Verification Report

Bonao, Dominican Republic

November 2026



Municipio de Bonao

7 DE DICIEMBRE DE 1908

indotel

Instituto Dominicano de las Telecomunicaciones

GLOBAL GOALS



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11 SUSTAINABLE CITIES AND COMMUNITIES



Foreword

This publication has been developed by ITU 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 Municipality of Bonao, Dominican Republic. The U4SSC KPIs are based on Recommendation ITU-T Y.4903. 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

Any references made to specific countries, companies, products, initiatives, policies, frameworks, or guidelines do not in any way imply that they are endorsed or recommended by ITU, the authors, or any other organization that the authors are affiliated with, in preference to others of similar nature that are not mentioned.

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Bienvenidos
PLAZA DE LA

1 Introduction and Verification Background

This report contains the verification results for the KPI submission by the Municipality of Bonao 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'.

John Smiciklas, who is certified as a U4SSC Key Performance Indicators for Smart Sustainable Cities Verifier, completed the verification in October 2026.

The verification assessment activities included:

- collecting and reviewing KPI data;
- interviewing city stakeholders;
- verifying that the data submitted are in conformance with the requirements of the Collection Methodology for Key Performance Indicators for Smart Sustainable Cities; and
- preparing the Verification Report.

The verification was conducted using the information made available by the city 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.

2 KPI Reporting and Verification Summary[1]

	Total	Reported	Verified	% KPIs Verified
Economy				
Core KPIs	23	18	18	78%
Advanced KPIs	22	9	9	41%
Environment				
Core KPIs	12	6	6	50%
Advanced KPIs	5	3	3	60%
Society & Culture				
Core KPIs	19	12	12	63%
Advanced KPIs	10	6	5	50%
Overall				
Core KPIs	54	36	36	67%
Advanced KPIs	37	18	17	46%
Total	**91**	**54**	**53**	**58%**

3 KPI Data Points Reporting and Verification Summary[2]

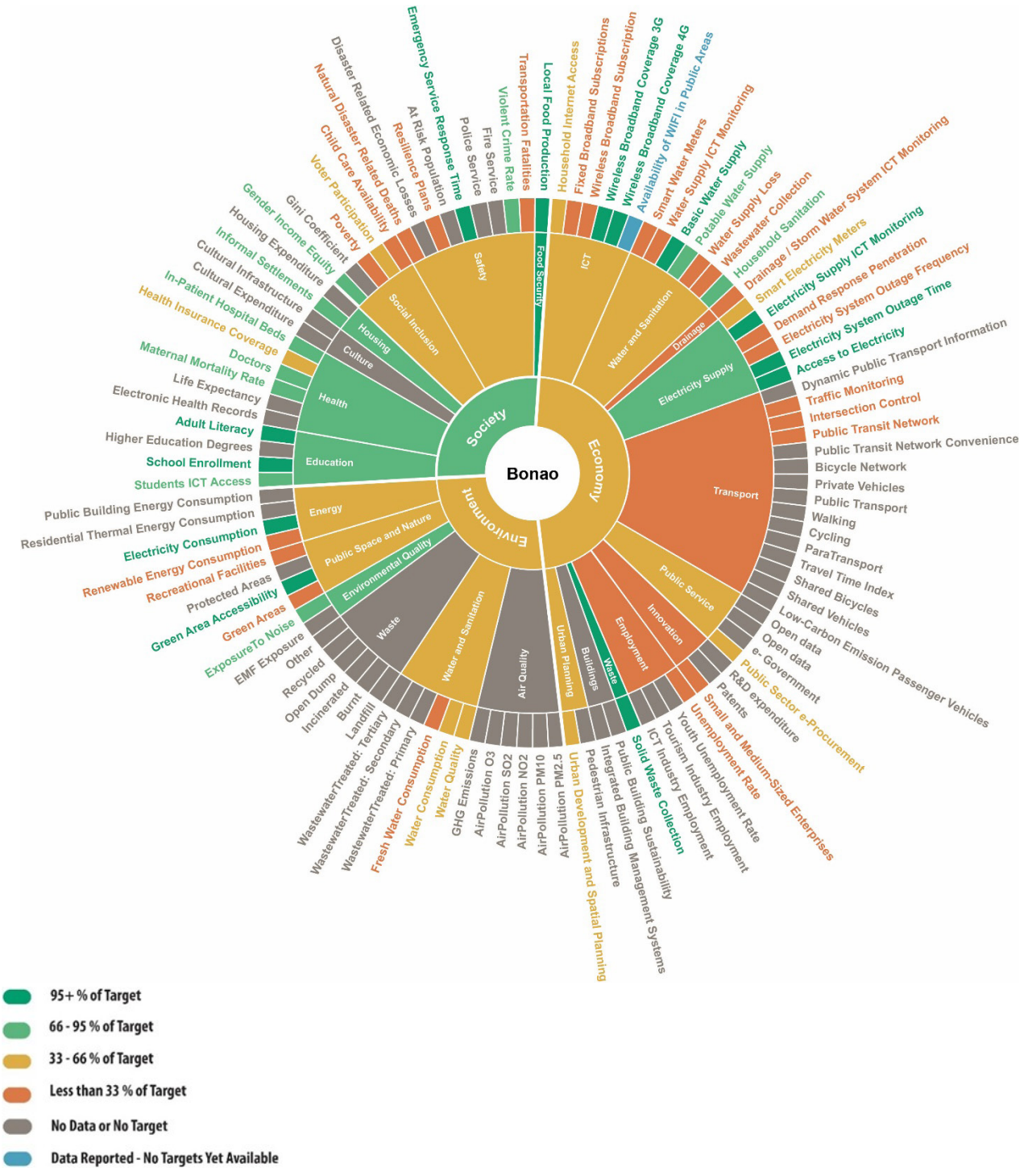
Certain KPIs are composed of more than one data point.

