SCTool MED

Sustainable Cities Tool

Integrated tool and assessment methodology for sustainable Cities in MED Countries

Version : 2023-A





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Introduction

Sustainability assessment method for the cities built environment



SCTool MED is an assessment system for measuring the sustainability of Mediterranean cities. It can be used by urban planners to support integrative planning processes and by public authorities to establish performance targets in policies, programs, and action plans. SCTool MED can be contextualized and adapted to any Mediterranean city. It is based on a transnational methodology, the SBE Method, developed through the international research process Green Building Challenge launched in 1998 and coordinated by iiSBE (international initiative for a Sustainable Built Environment). Over time, more than 25 national teams from all the continents contributed to the development of SBE Method and tested it the on hundreds of case studies. SBE Method is based on the "think globally, act locally" concept, acting as a common "language" for assessing the sustainability of the built environment. An assessment tool using the SBE Method, such as SCTool, can be adapted to any context reflecting local priorities and peculiarities. The use of SCTool MED allows to evaluate, compare, and aggregate the results of sustainability measures deployed locally and, at the same time, to evaluate the progress towards the global sustainability targets, avoiding the uncertainty and confusion generated using different assessment tools. Any public authority can develop its own SCTool MED that will provide sustainability assessment results comparable and aggregable with the results of any other local version of the tool. The project Sustainable MED Cities developed the first assessment tool at city scale based on SBMethod. SCTool MED has been used to improve the framework of sustainability indicators of the Istanbul Environment Friendly Cities Award promoted by UNEP/MAP. SCTool MED is applicable to the whole Mediterranean region, taking in account the specific issues of the North, South and East shores. This publication illustrates the SBE Method, how to contextualise SCTool MED to a specific city, and how to carry out a sustainability assessment using it. The use of the MED Passport and KPIs for comparing the sustainability of Mediterranean cities is also explained. SCTool MED is freely available to any municipality in the Mediterranean willing to develop its own sustainability assessment tool at city scale. The use of SCTool MED contributes to the achievement of the objectives of the Mediterranean Strategy for Sustainable Development.

Andrea Moro

WP3 Coordinator iiSBE Italia R&D

1. SBE Method

Sustainable Built Environment Method



Main elements:

1. A set of assessment criteria. 2. A set of indicators, which allow to quantify the cities performances with respect to each criterion. 3. A normalisation method. 4. An aggregation method.



SCTool MED



SBE Method is a multi-criteria analysis method for assessing the sustainability of the built environment.

Starting from a set of assessment criteria, SBE Method provides a final concise score about a cities overall sustainability.

1.1 Hierarchic levels

hierarchic levels:

1. Issues 2. Categories

3. Criteria

4. Indicators

The multicriteria analysis method is structured in four

Categories Issues Describe general themes, recognised as relevant for assessing the sustainability of a city. For instance, the issues of SCTool are: A.1 Use of land mobility service A.2 Green urban areas A.3 Biodiversity and ecosystems A - Use of land and biodiversity F - Transportation and mobility **B.1** Energy infrastructure B.2 Energy consump-(4) B - Energy G - Social Aspects tions G.2 Housing -B.3 Renewable energy C - Water H - Economy C.1 Water infrastructure G.4 Education C.2 Water consump-D - Solid Waste I - Climate Change: tion mitigation and adaptation Ŵ C.3 Effluents managa-G.6 Safety ment



E Environmental quality

- Governance

(\$)

H.4 ICT infrastructure

8

×

D.1 Solid waste collec-

tion infrastructure

D.2 Solid wate man-

E.3 EMF expossure

agement

E.2 Noise

–E.1 Air quality

Concern particular aspects of issues. For instance, in the SCTool, the issue A-Use of land and biodiversity contains 3 categories: A1-Use of land, A2- Green urban areas and A3- Biodiversity and ecosystems.

