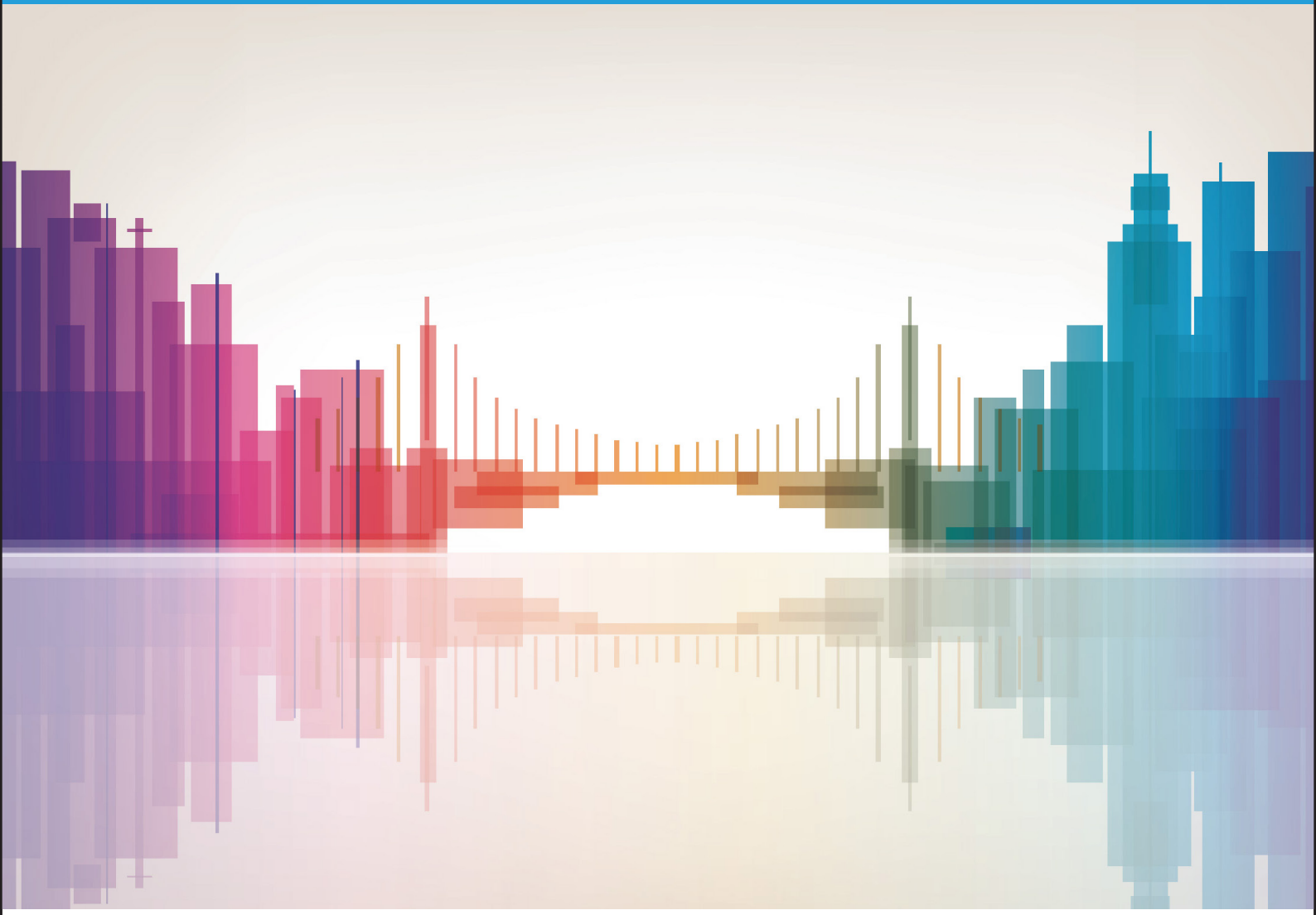
United 4 Smart Sustainable Cities

Verification Report
Krimpen aan den IJssel, The Netherlands

June 2020



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United 4 Smart Sustainable Cities

Verification Report

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SUSTAINABLE CITIES
AND COMMUNITIES

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Foreword

This publication has been developed within the framework of the United for Smart Sustainable Cities (U4SSC) initiative. It provides an overview of the reporting and implementation of key performance indicators (KPIs) for smart sustainable cities (SSC) in the City of Krimpen aan den IJssel, The Netherlands. This set of KPIs for SSC was developed to establish the criteria to evaluate ICTs' contributions in making cities smarter and more sustainable, and to provide cities with the means for self-assessments.

