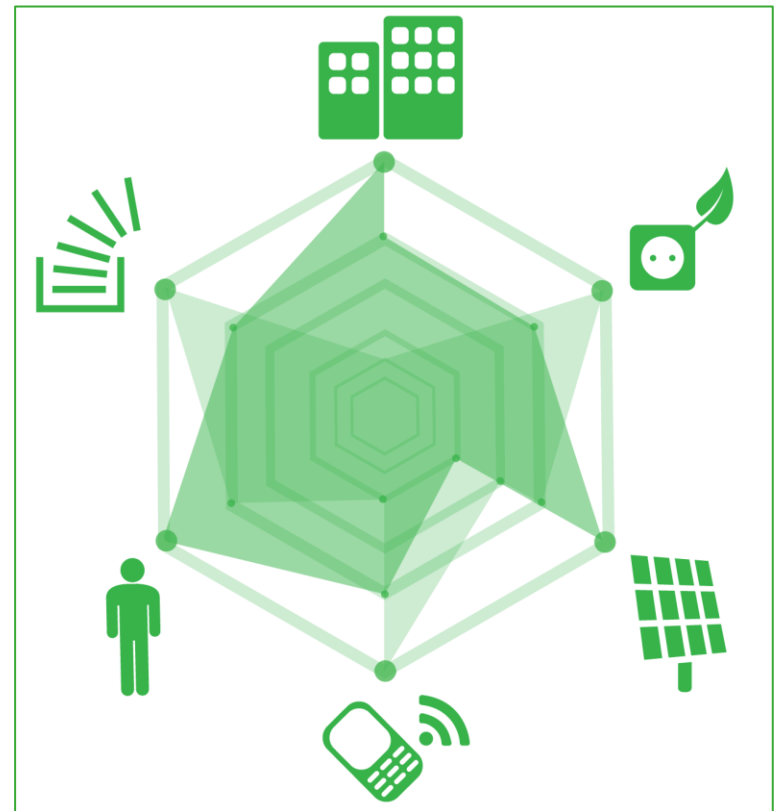


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Performance measurement of smart cities

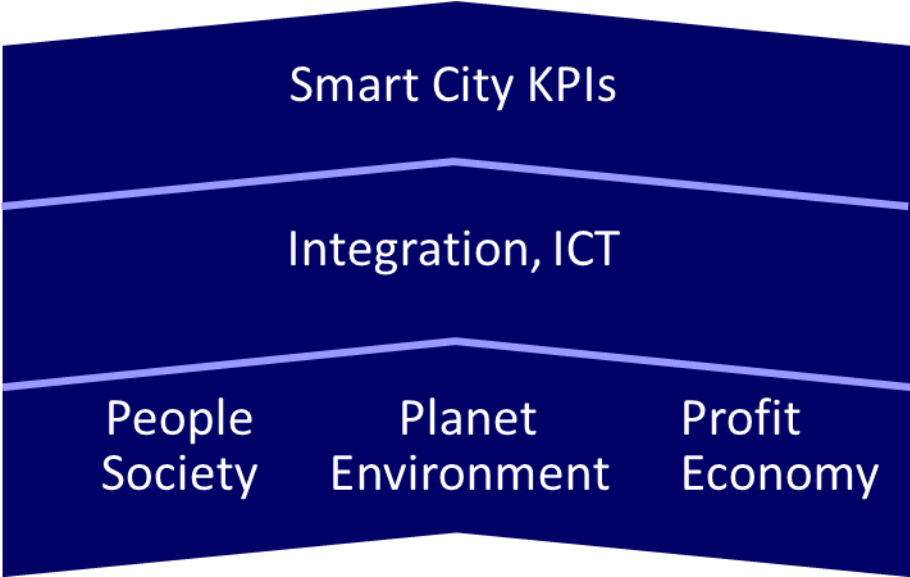
Centralized training for Supporting
structures, Zagreb, 10 March 2016

City of Zagreb
City office of Energy, Environment and
Sustainable Development





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



CITYkeys - 646440



Zagreb, 10 March 2016



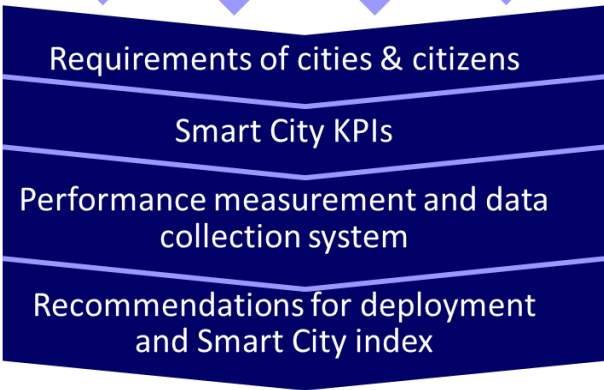
Existing frameworks:

EIP Smart Cities, FP7 Smart Cities research CityProtocol, CIVITAS, CONCERTO, RFSC

