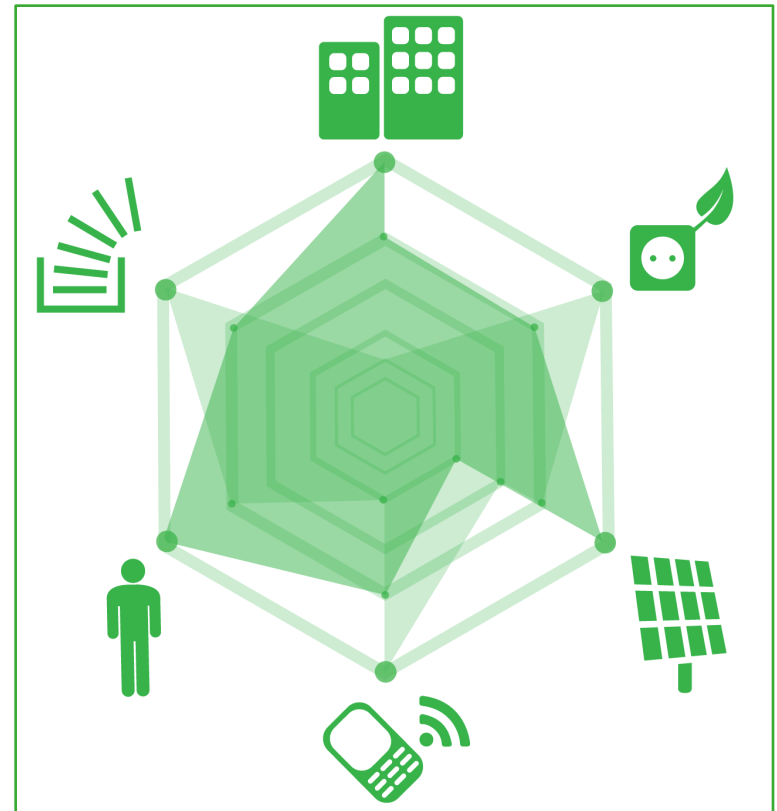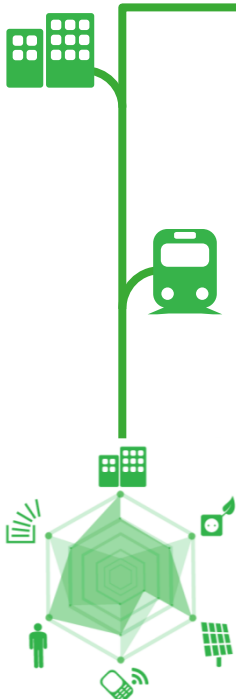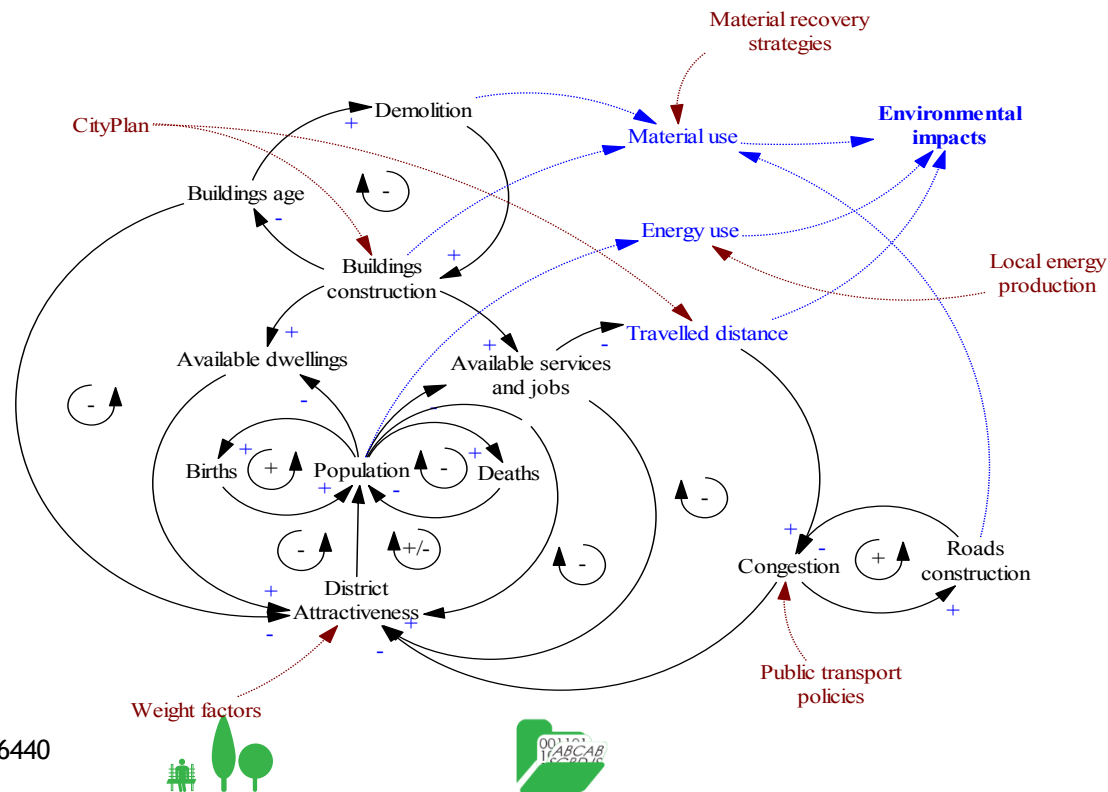# CITYkeys
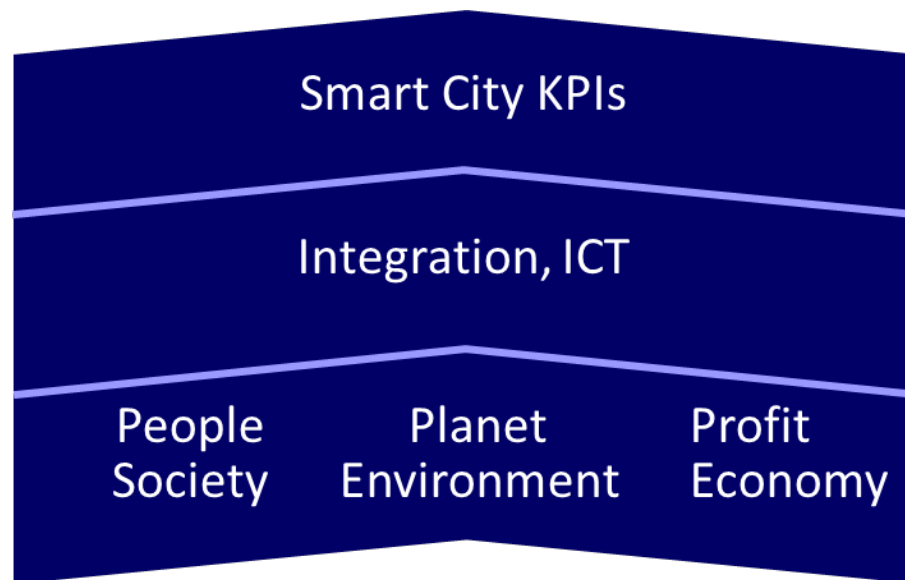## Performance measurement of smart cities

