

Verification Report

Bærum

March 2020



GLOBAL GOALS



**11 SUSTAINABLE CITIES
AND COMMUNITIES**



Contents

1. Introduction and Verification Background 6
2. KPI Reporting and Verification Summary 7
3. KPI Data Points Reporting and Verification Summary 7
4. City Performance Benchmark 8
5. Benchmarks and Scoring Methodology 9
6. Verification Results 10
7. KPIs Not Reported 22
8. KPIs Not Verified 22
9. Next Steps 22
10. Using KPIs for SSC to Reach the SDGs 23

FINAL DRAFT

FINAL DRAFT

1. Introduction and Verification Background

This report contains the verification results for the KPI submission by the city of Bærum 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 remote verification in March 2020 .

The verification assessment activities included:

- collecting and reviewing KPI data;
- interviewing city stakeholders;
- verifying the data submitted is 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 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

	Total	Reported	Verified	% KPIs Verified
Economy				
Core KPIs	23	22	22	96%
Advanced KPIs	22	21	21	95%
Environment				
Core KPIs	12	11	11	92%
Advanced KPIs	5	5	5	100%
Society & Culture				
Core KPIs	19	19	19	100%
Advanced KPIs	10	9	9	90%
Overall				
Core KPIs	54	52	52	96%
Advanced KPIs	37	35	35	96%
Total	91	87	87	96%

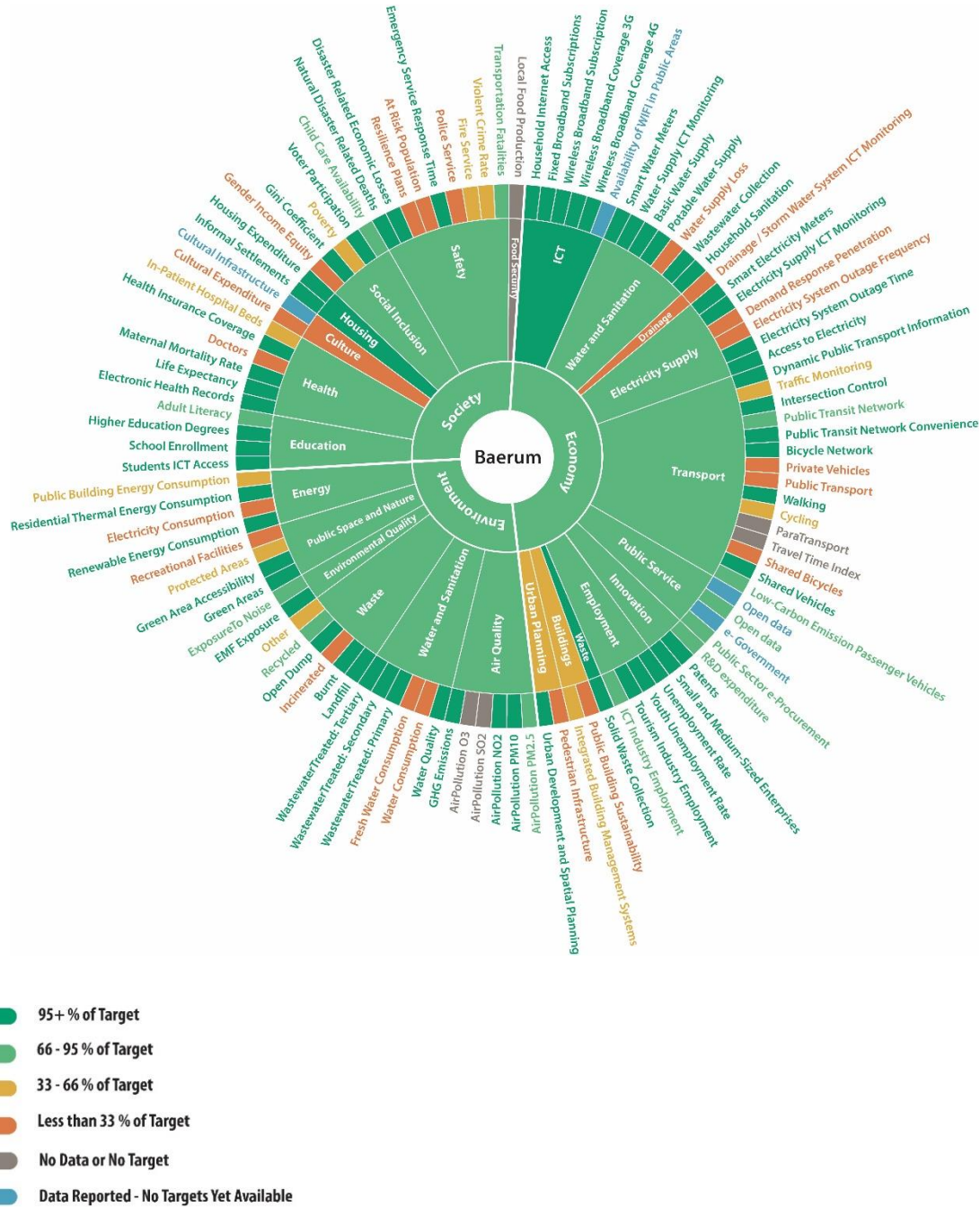
3. KPI Data Points Reporting and Verification Summary