Disclaimer

The views expressed in this publication are those of the author and do not necessarily reflect the views of the contributing organizations.

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This publication is intended for informational purposes only. The results and interim findings presented are a work in progress, as the KPIs (ITU-T Recommendation Y.4903/L.1603) implemented in Krimpen aan den IJssel during the first phase of the project are being refined to improve the applicability of these KPIs to all cities. The revision of the KPIs may alter their scope and definition as well as the required data-collection process.

1. Introduction and Verification Background

This report contains the verification results for the KPI submission by the city of Krimpen aan den IJssel to the requirements of the United for Smart Sustainable Cities (U4SSC) Key Performance Indicators (KPIs) as described within the 'Collection Methodology for Key Performance Indicators for Smart Sustainable Cities'. [1]

John Smiciklas, who is certified as a U4SSC Key Performance Indicators for Smart Sustainable Cities Verifier, completed the verification in November 2018.

The verification assessment activities included:

- Collecting and reviewing KPI data.
- Interviewing city stakeholders.
- Verifying that the data submitted is in conformity with the requirements of the Collection Methodology for Key Performance Indicators for Smart Sustainable Cities.
- Preparing the Verification Report.

The verification was conducted using the information made available during the onsite visit and the information presented during follow-up activities. It was planned and performed in order to obtain limited assurance with respect to the information examined.

There were no limitations that impacted the completion of this verification.

[1] *https://www.itu.int/en/publications/Documents/tsb/2017-U4SSC-Collection-Methodology/index.html*

2. KPI Reporting and Verification Summary

	Total	Reported	Verified	% KPIs Verified
Economy				
Core KPIs	23	21	21	91%
Advanced KPIs	22	19	19	86%
Environment				
Core KPIs	12	12	12	100%
Advanced KPIs	5	4	4	80%
Society & Culture				
Core KPIs	19	18	18	95%
Advanced KPIs	10	8	8	80%
Overall				
Core KPIs	54	51	51	94%
Advanced KPIs	37	31	31	84%
Total	**91**	**82**	**82**	**90%**