–F.1 Performance of

F.2 Green mobility

-F.3 Safety in mobility

-G.1 Performance of mobility services

G.3 Availability of public and private facilities and services



ĬĨĨ

G.5 Social inclusion

G.7 Helath

-G.8 Food security

H.1 Economic Performance

H.2 Employment

H.3 Innovation

-I.1 Climate change mitigation

I.2 Adaptation to the climate action: heatwaves and increase of temperature

I.3 Adaptation to the climatic action: pluvial flood

I.4 Adaptation to the climatic action:fluvial and coastal flood

I.5 Adaptation to the climatic action: drought

I.6 Adaptation to the climatic hazard: wildfire

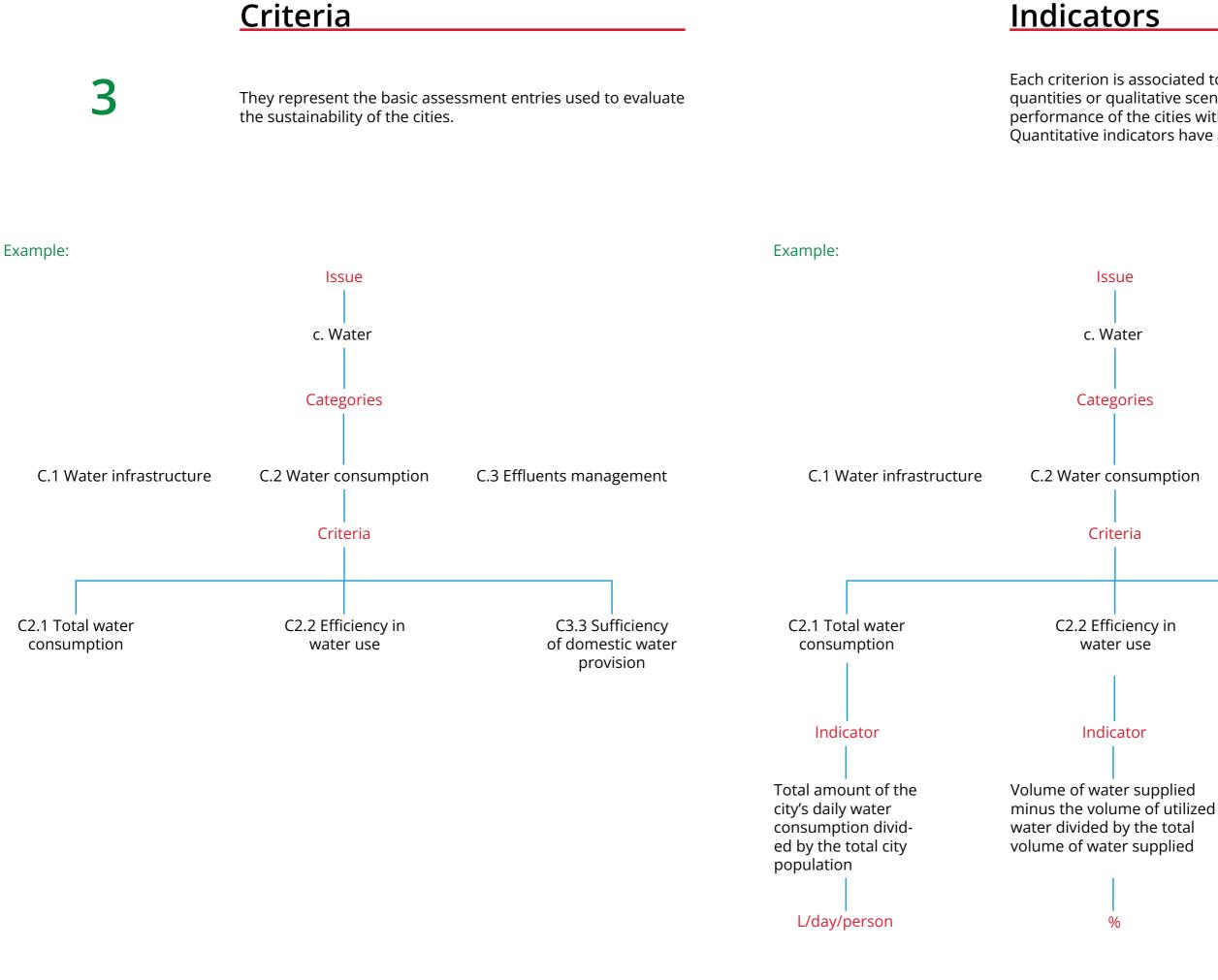
_J.1 Urban planning

J.2 Management and community involvement

J.3 Public buildings cooperation

–J.4 Equity

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SCTool MED

Each criterion is associated to an indicator. They are physical quantities or qualitative scenarios that allow to assess the performance of the cities with respect to the criteria. Quantitative indicators have a unit of measure.