AIT, TNO, VTT

Rotterdam, Tampere, Vienna, Zagreb, Zaragoza

EUROCITIES



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 CO2



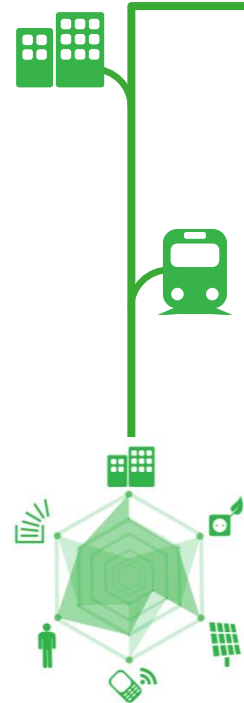
CITYkeys - 646440

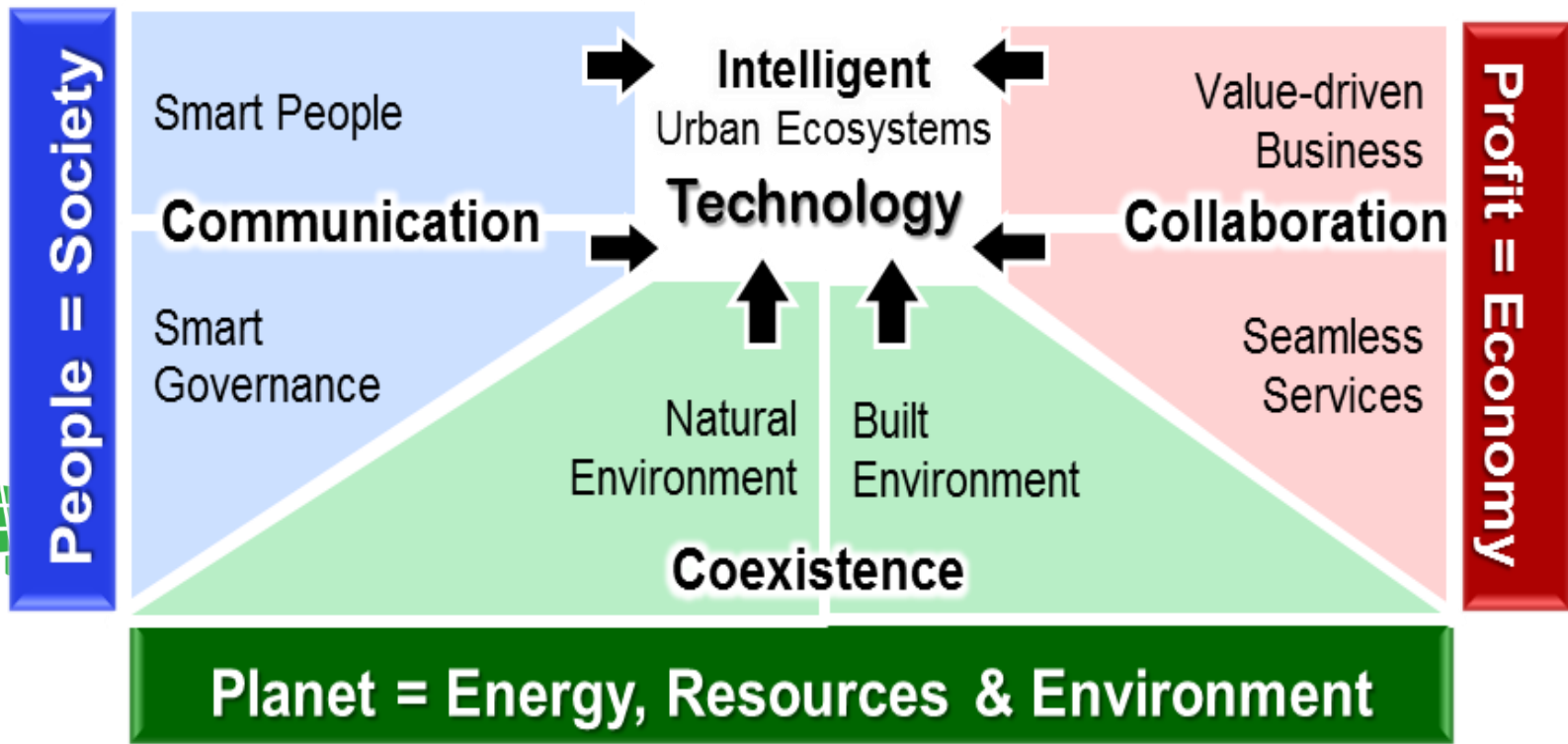