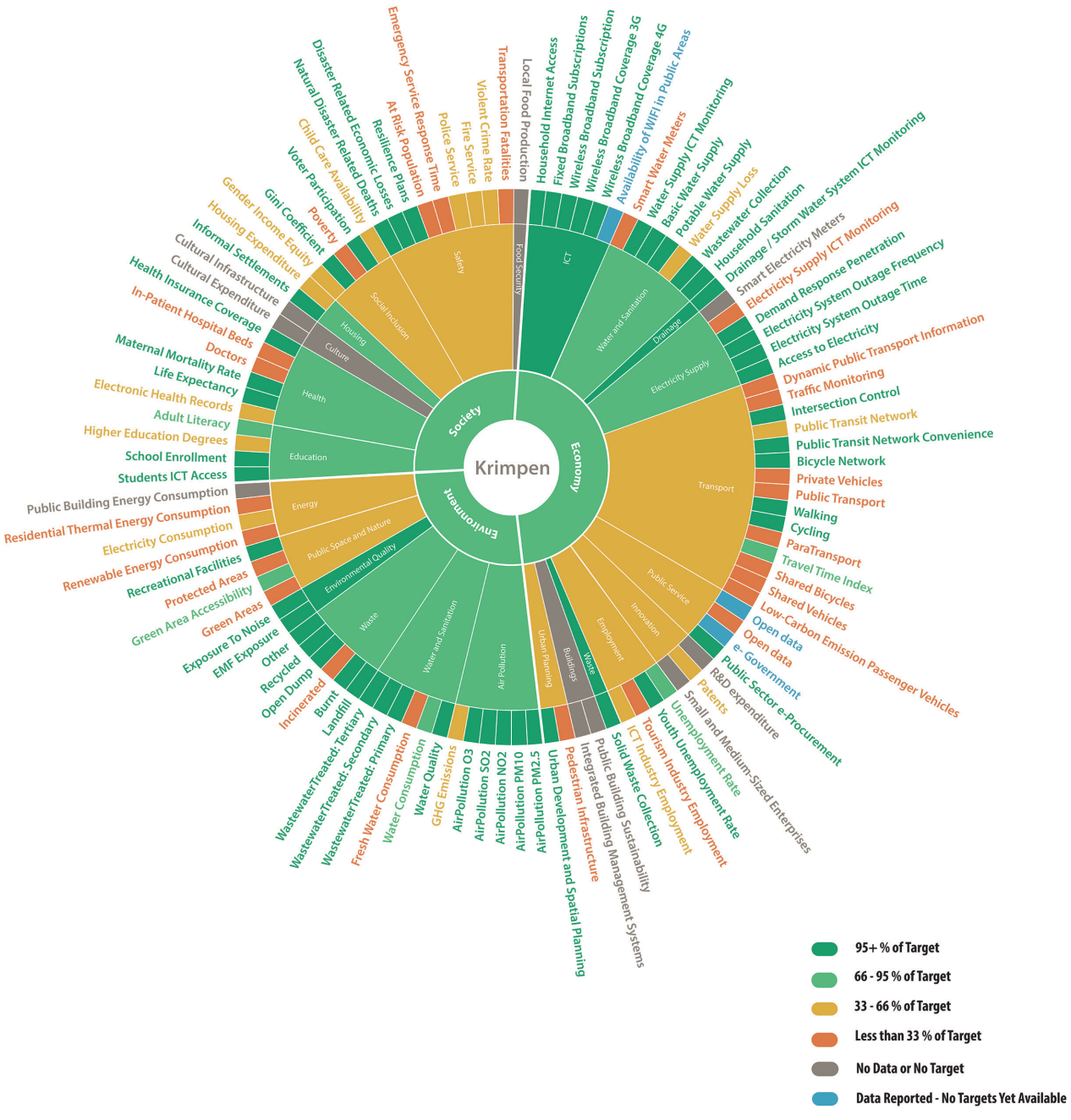
3. KPI Data Points Reporting and Verification Summary

Certain KPIs are composed of more than one data point.

Below is a summary of the verification results of those data points

	Total	Reported	Verified	% Data Points Verified
Economy				
Core Data Points	24	22	22	88%
Advanced Data Points	31	28	28	90%
Environment				
Core Data Points	23	23	23	100%
Advanced Data Points	5	4	4	80%
Society & Culture				
Core Data Points	19	18	18	95%
Advanced Data Points	10	8	8	80%
Overall				
Core Data Points	66	63	63	94%
Advanced Data Points	46	40	40	87%
Total	**112**	**103**	**103**	**92%**

4. City Performance Benchmark



Note: Performance Benchmark Targets apply to all sections of the graphic. Starting from the centre: Dimensions, Categories and KPIs

5. Benchmarks and Scoring Methodology

As part of the U4SSC KPI project, benchmarks were developed for most KPIs to develop a reporting framework to demonstrate to cities how their performance could be reported.

The benchmarks were set based on several factors:

- Fully meeting the aligned SDG
- Performance compared to other international and transnational targets (e.g. OECD, European Commission)
- Performance against the goals of a UN agency (e.g. International Telecommunication Union)
- Evaluation of city performance using UN and other international statistical data
- Performance measured versus leading city performance globally

Performance to benchmarks were then scored in four ranges for every KPI and data point reported:

- 0 – 33 % of target – 1 pt;
- 33 – 66 % of target – 2 pts;
- 66 – 95 % of target – 3 pts; and
- 95+ % of target – 4 pts.

The scores for each reported KPI and data point were added to give a percentage score for categories, sub-dimensions and dimensions, and reported based on the above target scores. KPIs or data points that are not reported or for which benchmarks have not yet been defined were excluded.

Example: Education 4 KPIs

- If all 4 are reported and the scores are 1 pt, 3 pts, 4 pts and 1 pt;

  Total score 9 pts out of 16 = 56.25 % reported as 33 – 66 % of target.
- If only 3 are reported and the scores are 3 pts, 4 pts and 2 pts;

  Total score 9 pts out of 12 = 75 % reported as 66 – 95 % of target.