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

	Total	Reported	Verified	% Data Points Verified
Economy				
Core Data Points	24	19	19	79%
Advanced Data Points	31	13	13	42%
Environment				
Core Data Points	23	6	6	26%
Advanced Data Points	5	3	3	60%
Society & Culture				
Core Data Points	19	12	12	63%
Advanced Data Points	10	6	5	50%
Overall				
Core Data Points	66	37	37	56%
Advanced Data Points	46	22	21	46%
Total	**112**	**59**	**58**	**52%**

[1] SC:SH:SA:5A Emergency Services Response Time. Data were not verified
[2] SC:SH:SA:5A Emergency Services Response Time. Data were not verified

4 City Performance Benchmark



Note: Performance Benchmark Targets apply to all sections of the graphic. Starting from the centre: Dimensions, Categories and KPIs[3].

[3] SC:SH:SA:5A Emergency Services Response Time. Data were not verified but were included in the analysis

5 Benchmarks and Scoring Methodology

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

The benchmarks were set based on several factors:

- fully meeting the aligned SDG(s);
- performance compared with other international and transnational targets (e.g., OECD, European Commission);
- performance against a UN agency's goals (e.g., International Telecommunication Union);
- evaluation of city performance using UN and other international statistical data; and
- 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, subdimensions and dimensions, and were reported based on the above target scores. KPIs or data points that are not reported or have no benchmarks yet defined were excluded.

Example: Education 4 KPIs

- If all four 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 context 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 the Municipality of Bonao's reporting for each of the U4SSC KPIs within the three dimensions:

- Economy
- Environment
- Society and Culture

and the 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**	**56.99 %**	
	Fixed Broadband Subscriptions	**11.40 %**	
	Wireless Broadband Subscriptions	**5.24 / 100 000 inhabitants**	
	Wireless Broadband Coverage: 3G	**99.90 %**	
	Wireless Broadband Coverage: 4G	**98.00 %**	
	Availability of Wi-Fi in Public Areas	*4*	N/A
 WATER AND SANITATION	**Smart Water Meters**	**0.00 %**	
	Water Supply ICT Monitoring	*0.00 %*	
	Basic Water Supply	**95.00 %**	
	Potable Water Supply	**90.00 %**	
	Water Supply Loss	**20.00 %**	
	Wastewater Collection	**15.00 %**	
	Household Sanitation	**84.00 %**	
 DRAINAGE	*Drainage/Storm Water System ICT Monitoring*	*0.00 %*	