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	24	24	100%
Advanced Data Points	31	29	29	94%
Environment				
Core Data Points	23	21	21	91%
Advanced Data Points	5	5	5	100%
Society & Culture				
Core Data Points	19	19	19	100%
Advanced Data Points	10	9	9	90%
Overall				
Core Data Points	66	64	64	97%
Advanced Data Points	46	43	43	93%
Total	112	107	107	96%

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 Telecommunicator 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 datapoint were added to give a percentage score for categories, subdimensions 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 to other similar cities to determine future actions.

6. Verification Results

This section contains the data and results of the verification for Bærum 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 both the Economy and 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	98.00 %	
	Fixed Broadband Subscriptions	86.56 %	
	Wireless Broadband Subscriptions	114 397 / 100 000 inhabitants	
	Wireless Broadband Coverage: 3G	99.02 %	
	Wireless Broadband Coverage: 4G	99.02 %	
	Availability of WIFI in Public Areas	153	N/A
 WATER AND SANITATION	Smart Water Meters	100.00 %	
	Water Supply ICT Monitoring	100.00 %	
	Basic Water Supply	100.00 %	
	Potable Water Supply	99.20 %	
	Water Supply Loss	34.70 %	
	Wastewater Collection	99.21 %	
	Household Sanitation	100.00 %	















CATEGORY	KPI / Data Point	Results	Benchmark
 DRAINAGE	<i>Drainage/Storm Water System ICT Monitoring</i>	0.00%	
 ELECTRICITY SUPPLY	Smart Electricity Meters	100.00 %	
	<i>Electricity Supply ICT Monitoring</i>	100.00 %	
	<i>Demand Response Penetration</i>	0.07 %	
	Electricity System Outage Frequency	1.75	
	Electricity System Outage Time	43.90 Minutes	
	Access to Electricity	100.00 %	













CATEGORY	KPI / Data Point	Results	Benchmark
 <p>TRANSPORT</p>	Dynamic Public Transport Information	100.00 %	
	Traffic Monitoring	42.74 %	
	Intersection Control	100.00 %	
	Public Transport Network	149.79 km / 100 000 inhabitants	
	Public Transport Network Convenience	95.62 %	
	Bicycle Network	207.10 km / 100 000 inhabitants	
	Transportation Mode Share: Private Vehicles	57.00 %	
	Transportation Mode Share Public Transport	18.00 %	
	Transportation Mode Share Walking	20.00 %	
	Transportation Mode Share Cycling	4.00 %	
	Transportation Mode Share Para Transport	Not Reported	
	Travel Time Index	Not Reported	
	Shared Bicycles	94.61 / 100 000 inhabitants	
	Shared Vehicles	284.61 / 100 000 inhabitants	
Low-Carbon Emission Passenger Vehicles	9.18 %		






CATEGORY	KPI / Data Point	Results	Benchmark
 PUBLIC SECTOR	<i>Open Data Sets Published</i>	149	N/A
	<i>Open Data Sets % Availability</i>	93.71 %	
	<i>e-Government</i>	146 Services	N/A
	<i>Public Sector e-Procurement</i>	84.09 %	
 INNOVATION	R&D Expenditure	2.53 % GDP	
	Patents	44.15 / 100,000 inhabitants	
	<i>Small and Medium-Sized Enterprises</i>	99.34 %	
 EMPLOYMENT	Unemployment Rate	1.72 %	
	Youth Unemployment Rate	1.44 %	
	<i>Tourism Sector Employment</i>	4.29 %	
	<i>ICT Sector Employment</i>	5.86 %	
 WASTE	Solid Waste Collection	100.00 %	

CATEGORY	KPI / Data Point	Results	Benchmark
 BUILDINGS	<i>Public Building Sustainability</i>	1.96 %	   
	<i>Integrated Building Management Systems in Public Buildings</i>	44.76 %	   
 URBAN PLANNING	<i>Pedestrian Infrastructure</i>	0.00 %	   
	<i>Urban Development and Spatial Planning: Compact</i>	YES	   
	<i>Urban Development and Spatial Planning: Connected</i>	YES	
	<i>Urban Development and Spatial Planning: Integrated</i>	YES	
	<i>Urban Development and Spatial Planning: Inclusive</i>	YES	
	<i>Urban Development and Spatial Planning: Resilient</i>	YES	

