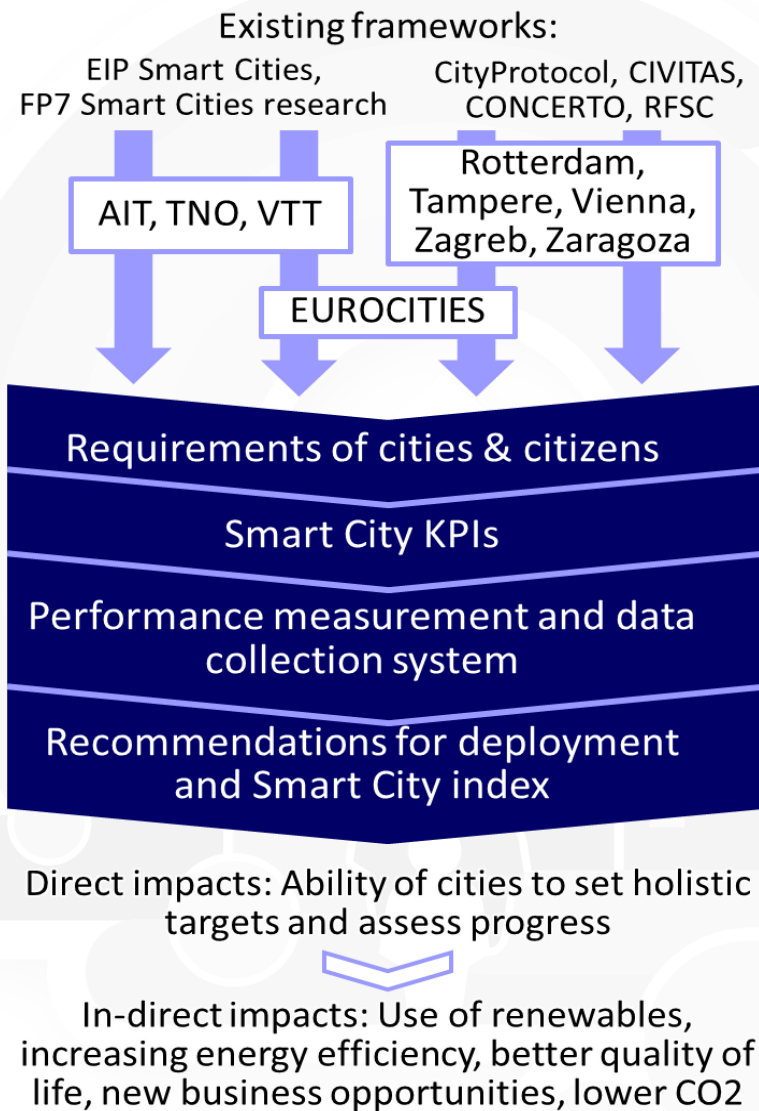# CITYkeys

Prof. Miimu Airaksinen, VTT

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CITYkeys

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CITYkeys overview

The goal of CITYkeys is to provide a validated, holistic performance measurement framework for monitoring and comparing the implementation of Smart City solutions.

Existing frameworks:

EIP Smart Cities, FP7 Smart Cities research

CityProtocol, CIVITAS, CONCERTO, RFSC

AIT, TNO, VTT

Rotterdam, Tampere, Vienna, Zagreb, Zaragoza

EUROCITIES

Requirements of cities & citizens

Smart City KPIs

Performance measurement and data collection system

Recommendations for deployment and Smart City index

Direct impacts: Ability of cities to set holistic targets and assess progress

In-direct impacts: Use of renewables, increasing energy efficiency, better quality of life, new business opportunities, lower CO_2

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Cities and citizens needs

Mapping existing frameworks

European Initiatives
1 - Concerto
2 - Smart City Information System (in development)
3 - Civitas
4 - Green Digital Charter
5 - RFSC Reference framework for sustainable cities
6 - Covenant of Mayors
7 - European Smart City Index

International and European Standards
1 - ISO 37120 Sustainable Development of Communities
2 - ISO 37151
3 - ITU FG-SSC

Neighborhood Certification Schemes
1 - DGNB / OEGNI for urban districts
2 - BREEAM Communities
3 - LEED v4 for Neighborhood Development
4 - CASBEE Cities
5 - CASBEE Urban Development
6 - 2000-Watt-Site

Other relevant indicator frameworks
1 - ClimateCon
2 - Global City Indicators Facility
3 - OECD Green growth in cities
4 - UN Habitat City Prosperity index
5 - UNECE United Smart Cities
6 - CITY PROTOCOL

Relevant FP7 and Horizon 2020 Projects
1 - CITINES (in development)
2 - CIVIS
3 - DESIRE
4 - ECODISTR-ICT
5 - EURBANLAB
6 - IDEAS
7 - PLEEC
8 - READY
9- TRANSFORM
10 - URB-GRADE
11 - URBES
12 - 2DECIDE