Dimension: Economy (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
ELECTRICITY SUPPLY	**Smart Electricity Meters**	**38.90 %**	
	Electricity Supply ICT Monitoring	*100.00 %*	
	Demand Response Penetration	*0.18%*	
	Electricity System Outage Frequency	**25.98**	
	Electricity System Outage Time	**10.71 Minutes**	
	Access to Electricity	**99.00 %**	

Dimension: Economy (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
TRANSPORT	**Dynamic Public Transport Information**	**NR**	
	Traffic Monitoring	**0.00 %**	
	Intersection Control	*0.00 %*	
	Public Transport Network	**22.15**	
	Public Transport Network Convenience	*NR*	
	Bicycle Network	**NR**	
	Transportation Mode Share: Private Vehicles	*NR*	
	Transportation Mode Share: Public Transport	*NR*	
	Transportation Mode Share: Walking	*NR*	
	Transportation Mode Share: Cycling	*NR*	
	Transportation Mode Share: Para Transport	*NR*	
	Travel Time Index	*NR*	
	Shared Bicycles	*NR*	
	Shared Vehicles	*NR*	
	Low-Carbon Emission Passenger Vehicles	*NR*	

Dimension: Economy (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
 PUBLIC SECTOR	*Open Data Sets Published*	*NR*	N/A
	Open Data Sets % Availability	*NR*	
	e-Government	*NR*	N/A
	Public Sector e-Procurement	*36.65 %*	
 INNOVATION	**R&D Expenditure**	**NR**	
	Patents	**NR**	
	Small and Medium-Sized Enterprises	*2.38 %*	
 EMPLOYMENT	**Unemployment Rate**	**8.60 %**	
	Youth Unemployment Rate	**NR**	
	Tourism Sector Employment	NR	
	ICT Sector Employment	NR	
 WASTE	**Solid Waste Collection**	**100.00 %**	
 BUILDINGS	*Public Building Sustainability*	*NR*	
	Integrated Building Management Systems in Public Buildings	*NR*	

Dimension: Economy (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
URBAN PLANNING	*Pedestrian Infrastructure*	*NR*	
	Urban Development and Spatial Planning: Compact	*YES*	
	Urban Development and Spatial Planning: Connected	*NO*	
	Urban Development and Spatial Planning: Integrated	*YES*	
	Urban Development and Spatial Planning: Inclusive	*YES*	
	Urban Development and Spatial Planning: Resilient	*NO*	

Dimension: Environment

CATEGORY	KPI / Data Point	Results	Benchmark
 AIR QUALITY	**Particulate Matter (PM 2.5)**	**NR**	
	Particulate Matter (PM 10)	**NR**	
	Nitrogen Dioxide (NO_2)	**NR**	
	Sulphur Dioxide (SO_2)	**NR**	
	Ozone (O_3)	**NR**	
	GHG Emissions	**NR**	
 WATER AND SANITATION	**Drinking Water Quality**	**40.00 %**	
	Water Consumption	**180.0 ℓ / day / capita**	
	Freshwater Consumption	**78.00 %**	
	Wastewater Treatment: Primary	**NR**	
	Wastewater Treatment: Secondary	**NR**	
	Wastewater Treatment: Tertiary	**NR**	