Targets and scoring are meant to provide additional context to KPI data and should be used in conjunction with city goals and comparisons with other similar cities to determine future actions.

6. Verification Results

This section contains the data and results of the verification for Krimpen aan den IJssel reporting for each of the U4SSC KPIs within the three (3) dimensions:

- Economy
- Environment
- Society and Culture

and the twenty-two (22) categories of the dimensions:

- ICT Infrastructure
- Water and Sanitation
- Drainage
- Electricity Supply
- Transport
- Public Sector
- Innovation
- Employment
- Waste
- Buildings
- Urban Planning
- Air Quality
- Environmental Quality
- Public Space and Nature
- Energy
- Education
- Health
- Culture
- Housing
- Social Inclusion
- Safety
- Food Security

Note: The following categories are reported under the Economy and the Environment dimensions

- Water and Sanitation
- Waste

Note: For the results on following pages

- **Core KPIs are highlighted in bold.**
- *Advanced KPIs are in italics.*

Dimension: Economy

CATEGORY	KPI / Data Point	Results	Benchmark
 ICT INFRASTRUCTURE	**Household Internet Access**	**100.00 %**	
	Fixed Broadband Subscriptions	**98.00 %**	
	Wireless Broadband Subscriptions	**97 932.16 / 100 000 inhabitants**	
	Wireless Broadband Coverage: 3G	**100.00 %**	
	Wireless Broadband Coverage: 4G	**100.00 %**	
	Availability of Wi-Fi in Public Areas	*7*	N/A
 WATER AND SANITATION	**Smart Water Meters**	**0.00 %**	
	Water Supply ICT Monitoring	*100.00 %*	
	Basic Water Supply	**100.00 %**	
	Potable Water Supply	**100.00 %**	
	Water Supply Loss	**6.70 %**	
	Wastewater Collection	**100.00 %**	
	Household Sanitation	**100.00 %**	
 DRAINAGE	*Drainage/Storm Water System ICT Monitoring*	*100.00 %*	

CATEGORY	KPI / Data Point	Results	Benchmark
ELECTRICITY SUPPLY	**Smart Electricity Meters**	**Not Reported**	
	Electricity Supply ICT Monitoring	*11.32 %*	
	Demand Response Penetration	*100.00%*	
	Electricity System Outage Frequency	**0.25**	
	Electricity System Outage Time	**24.00 Minutes**	
	Access to Electricity	**100.00 %**	
 TRANSPORT	**Dynamic Public Transport Information**	**22.41 %**	
	Traffic Monitoring	**0.00 %**	
	Intersection Control	*100.00 %*	
	Public Transport Network	**114.31 km / 100 000 inhabitants**	
	Public Transport Network Convenience	*95.88 %*	
	Bicycle Network	**630.08 km / 100 000 inhabitants**	
	Transportation Mode Share: Private Vehicles	*51.34 %*	
	Transportation Mode Share: Public Transport	*5.53 %*	
	Transportation Mode Share: Walking	*15.33 %*	
	Transportation Mode Share: Cycling	*25.18 %*	

CATEGORY	KPI / Data Point	Results	Benchmark
	Transportation Mode Share: Para Transport	*0.00 %*	
	Travel Time Index	*1.89*	
	Shared Bicycles	*17.06 / 100 000 inhabitants*	
	Shared Vehicles	*10.24 / 100 000 inhabitants*	
	Low-Carbon Emission Passenger Vehicles	*1.40 %*	
PUBLIC SECTOR	*Open Data Sets Published*	*0 Data Sets Published*	N/A
	Open Data Sets % Availability	*0.00 %*	
	e-Government	*36 Services*	N/A
	Public Sector e-Procurement	*100.00%*	
INNOVATION	**R&D Expenditure**	**Not Reported**	
	Patents	**17.06 / 100 000 inhabitants**	
	Small and Medium-Sized Enterprises	*Not Reported*	
EMPLOYMENT	**Unemployment Rate**	**4.76 %**	
	Youth Unemployment Rate	**2.61 %**	
	Tourism Sector Employment	*0.95 %*	
	ICT Sector Employment	*4.10 %*	
WASTE	**Solid Waste Collection**	**100.00 %**	