Miimu Airaksinen, VTT

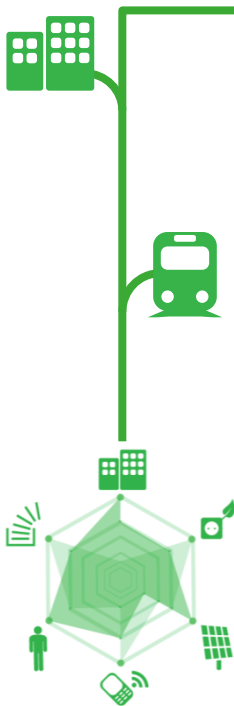# A city has many systems and sub systems which are interlinked and interconnected

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

Smart City KPIs

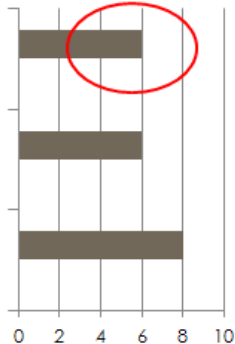Integration, ICT

People Society

Planet Environment

Profit Economy

From project to city

Reduction: 135t CO_2/yr

CO2 emissions

renewable energy

final energy consumption

0 2 4 6 8 10

9600
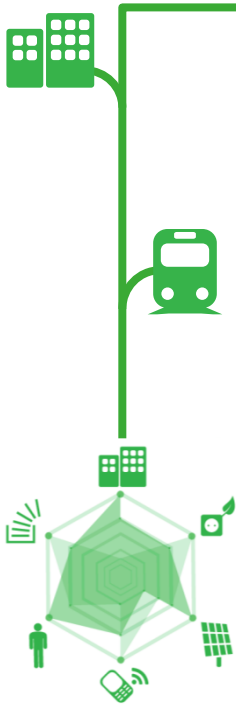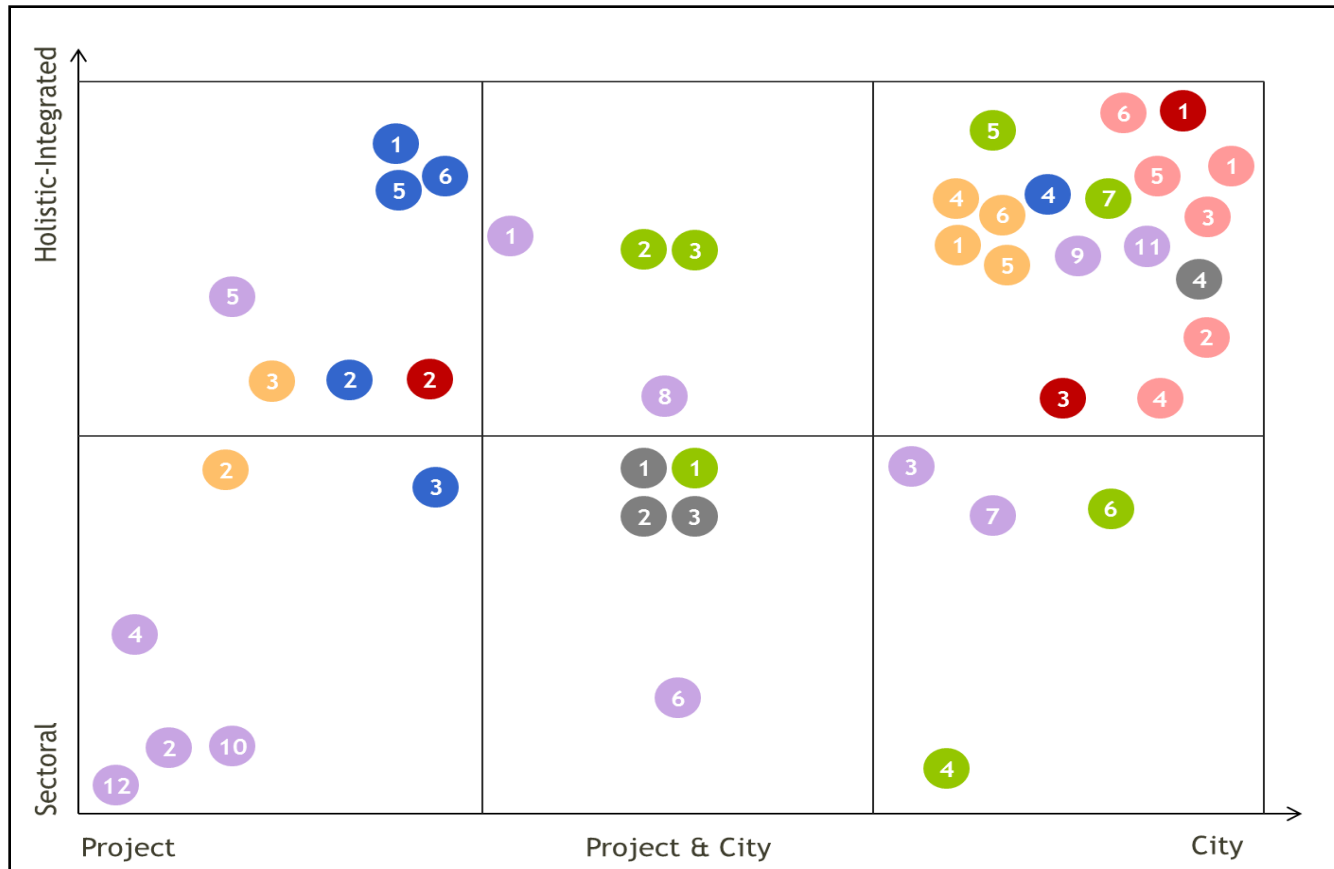9400
9200
9000
8800
8600
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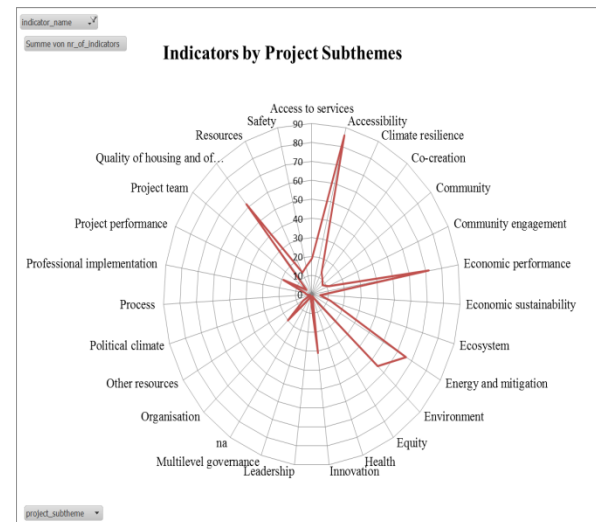
2007 2008 2009 2010 2011 2012 2013 2014 2015
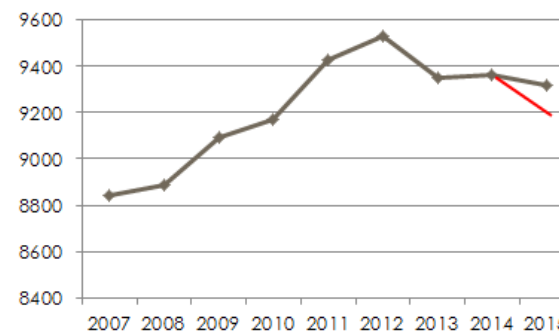
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Mapping existing frameworks

