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Key Performance Indicators for
Sustainable Digital Multiservice Cities

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Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Access, Terminals, Transmission and Multiplexing (ATTM).

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Executive summary

The present document describes the selection of indicators for assessing indicators on city level. Starting from the definition of a smart city, indicators have been selected that can function as Key Performance Indicators for tracking the progress towards city objectives.

The indicators for smart cities focus on monitoring the evolution of a city towards an even smarter city. The time component -"development over the years"- is an important feature. The city indicators may be used to show to what extent overall policy goals have been reached, or are within reach. With a starting point in the smart city definition, and taking into account the wishes of cities and citizens with regard to smart city indicators, the indicators are arranged in an extended triple bottom line sustainability framework, including the themes people, planet, prosperity, governance and propagation, and completed with specific smart city indicators. Under the main themes subthemes conforming to major policy ambitions have been identified. Under these subthemes in total 73 city indicators have been selected. The selection has been based on an inventory of 43 existing indicator frameworks for cities indicators. The majority of the indicators in the ICT users selection have been derived from existing indicator frameworks. New indicators have been suggested to fill gaps in existing frameworks.

Annex A of the present document presents the selection of indicators for ICT users.

Introduction

ICT users aim to speed up the transition to low carbon, resource-efficient cities by facilitating and enabling stakeholders in smart cities to learn from each other, create trust in solutions, and monitor progress, by means of a common performance measurement framework. The ultimate goal is to support the wide-scale deployment of smart city solutions and services in order to create impact on major societal challenges related to the cities' fast growth and the Union's 20/20/20 energy and climate targets. The expected benefits for different stakeholders can be summarized as follows:

- Cities will benefit from the ICT users results as they support their strategic planning and allow measuring their progress towards smart city goals. In addition, benefits are created from the enhanced collaboration within and between cities, providing the possibility to compare solutions and to find best practices.

- Policy makers will benefit from the indicators that help to set policy targets and monitor their achievement. ICT users KPI framework's sub-themes are formulated as policy goals and thereby the use of the indicators and therefore the indicators are especially useful to follow progress towards policy goals.

- Solution providers will benefit from better insight into business opportunities for their products and services, and into the possibilities for replication in a different city or context.

- Industrial stakeholders will benefit from the recommendations for new business, e.g. based on open data. Citizens will benefit from the indicators as they may help to get a better understanding of complex projects and their impacts.

All these opportunities should bring environmental benefits such as reduction of CO_2 emissions, increased energy efficiency, increased share of renewables, as well as improve the quality of life through better mobility, better communication between local authorities and their citizens, empowerment of citizens (i.e. smart citizens). For the development of the performance measurement framework, ICT users are building on existing smart city and sustainable city indicator systems. The bases of the ICT users indicator framework (Based on CITYkeys deliverable 1.4 [i.1]) are the traditional sustainability impact categories **People, Prosperity and Planet**, but the performance measurement framework includes specific smart city KPIs that go beyond the traditional categories in showing not only the impact but also indices of the success factors for smart city endeavours and the suitability for dissemination to other cities and circumstances. The transparent and flexible ICT Users 'performance measurement framework will be able to handle different sizes of cities in different smart city development stages and thereby support different development strategies of smart cities and -initiatives over a wide range of characteristics.

1 Scope

The present document defines indicators (KPIs) for Smart Cities expressing city level in terms of People, Planet, Prosperity, Governance and Propagation.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

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The following referenced documents are necessary for the application of the present document.

[1] Recommendation ITU-T L.1440: "Methodology for environmental impact assessment of information and communication technologies at city level".

[2] Recommendation ITU-T L.1430: "Methodology for assessment of the environmental impact of information and communication technology greenhouse gas and energy projects".

[3] ISO 1996-2:1987: "Describes methods for measuring and describing noise of the environment relevant to a specified area, existing or planned. Does not give guidance on the estimation of the overall uncertainty of the results. Noes not specify noise limits".

[4] ISO 37120:2014: "Sustainable development of communities -- Indicators for city services and quality of life".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] European project CITYkeys deliverable D1.4: "D1.4-CITYkeys-D14-Smart-City-KPIs-Final-20160201".

NOTE: Available at http://citykeys-project.eu/citykeys/resources/general/download/CITYkeys-D1-4-Smart-City-smart-project-KPIs-and-related-methodology-final-WSWE-A7LN3E.

[i.2] ETSI GS OEU 019: "Operational energy Efficiency for Users (OEU); KPIs for Smart Cities".

[i.3] ITU, 2014: "Key performance indicators (KPIs) definitions for smart sustainable cities". ITU focus group on smart sustainable cities.

[i.4] ISO 14000 series: "Environmental management".