Relevant National Initiatives

Dutch
1 - SCP Rotterdam
2 - GPR-Stedenbouw
3 - IVAM - DPL (/Duurzaamheidsindex)
4 - Telos: European Green Capital Award
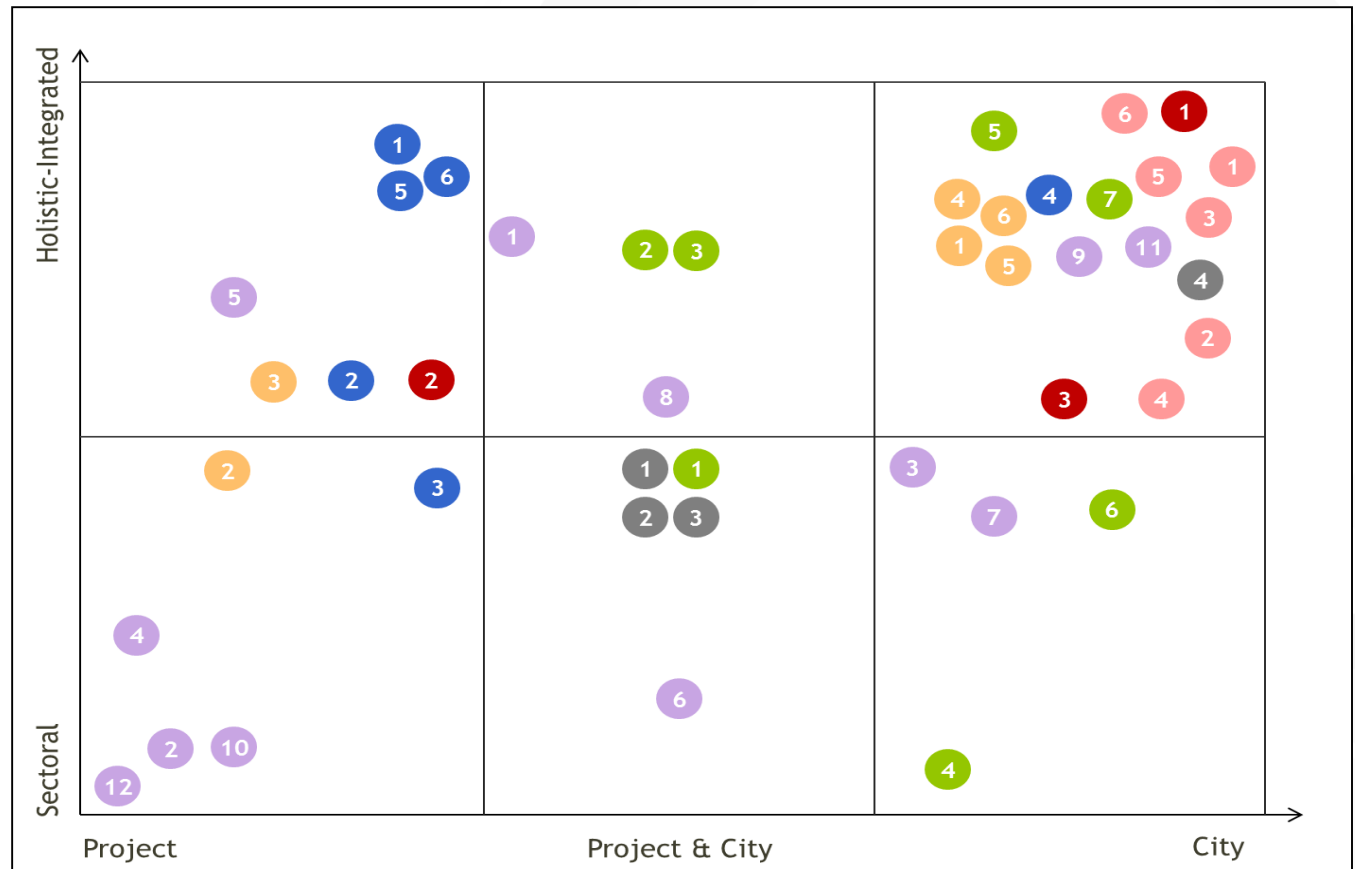Austrian
5 - Smart City Profiles
Finnish
6 - Common indicators for sustainable development in 6 Finnish cities

Other indicator systems mentioned in the proposal
1 - Siemens Green City Index
2 - Smart City Wheel
3 - Triple Helix

Mapping existing frameworks

Gap analyse

- There are in principle indicators available for each of the subthemes. However, there are significant variations in the coverage of the subthemes

- Best covered are People, Planet and Prosperity

- Gaps:
  - Project level Education, Employment, Scalability, Replicability
  - City level: Multilevel governance