Gradski ured za energetiku, zaštitu okoliša i održivi razvoj



Zagreb, 10 March 2016





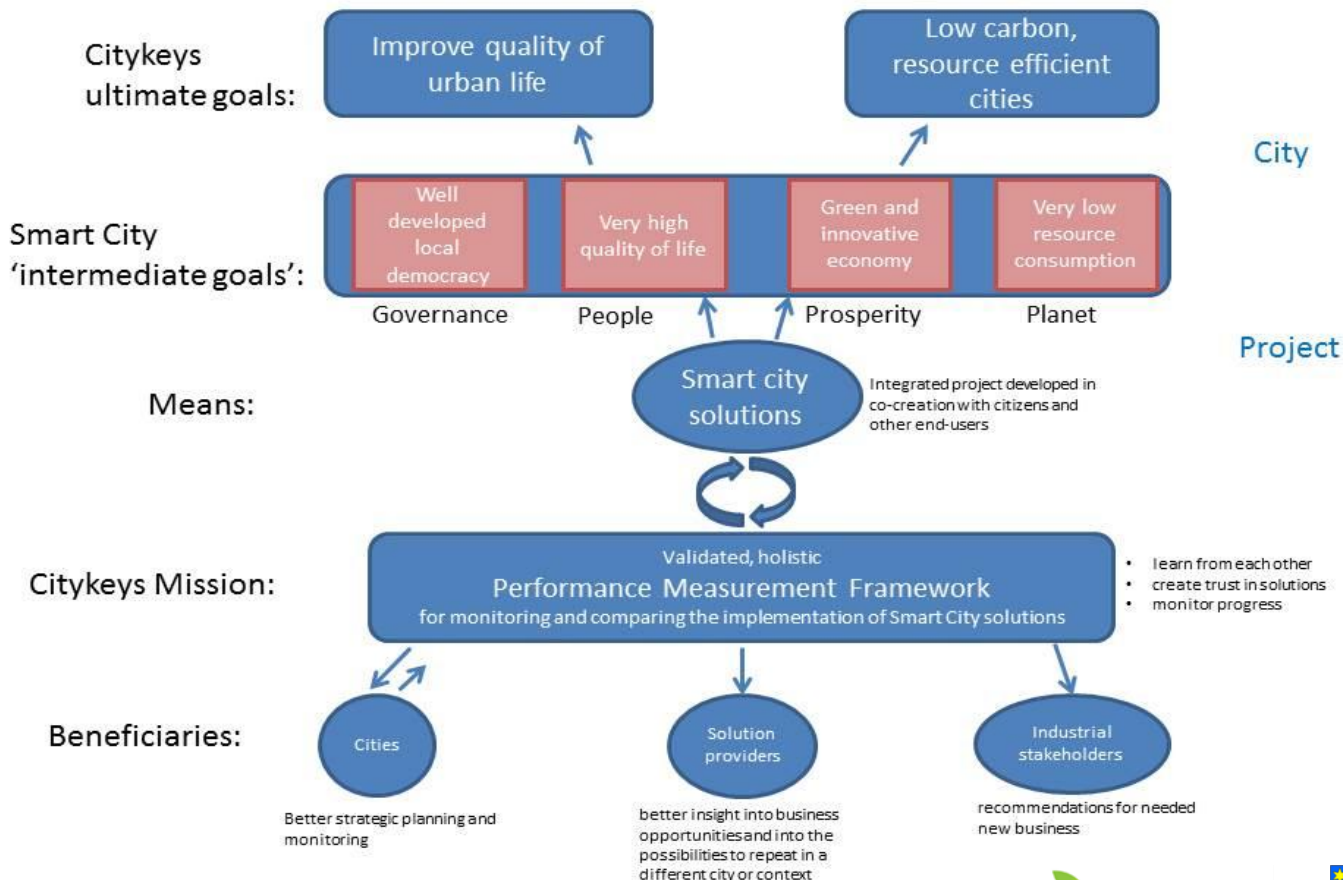
- Existing frameworks; Concerto, ITU etc.





Citykeys goal and strategy

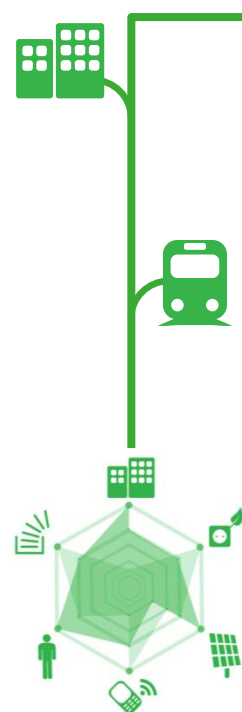
Level:



CITYkeys - 64644U

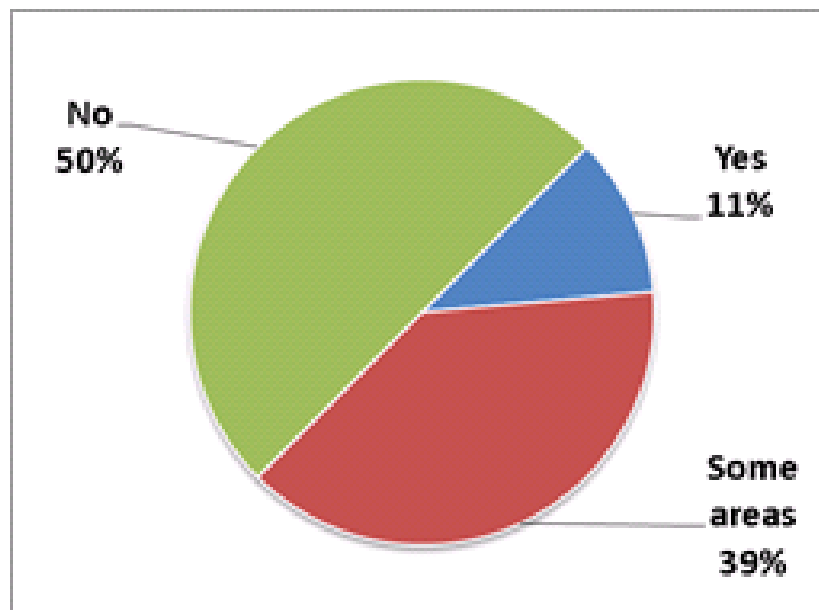


Zagreb, 10 March 2016





Smart city level: *Does your city measure its smart city performance?*



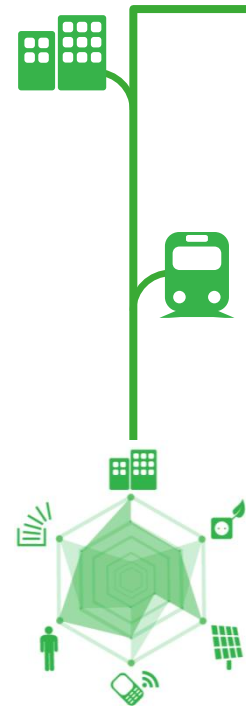
CITYkeys - 646440



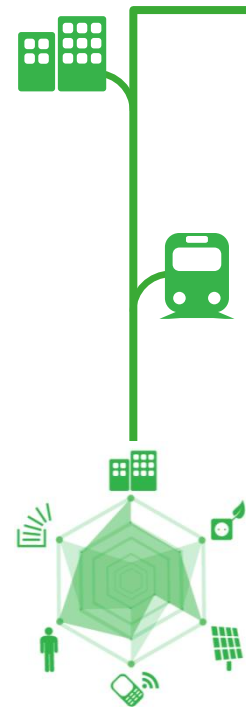
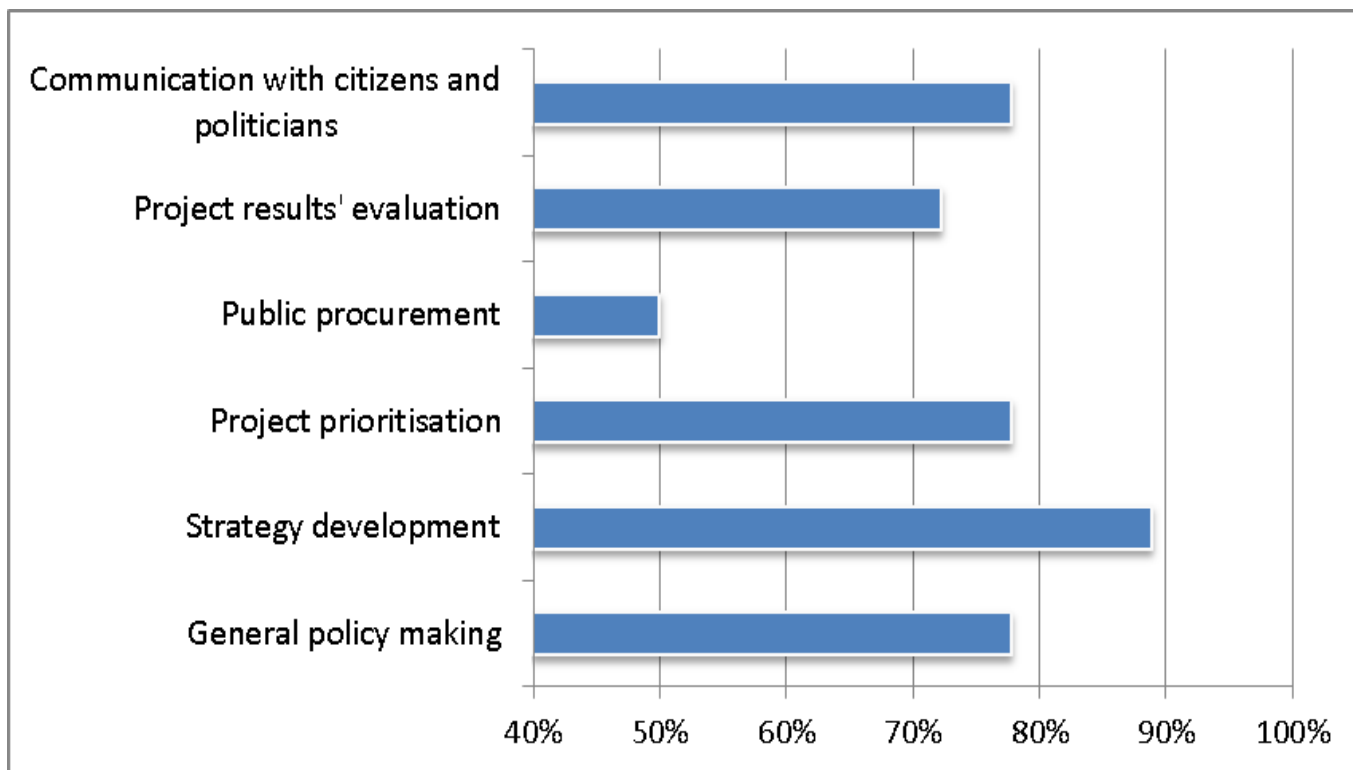
Gradski ured za energetiku,
zastitu okoliša i održivi razvoj