Dimension: Environment















CATEGORY	KPI / Data Point	Results	Benchmark
 AIR QUALITY	Particulate Matter (PM 2.5)	11.00 µg / m ³	
	Particulate Matter (PM 10)	20.00 µg / m ³	
	Nitrogen Dioxide (NO ₂)	29.00 µg / m ³	
	Sulphur Dioxide (SO ₂)	Not Reported	
	Ozone (O ₃)	Not Reported	
	GHG Emissions	1.27 tonnes eCO ₂ / capita	
 WATER AND SANITATION	Drinking Water Quality	99.21 %	
	Water Consumption	263.25 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	2.98 %	
	Solid Waste: Burnt	0.00 %	
	Solid Waste: Incinerated	44.19 %	
	Solid Waste: Open Dump	0.00 %	
	Solid Waste: Recycled	50.49 %	
	Solid Waste: Other	2.34 %	
 ENVIRONMENTAL QUALITY	EMF Exposure	100.00 %	
	Noise Exposure	19.40 %	
 PUBLIC SPACE AND NATURE	Green Areas	10 553 ha / 100 000 inhabitants	
	Green Area Accessibility	99.75 %	
	Protected Natural Areas	7.50 %	
	Recreational Facilities:	86 331 m ² / 100 000 inhabitants	










CATEGORY	KPI / Data Point	Results	Benchmark
 ENERGY	Renewable Energy Consumption	100.00 %	
	Electricity Consumption	12 872 kWh / yr. / capita	
	Residential Thermal Energy Consumption	1.99 GJ / yr. / capita	
	Public Building Energy Consumption	168.11 kWh / m ² / yr.	













FINAL DRAFT

Dimension: Society and Culture

CATEGORY	KPI / Data Point	Results	Benchmark
 EDUCATION	Student ICT Access	100.00 %	
	School Enrollment	101.63 %	
	Higher Education Degrees	12 872 / 100 000 inhabitants	
	Adult Literacy	94.80 %	
 HEALTH	<i>Electronic Health Records</i>	99.90 %	
	Life Expectancy	83.05 Years	
	Maternal Mortality Rate	0.00 / 100 000 live births	
	Physicians	109.59 / 100 000 inhabitants	
	<i>In-Patient Hospital Beds</i>	190.30 / 100 000 inhabitants	
	<i>Health insurance / Public Health Coverage</i>	100.00 %	
 CULTURE	Cultural Expenditure	0.02 % ¹	
	<i>Cultural Infrastructure</i>	99.34 / 100 000 inhabitants	N/A

¹ In Norway, cultural expenditure is mainly a function of higher levels of government so that municipal contribution does not capture the full expenditure

CATEGORY	KPI / Data Point	Results	Benchmark
 HOUSING	Informal Settlements	0.04 %	
	<i>Housing Expenditure</i>	16.57 %	
 SOCIAL INCLUSION	Gender Income Equity	0.62 Ratio Female: Male	
	Gini Coefficient	0.32	
	Poverty Rate	5.00 %	
	Voter Participation	70.66 %	
	<i>Child Care Availability</i>	93.39 %	

CATEGORY	KPI / Data Point	Results	Benchmark
 SAFETY	Natural Disaster Related Deaths	0.00 / 100 000 inhabitants	
	Disaster Related Economic Losses	0.00% / City GDP	
	Resilience Plans	No ²	
	Population Living in Disaster Prone Areas	11.53 %	
	Emergency Service Response Time	4.66 Minutes	
	Police Service	91.42 FTE / 100 000 inhabitants ³	
	Fire Service:	61.02 FTE / 100 000 inhabitants	
	Violent Crime Rate	454.90 / 100 000 inhabitants	
	Traffic Fatalities	0.79 / 100 000 inhabitants	
 FOOD SECURITY	Local Food Production:	Not reported	

² Municipalities in Norway will have resilience planning in place; however, they do not yet use the Sendai framework

³ Police officers serve Bærum, Asker and four districts of Oslo: District Vestre Aker, Nordre Aker, Frogner and Ullern. KPI is reported based on the population of the entire district

7. KPIs Not Reported

KPI Number	Description
EC: I: T: 5A	Travel Time Index
SC: SH: FS: 1A	Local Food Production
EN: EN: AQ: 1C	Partial - Following not reported Sulphur Dioxide (SO ₂) Ozone (O ₃)
EC: I: T: 4A	Partial - Following not reported Para Transport Bærum is able to collect the number of people with access to a para transport card (TT Card). Reported 0.85% The TT Card is usually used for discounted taxi fares as there is no dedicated para transport system. However, access is not the same as usage.

8. KPIs Not Verified

All reported KPIs were verified

9. Next Steps

Bærum 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.

Bærum is encouraged to review the KPIs for which no data was reported and determine plans for future data collection and reporting.

Bærum is encouraged to continue ongoing data collection to determine trends in performance against benchmarks over time.

Bærum 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’.

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 employ these KPIs.

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