Dimension: Environment

CATEGORY	KPI / Data Point	Results	Benchmark
 WASTE	**Solid Waste: Landfill**	**NR**	
	Solid Waste: Burnt	**NR**	
	Solid Waste: Incinerated	**NR**	
	Solid Waste: Open Dump	**NR**	
	Solid Waste: Recycled	**NR**	
	Solid Waste: Other	**NR**	
 ENVIRONMENTAL QUALITY	**EMF Exposure**	**NR**	
	Noise Exposure	*22.64 %*	
 PUBLIC SPACE AND NATURE	**Green Areas**	**2.66 ha / 100 000 inhabitants**	
	Green Area Accessibility	*100.00 %*	
	Protected Natural Areas	*NR*	
	Recreational Facilities	*26 603 m² / 100 000 inhabitants*	
 ENERGY	**Renewable Energy Consumption**	**3.87 %**	
	Electricity Consumption	**963 kWh / yr / capita**	
	Residential Thermal Energy Consumption	**NR**	
	Public Building Energy Consumption	**NR**	

Dimension: Society and Culture

CATEGORY	KPI / Data Point	Results	Benchmark
 EDUCATION	**Student ICT Access**	**90.00 %**	
	School Enrolment	**98.00 %**	
	Higher Education Degrees	**NR**	
	Adult Literacy	**96.00 %**	
 HEALTH	*Electronic Health Records*	*NR*	
	Life Expectancy	**NR**	
	Maternal Mortality Rate	**33.95 / 100 000 live births**	
	Physicians	**397.85 / 100 000 inhabitants**	
	In-Patient Hospital Beds	*244.95 / 100 000 inhabitants*	
	Health insurance/ Public Health Coverage	*65.00 %*	
 CULTURE	**Cultural Expenditure**	**NR**	
	Cultural Infrastructure	*NR*	N/A
 HOUSING	**Informal Settlements**	**1.50 %**	
	Housing Expenditure	*NR*	

Dimension: Society and Culture (continued)

CATEGORY	KPI / Data Point	Results	Benchmark
 SOCIAL INCLUSION	**Gender Income Equity**	**0.92**	
	Gini Coefficient	**NR**	
	Poverty Rate	**14.60%**	
	Voter Participation	**36.21%**	
	Childcare Availability	*4.10 %*	
 SAFETY	**Natural Disaster-Related Deaths**	**3.45/ 100 000 inhabitants**	
	Disaster-Related Economic Losses	**NR**	
	Resilience Plans	*NO*	
	Population Living in Disaster-Prone Areas	*NR*	
	Emergency Service Response Time	*0.67 Minutes*[4]	
	Police Service	**NR**	
	Fire Service	**NR**	
	Violent Crime Rate	**181.84 / 100 000 inhabitants**	
	Traffic Fatalities	**34.88 / 100 000 inhabitants**	

[4] Not Verified

CATEGORY	KPI / Data Point	Results	Benchmark
 FOOD SECURITY	*Local Food Production*	*100.00 %*	

7 KPIs / Data Points Not Reported

KPI Number	Description
EC: ICT: T: 1C	Dynamic Public Transport Information
EC: I: T: 2A	Public Transit Network Convenience
EC: I: T: 3C	Bicycle Network
EC: I: T: 4A	Transportation Mode Share Private Vehicles
EC: I: T: 4A	Transportation Mode Share Public Transport
EC: I: T: 4A	Transportation Mode Share Walking
EC: I: T: 4A	Transportation Mode Share Cycling
EC: I: T: 4A	Transportation Mode Share Para Transport
EC: I: T: 5A	Travel Time Index
EC: I: T: 6A	Shared Bicycles
EC: I: T: 7A	Shared Vehicles
EC: I: T: 8A	Low-Carbon Emission Vehicles
EC: ICT: PS: 1A	Open data
EC: ICT: PS: 2A	e- Government
EC: P: IN: 1C	R&D expenditure
EC: P: IN: 2C	Patents
EC: P: EM: 2C	Youth Unemployment Rate
EC: P: EM: 3A	Tourism Industry Employment
EC: P: EM: 4A	ICT Industry Employment
EC: I: B: 1A	Public Building Sustainability
EC: I: B: 2A	Integrated Building Management Systems
EC: I: UP: 1A	Pedestrian infrastructure
EN: EN: AQ: 1C	Air Pollution PM2.5
EN: EN: AQ: 1C	Air Pollution PM10
EN: EN: AQ: 1C	Air Pollution NO2
EN: EN: AQ: 1C	Air Pollution SO2
EN: EN: AQ: 1C	Air Pollution O3