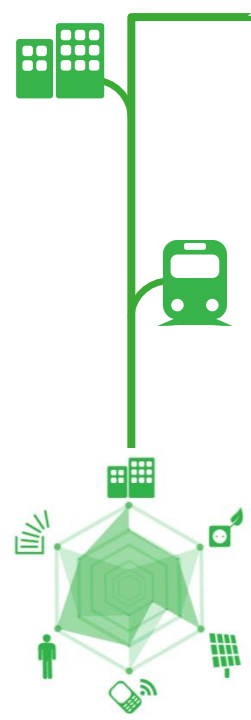
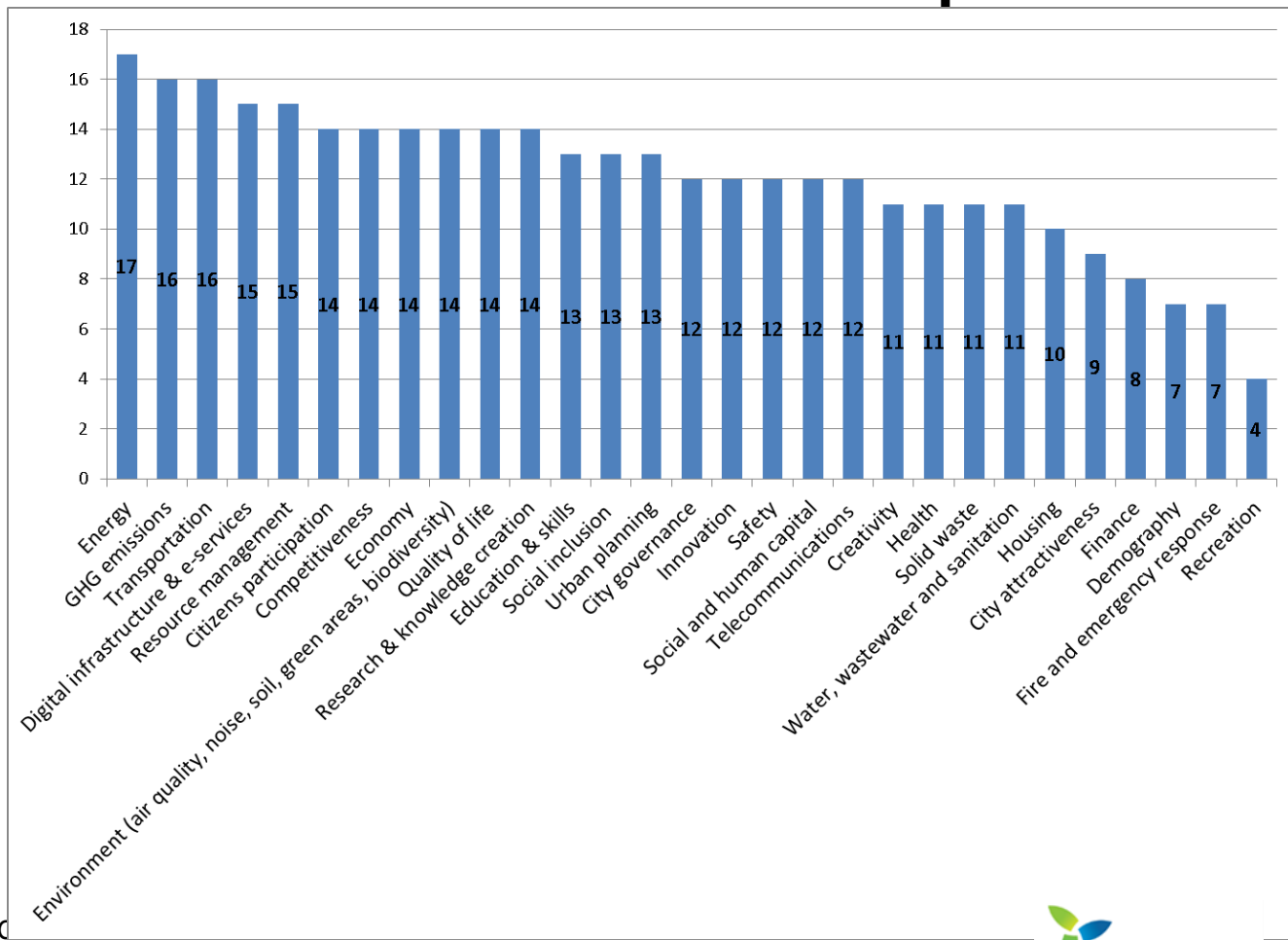
Zagreb, 10 March 2016



For what kind of decisions would you need performance measurement for?