- CITYkeys developed indicators to cover the gaps

People	Planet	Prosperity	Process	Propagation
• Education	• Energy & mitigation	• Employment	• Multilevel governance	• Scalability
• Diversity & social cohesion	• Other resources	• Equity	• Organisation	• Replicability
• Safety	• Climate resilience	• Green economy	• Co-creation	
• Health	• Environment	• Economic performance	• Community engagement	
• Quality of housing and of the built environment	• Ecosystem	• Accessibility		
• Access to (other) services		• Innovation		

CITYkeys Framework structure
Themes, Subthemes and # of project indicators

Framework is both for project and city level

People	Planet	Prosperity	Governance	Propagation
• Health (3)	• Energy & mitigation (7)	• Employment (2)	• Organisation (6)	• Scalability (10)
• Safety (4)	• Materials, water and land (10)	• Equity (2)	• Community involvement (5)	• Replicability (8)
• Access to (other) services (7)	• Climate resilience (1)	• Green economy (3)	• Multi-level governance (2)	
• Education (3)	• Pollution & waste (4)	• Economic performance (5)		
• Diversity & social cohesion (3)	• Ecosystem (2)	• Innovation (5)		
• Quality of housing and the built environment (6)		• Attractiveness & competitiveness (1)		

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Framework and datasets

- In total the smart city KPIs need 116 raw data sets
  - ➢ On average 72% of them seem available in partner cities
  - ➢ Most of them can be retrieved from statistical sources
- The boundaries of SC project data sets usually depend on the project
  - ➢ Needed data is typically not readily available
  - ➢ Typical sources include project documentation and interviews with project manager
- The share of open data providing the needed data sets varies from 1% to 25%, and is 15% on average
  - ➢ Cities have up to 300 open data sets in their portals but only some of them are relevant for CITYkeys smart city KPIs
  - ➢ Today, a smart city performance measurement system cannot yet rely only on open data

Smart City Index

- The CITYkeys city indicators can be aggregated into an index

- Several methodological issues in weighting and normalization remain

- Use of a city index limited for cities

- Value added on European level doubtful

Add your related KPIs (probably several that cover the UN SDG issue)	Please complete using the U4SSC (UNECE-ITU) list of areas	Please complete using the U4SSC (UNECE-ITU) list of topics *Economy (ICT, innovation, employment, trade, productivity, physical infrastructure) Environment (Air quality, water, noise, environmental quality, biodiversity,*	list of global Sustainable Development Goal indicators for Goal		
Please complete	*lease complet*	*Please complete*	*Goals and targets (from the 2030 Agenda)* ▾	*Indicators* ▾	*UNS Coa*
			Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable		
Fuel poverty; Affordability of housing; Access to basic health care services; Access to public transport; Access to public amenities; Crime rate;	Economy; Economy; Society; Economy; Economy; Society;	Economy (physical infrastructure); Economy (physical infrastructure); Society&Culture(health); Economy (physical infrastructure); Economy (physical infrastructure); Society&Culture(safety);	11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing	C110
Public transport use; Access to public transport; Access to vehicle sharing solutions for city travel; Length of bike route network; Traffic accidents; Congestion;			11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities	C110
Green space; Share of green and water spaces; Brownfield use; Population density;			11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate	C110
Citizen participation; Open public participation; Voter participation;				11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and	C110

Preservation of cultural heritage;			11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.4.1 Total expenditure (public and private) per capita spent on preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation)
None			11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable	11.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters
(Climate resilience strategy;) (GDP;)				11.5.2 Direct economic loss in relation to global GDP, damage to critical infrastructure and number
Municipal solid waste;			11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out
Fine particulate matter emissions (PM2.5);	Environment;	Environment (air quality);		11.6.2 Annual mean levels of particulate matter (e.g. PM2 PM10) in cities (population
Public outdoor recreation space; Green space; Share of green and water spaces;			11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.1 Average share of the built up area of cities that is open space for public use for all, by sex
Crime rate;				11.7.2 Proportion of persons victim of physical or sexual harassment, by sex, age, disa
None			11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional	11.a.1 Proportion of population living in cities that implement urban and regional developm
Climate resilience strategy; (not in Sendai framework)			11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai	11.b.1 Number of countries adopt and implement nationa disaster risk reduction strate
Climate resilience strategy; (not in Sendai framework)				11.b.2 Proportion of local governments that adopt and implement local disaster risl
None			11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	11.c.1 Proportion of financia support to the least develope countries that is allocated to construction and retrofitting

Conclusion CITYkeys, UN SDG11-U4SCC

- Very good alignment, only 3 KPIs were not covered due to the KPI focus in Europe

- Not covered
  - 11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
  - 11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
  - 11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

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Main recommendations

- Common framework and methodology are important in order to compare and understand the differences between solutions and the potential to replicate and scale to different cities/districts

- The indicators are often used for cities to see their own development

- Data availability and easy access are important in order to make the frame usable (M2M reading)

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