEX methods that are proposed can assure that the indicators are normalized over an identical range.
- Cities would be clustered and compared against similar cities

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