Cities need to measure performance



Mapped existing frame works

- European frameworks
- International and European Standards
- Neighborhood certification schemes
- Relevant FP7 and H2020 projects
- Selected country frameworks
- Other international frameworks



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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 - URBANLAB
- 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

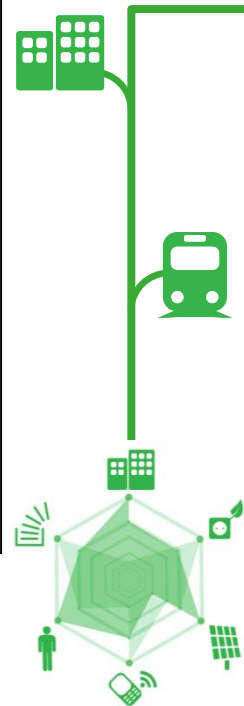
- 5 - Smart City Profiles

Finnish

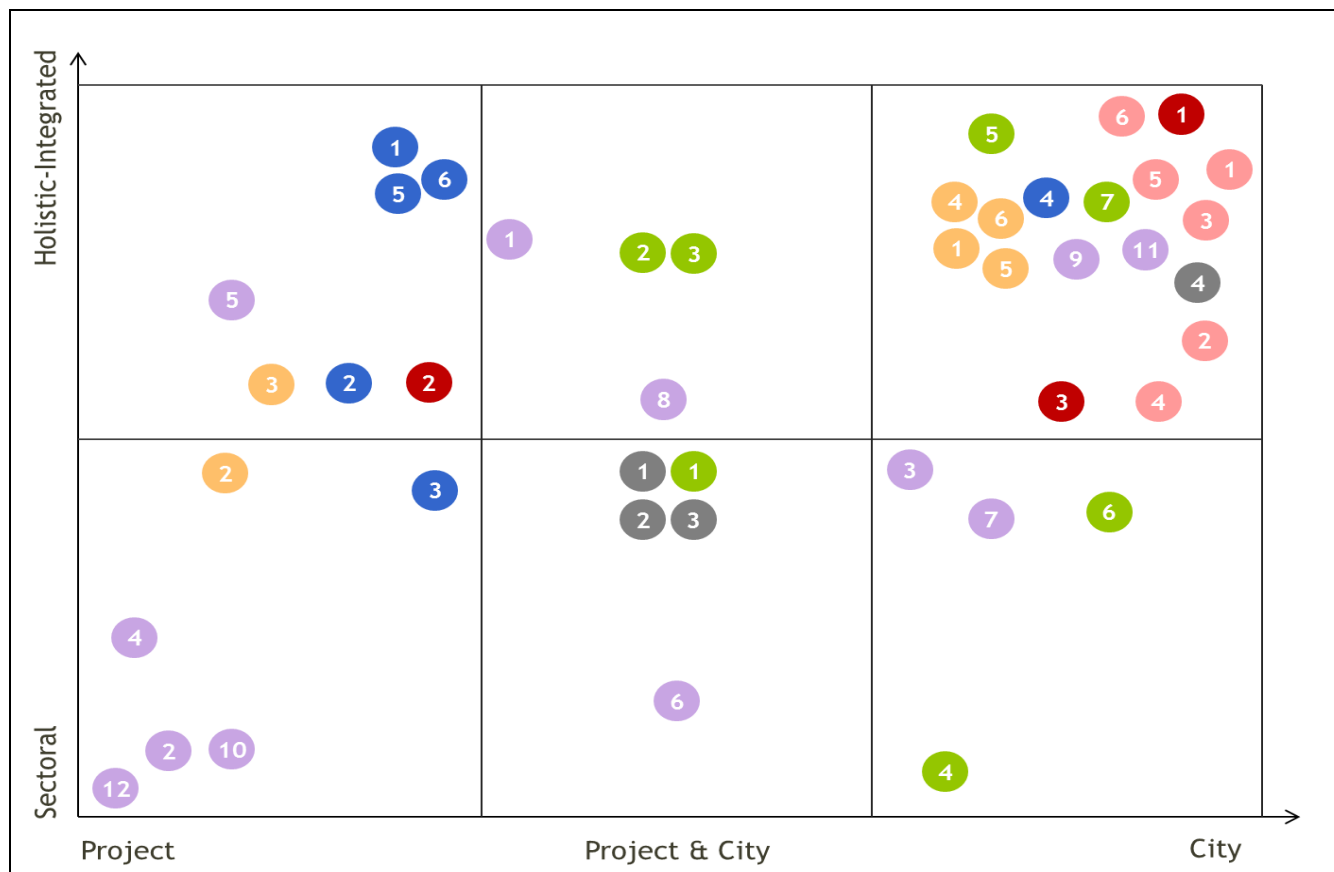
- 6 - Common indicators for sustainable development in 6 Finnish cities