- 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

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Indicators by City Subthemes
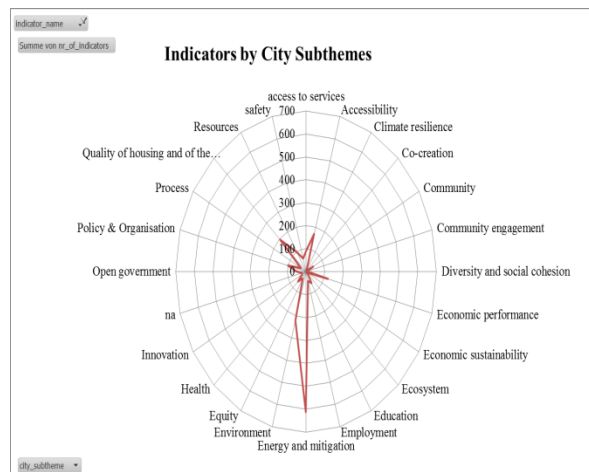
Indicators by Project Subthemes

Themes, Subthemes and # of project indicators

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)		

- 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
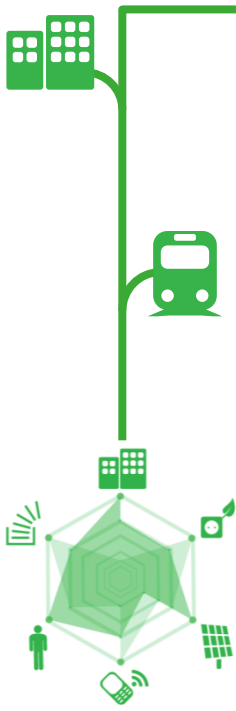
Testing of indicators in cities