CATEGORY	KPI / Data Point	Results	Benchmark
 BUILDINGS	*Public Building Sustainability*	*Not Reported*	
	Integrated Building Management Systems in Public Buildings	*Not Reported*	
URBAN PLANNING	*Pedestrian Infrastructure*	*0.00 %*	
	Urban Development and Spatial Planning: Compact	*YES*	
	Urban Development and Spatial Planning: Connected	*YES*	
	Urban Development and Spatial Planning: Integrated	*YES*	
	Urban Development and Spatial Planning: Inclusive	*YES*	
	Urban Development and Spatial Planning: Resilient	*YES*	

Dimension: Environment

CATEGORY	KPI / Data Point	Results	Benchmark
 AIR QUALITY	Particulate Matter (PM 2.5)	8.90 µg / m^3	
	Particulate Matter (PM 10)	17.60 µg / m^3	
	Nitrogen Dioxide (NO2)	35.20 µg / m^3	
	Sulphur Dioxide (SO2)	5.80 µg / m^3	
	Ozone (O3)	11.40 µg / m^3	
	GHG Emissions	10.00 tonnes eCO_2 / capita	
 WATER AND SANITATION	Drinking Water Quality	100.00 %	
	Water Consumption	128.04 ℓ / day / Capita	
	Freshwater Consumption	100.00 %	
	Wastewater Treatment: Primary	100.00 %	
	Wastewater Treatment: Secondary	100.00 %	
	Wastewater Treatment: Tertiary	100.00 %	

CATEGORY	KPI / Data Point	Results	Benchmark
 WASTE	**Solid Waste: Landfill**	**0.00 %**	
	Solid Waste: Burnt	**0.00 %**	
	Solid Waste: Incinerated	**33.00 %**	
	Solid Waste: Open Dump	**0.00 %**	
	Solid Waste: Recycled	**67.00 %**	
	Solid Waste: Other	**0.00%**	
 ENVIRONMENTAL QUALITY	**EMF Exposure**	**100.00 %**	
	Noise Exposure	*0.88 %*	
 PUBLIC SPACE AND NATURE	**Green Areas**	**6.48 ha / 100 000 inhabitants**	
	Green Area Accessibility	*92.13 %*	
	Protected Natural Areas	*1.16 %*	
	Recreational Facilities	*11 910 185 m²/ 100 000 inhabitants*	
 ENERGY	**Renewable Energy Consumption**	**1.66 %**	
	Electricity Consumption	**2 724.16 kWh / yr / capita**	
	Residential Thermal Energy Consumption	**778.17 GJ / yr / capita**	
	Public Building Energy Consumption	*Not Reported*	

Dimension: Society and Culture

CATEGORY	KPI / Data Point	Results	Benchmark
 EDUCATION	**Student ICT Access**	**100.00 %**	
	School Enrolment	**95.19 %**	
	Higher Education Degrees	**17 068 / 100 000 inhabitants**	
	Adult Literacy	**85.50 %**	
 HEALTH	*Electronic Health Records*	*64.70 %*	
	Life Expectancy	**83.32 Years**	
	Maternal Mortality Rate	**0.00 / 100 000 live births**	
	Physicians	**61.42 / 100 000 inhabitants**	
	In-Patient Hospital Beds	*0.00 / 100 000 inhabitants*	
	Health insurance / Public Health Coverage	*100.00 %*	
 CULTURE	**Cultural Expenditure**	**Not Reported**	
	Cultural Infrastructure	*Not Reported*	N/A
 HOUSING	**Informal Settlements**	**0.00 %**	
	Housing Expenditure	*32.90 %*	