Other indicator systems mentioned in the proposal

- 1 - Siemens Green City Index
- 2 - Smart City Wheel
- 3 - Triple Helix



Mapping existing frameworks



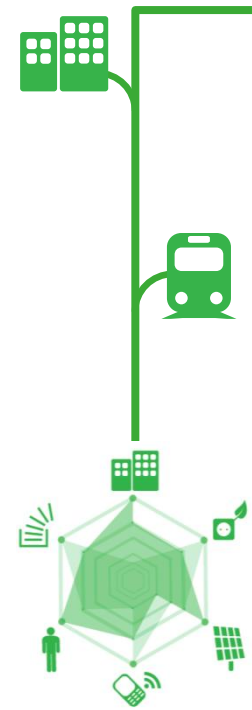
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Zagreb, 10 March 2016





Preliminary structure

| People | Planet | Prosperity | Process | Propagation |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• Education• <u>Diversity & social cohesion</u>• Safety• Health• Quality of housing and of the built environment• <u>Access to (other) services</u> | <ul style="list-style-type: none">• <u>Energy & mitigation</u>• Other resources• Climate resilience• Environment• <u>Ecosystem</u> | <ul style="list-style-type: none">• Employment• Equity• Green economy• Economic performance• Accessibility• Innovation | <ul style="list-style-type: none">• <u>Multilevel governance</u>• <u>Organisation</u>• Co-creation• Community engagement | <ul style="list-style-type: none">• <u>Scalability</u>• Replicability |



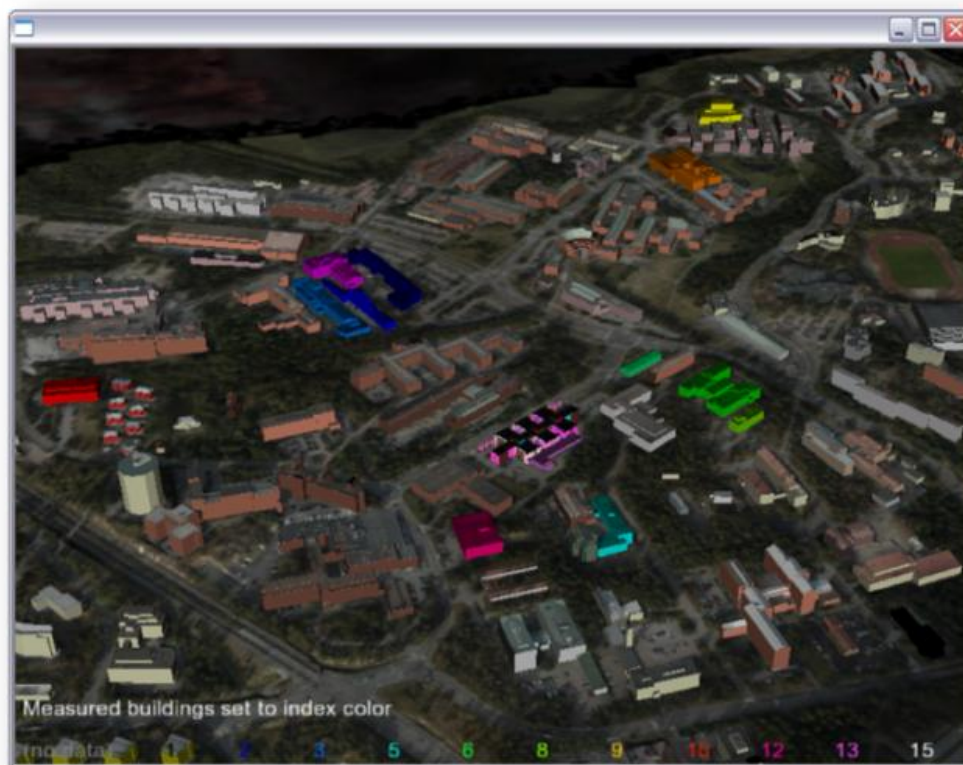
CITYkeys - 646440



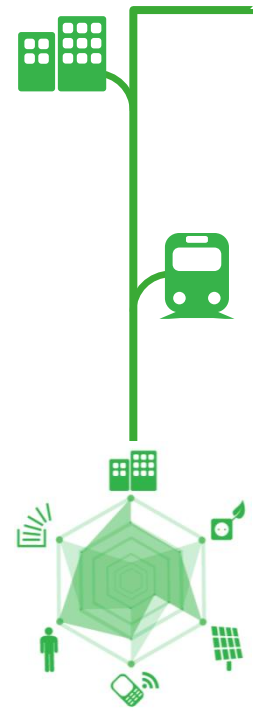
- There are in principle indicators available for each of the subthemes. However, there are significant variations in the coverage of the subthemes
- Best covered are People, Planet and Prosperity
- Gaps:
 - Project level Education, Employment, Scalability, Replicability
 - City level: Multilevel governance