- Both automatic reading and manually filling in the data
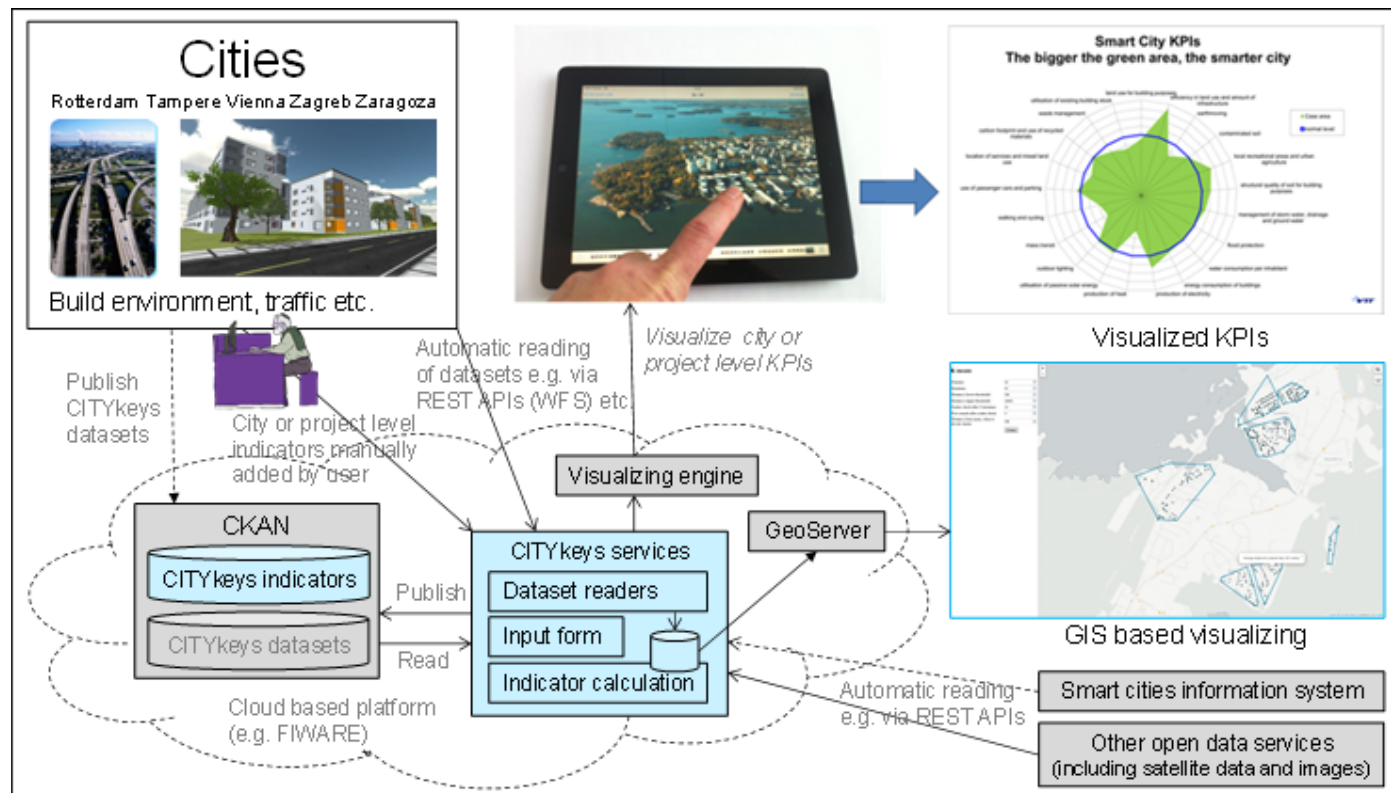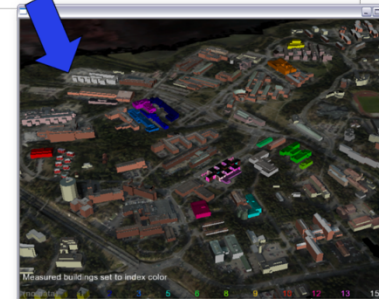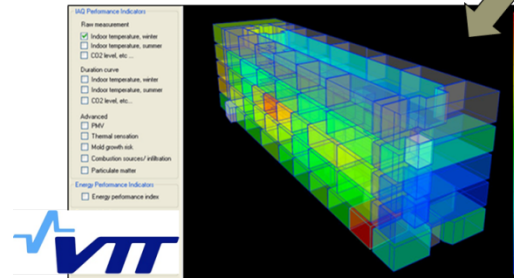
Web: www.citykeys-project.eu
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