CATEGORY	KPI / Data Point	Results	Benchmark
 SOCIAL INCLUSION	**Gender Income Equity**	**0.85 Ratio Female: Male**	
	Gini Coefficient	**0.29**	
	Poverty Rate	**5.20 %**	
	Voter Participation	**66.75 %**	
	Childcare Availability	*50.32 %*	
 SAFETY	**Natural Disaster-Related Deaths**	**0.00 / 100 000 inhabitants**	
	Disaster Related-Economic Losses	**0.00% / City GDP**	
	Resilience Plans	*Yes*	
	Population Living in Disaster-Prone Areas	*100.00 %*	
	Emergency Service Response Time	*13.00 Minutes*	
	Police Service	**176.00 FTE / 100 000 inhabitants**	
	Fire Service	**85.31 FTE / 100 000 inhabitants**	
	Violent Crime Rate	**443.60 / 100 000 inhabitants**	
	Traffic Fatalities	**3.41 / 100 000 inhabitants**	
 FOOD SECURITY	*Local Food Production*	*Not reported*	

7. KPIs Not Reported

KPI Number	Description
EC: ICT: ES: 1C	Smart Electricity Meters
EC: P: IN: 1C	R&D expenditure
EC: P: IN: 3A	Small and Medium-Sized Enterprises
EC: I: B: 1A	Public Building Sustainability
EC: I: B: 2A	Integrated Building Management Systems
EN: E: E: 4C	Public Building Energy Consumption
SA: EH: C: 1C	Cultural Expenditure
SC: EH: C: 2A	Cultural Infrastructure
SC: SH: FS: 1A	Local Food Production

8. KPIs Not Verified

None.

9. Next Steps

Krimpen aan den IJssel is encouraged to focus on KPIs that have been reported as falling within the benchmarks of 0 – 33% and 33 – 66% of targets and determine which of these KPIs indicate critical issues for the city and develop plans for improvement.

Krimpen aan den IJssel is encouraged to review the KPIs for which no data were reported and determine plans for future data collection and reporting.

Krimpen aan den IJssel is encouraged to continue ongoing data collection to determine trends in performance against benchmarks over time.

Krimpen aan den IJssel is encouraged to stay engaged within the U4SSC process and continue to provide feedback on KPIs and benchmarks.

10. Using KPIs for SSC to Reach the SDGs

The **United for Smart Sustainable Cities (U4SSC)** initiative has developed the Key Performance Indicators (KPIs) for Smart Sustainable Cities (SSC) to support cities worldwide in evaluating the role and contribution of ICTs in smart sustainable cities, and to provide cities with the tools for self-assessments, in order to achieve the United Nations Sustainable Development Goals (SDGs).

These indicators are developed based on an international standard - Recommendation ITU-T Y.4903/L.1603 'Key performance indicators for smart sustainable cities to assess the achievement of sustainable development goals'.

United for Smart Sustainable Cities (U4SSC)

U4SSC is a UN initiative coordinated by the International Telecommunication Union (ITU), the United Nations Economic Commission for Europe (UNECE) and UN-Habitat and supported by 14 other UN Agencies and Programmes, including CBD, ECLAC, FAO, UNESCO, UNDP, UNECA, UN-Women, UN Environment, UNEP-FI, UNFCCC, UNOPS, UNIDO, UNU EGOV and WMO.

U4SSC is the global platform to advocate for public policies to encourage the use of ICTs to facilitate and ease the transition to smart sustainable cities. Find out more...

These indicators have been developed to provide cities with a consistent and standardized method to collect the necessary data to measure performance and progress with regard to:

- achieving the Sustainable Development Goals (SDGs);
- becoming a smarter city; and
- becoming a more sustainable city.

The U4SSC KPIs for SSC consist of 91 indicators. Each indicator forms part of a holistic view of a city's performance in three dimensions: **Economy**, **Environment** and **Society and Culture**. Each of these dimensions provides a separate view of progress, and when reported together they provide a holistic view of a smart sustainable city.

By providing a common set of metrics to benchmark a city's performance, the indicators will also enable cities to compare their performance to other cities, allowing for the dissemination of best practices and setting the standards for progression in meeting the Sustainable Development Goals (SDGs) at the city level.

The list of all the U4SSC KPIs for SSC, along with its collection methodology are contained in:

- The Flipbook on 'Collection Methodology for Key Performance Indicators for Smart Sustainable Cities'.

Over 100 cities worldwide are already implementing these KPIs. All cities are invited to participate in this project and to employ these KPIs.

To find out more, contact the U4SSC Secretariat at: u4ssc@itu.int.


waterbus

For more information, please contact:
u4ssc@itu.int
Website: itu.int/go/u4SSC