KPI Number	Description
EN: EN: AQ: 2C	GHG Emissions
EN: EN: WS: 4C	Wastewater Treated Primary
EN: EN: WS: 4C	Wastewater Treated Secondary
EN: EN: WS: 4C	Wastewater Treated Tertiary
EN: EN: WA: 1C	Solid Waste Treatment Landfill
EN: EN: WA: 1C	Solid Waste Treatment Burnt
EN: EN: WA: 1C	Solid Waste Treatment Incinerated
EN: EN: WA: 1C	Solid Waste Treatment Open Dump
EN: EN: WA: 1C	Solid Waste Treatment Recycled
EN: EN: WA: 1C	Solid Waste Treatment Other
EN: EN: EQ: 1C	EMF Exposure
EN: EN: PSN: 3A	Protected Areas
EN: E: E: 3C	Residential Thermal Energy Consumption
EN: E: E: 4A	Public Building Energy Consumption
SC: EH: ED: 3C	Higher Education Degrees
SC: EH: H: 6A	Electronic Health Records
SC: EH: H:1C	Life Expectancy
SA: EH: C: 1C	Cultural Expenditure
SC: EH: C: 2A	Cultural Infrastructure
SC: SH: HO: 2A	Housing Expenditure
SC: SH: SI: 2C	Gini Coefficient
SC: SH: SA: 2C	Disaster Related Economic Losses
SC: SH: SA: 4A	At Risk Population
SC: SH: SA: 6C	Police Service
SC: SH: SA: 7C	Fire Service

8 KPIs Not Verified

SC: SH: SA: 5A	Emergency Services Response Time

9 Next Steps

Identify KPIs that require improvement

The Municipality of Bonao should review the KPIs that achieved results within the 0–33% and 33–66% benchmark ranges established by ITU, identify those that represent the most significant challenges for the municipality, and define concrete actions for improvement, prioritizing those that directly affect citizens' quality of life.

Complete the information for KPIs with missing data

The Municipality of Bonao should identify the KPIs that could not be reported due to missing information, determine which municipal departments or public institutions can provide the required data, and establish coordination mechanisms to collect and include this information in future assessments.

Maintain regular updates of KPI data

The Municipality of Bonao should continue collecting and periodically updating KPI data, comparing new results with previous assessments to identify progress, setbacks, and areas requiring further attention. This information will help evaluate municipal improvements and support evidence-based decision-making.

Continue participating in the ITU and U4SSC initiatives

The Municipality of Bonao should remain actively engaged in the United for Smart Sustainable Cities (U4SSC) initiative, sharing its progress, challenges, and experiences with ITU in coordination with INDOTEL, while providing feedback and recommendations to improve the KPIs and their application within the municipality.

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).

United for Smart Sustainable Cities (U4SSC)

A United Nations Platform Empowering Cities and Communities

The United for Smart Sustainable Cities (U4SSC) initiative is a global UN collaboration coordinated by ITU, UN-Habitat and UNECE, and supported by a wide network of partners, including: CBD, ECLAC, FAO, UNDESA, UNDP, UNECA, UNESCO, UNEP, UNEP-FI, UNFCCC, UNFPA, UNIDO, UNITAR, UNJSPF, UNOP, UNU-EGOV, UN-Women, UNWTO, and WMO.

U4SSC serves as a dynamic international platform for the exchange of knowledge, best practices, and policy innovation – uniting cities, governments, academia, industry, and civil society to co-create people-centred, digitally inclusive, and climate-resilient cities and communities to advance the Sustainable Development Goals, the Global Digital Compact, and the Pact for the Future. Find out more…

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

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 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 with those of 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 the 'Collection Methodology for Key Performance Indicators for Smart Sustainable Cities'.

More than 350 cities worldwide are already implementing these KPIs. All cities are invited to participate in this project and employ these KPIs.

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



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