| People | Planet | Prosperity | Process | Propagation |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Education • <u>Diversity & social cohesion</u> • Safety • Health • Quality of housing and of the built environment • <u>Access to (other) services</u> | <ul style="list-style-type: none"> • <u>Energy & mitigation</u> • Other resources • Climate resilience • Environment • <u>Ecosystem</u> | <ul style="list-style-type: none"> • Employment • Equity • Green economy • Economic performance • Accessibility • Innovation | <ul style="list-style-type: none"> • <u>Multilevel governance</u> • <u>Organisation</u> • Co-creation • Community engagement | <ul style="list-style-type: none"> • <u>Scalability</u> • Replicability |

- What you measure is what you get

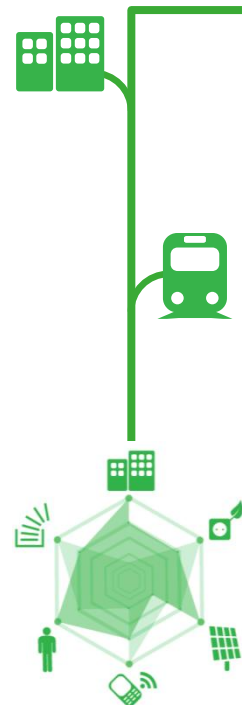


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Criteria for selecting indicators

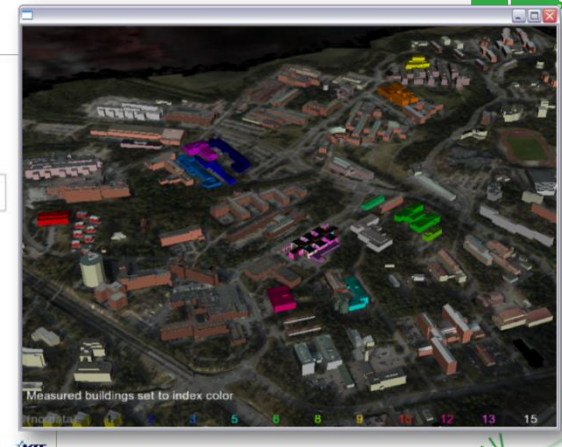
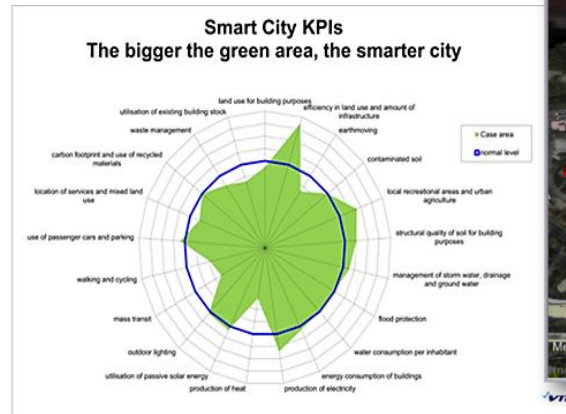
1. Relevance
2. Completeness
3. Availability
4. Measurability
5. Reliability
6. Familiarity
7. Non-redundancy
8. Independence





Performance monitoring

- Decision-support based on:
 - reliable real-time monitoring on smart city performance
 - holistic key performance indicators framework and a city index
- The implementation of a common performance measurement framework is based on a set of **relevant indicators, open data applications and decision-support user-interfaces**
 - enables stakeholders to learn from each other, create trust in solutions and monitor progress.

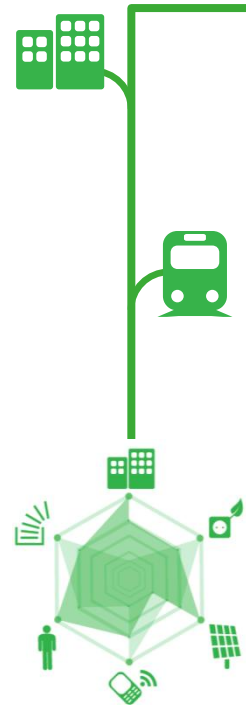


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CITYKEYS in nutshell

- The project focuses on developing and validating, together with cities, performance indicators and data collection procedures that will be used for the common and transparent monitoring of Smart City projects (initiatives/actions) and solutions across European cities.
- The key results are:
 - Key performance indicators for smart city projects
 - Performance measurement framework, Data sets & data collection
 - Policy making recommendations
 - Business models & opportunities
 - Smart city index recommendations





Thank you for your attention

City of Zagreb

City Office of Energy, Environment Protection and Sustainable Energy

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