C.3 Effluents management

C3.3 Sufficiency of domestic water provision

Indicator

Volume of the water supplied for domestic uses divided by the overall domestic water demand

%

Definition and objective:

ies with respect to all criteria.

1. Characterization

Calculation/evaluation of the indicators' value.

2. Normalisation

Assignment of a score to the indicators' value.

3 Aggregation

Weighted sum of criteria's scores to calculate the score of categories, issues.

1.2 Assessment process

SCTool MED

The main goal of the SBEMethod is to provide a final concise score, which summarises the overall performance of the cit-

The assessment procedure is articulated in 3 main steps:

Input Experimental data Design data Output Indicators' values and selected escenarios

Input Indicators' values and selected escenarios Output Normalized scores

Input Normalised scores Output Final concise score

Step 1: Characterisation

In the first stage of the assessment process, the values of all the quantitative indicators in SCTool are calculated.

For each criterion, SCTool provides the description of an "Assessment Method" that specifies the calculation procedure.

For the qualitative indicators, the performance of the city is assessed through the selection of a reference scenario.

Examp	ole:			
Code	Criterion	Indicator	Unit of measure	Value
A3.1	Variation of the number of bird species	Percentage change in the number of bird species	%	55
B2.2	Residential final thermal energy consumption	Total consumption of final thermal en- ergy divided by the total number of city inhabitants	MWh/ inhabi- tant/yr	195
C3.2	Household sanitation	Percentage of households with access to basic sanitation facilities	%	93
D1.1	Availability of solid waste collection	Percentage of population with regular solid waste collection	%	81
E1.2	Particulate matter (PM ₁₀) concentration	Annual average fine particulate matter (PM ₁₀) concentration	µg/m³	230
F2.6	Green public vehicles	Total number of low emission public ve- hicles divided by total number of public vehicles	%	43
G1.3	Accessibility of public transport network	Percentage of public transport vehicles that are accessible disabled persons	%	66
H4.2	Wireless Broadband Cov- erage	Percentage of the city served by wire- less broadband (3G, 4G, 5G)	%	23
14.1	Flood risk	Percentage of population exposed to flood risk	%	17
J2.1	Involvement of residents in community affairs	Percentage of resident population above 16 years having an involvement in community affairs	%	57
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Step 2: Normalisation

Scoring scale:

SCTool MED

In the second stage of the assessment process, a performance score is associated to the value or scenario of each indicator. This process is named "normalisation". The indicators are normalised in the interval (-1,+5), where -1 corresponds to a negative performance and +5 to an excellent performance. The better the performance, the higher the normalised score. The values of quantitative indicators are normalised through linear functions of two kinds: H.I.B. (High Is Better) and L.I.B. (Low is Better). Qualitative indicators are normalised using discrete values corresponding to the reference scenarios.

For each indicator, the normalisation function depends on two parameters: the thresholds assigned to score 0 and 5. These parameters are named "benchmarks" and they define the value or scenario of the indicator associated to the "minimum acceptable performance" (score zero) and to the "excellent and ideal performance" (score five).

-1	The score corresponds der the minimum accep
0	The score corresponds resents the minimum ac defined on the base of r
1	The score corresponds resents a minimum incr the minimum acceptabl
2	The score corresponds resents a substantial inc minimum acceptable pe
3	The score corresponds resents a best practice.
4	The score corresponds resents an improvemen
5	The score corresponds resents an excellent and

ls to a value of the indicator that is uneptable performance.

ls to a value of the indicator that repacceptable performance. It is usually of regulations and standards.

ls to a value of the indicator that repncrease of performance with regards to able performance.

ls to a value of the indicator that repincrease of performance with to the performance.

ls to a value of the indicator that repe.

ls to a value of the indicator that repent towards the best practice level.

ls to a value of the indicator that repind ideal performance.

Normalisation H.I.B. Criteria (Higher Is Better)

All criteria such that the higher the numerical value of the corresponding indicator, the higher the performance level.

Since the normalised score must fulfil the requirement "the better the performance, the higher the normalized score", normalisation functions associated with H.I.B. criteria must be increasing functions.

The normalised score is -1 if the value of the indicator is lower than the benchmark corresponding to score 0.

The normalised score is 5 if the value of the indicator is equal of higher than the benchmark corresponding to score 5.

In the other cases, the value of the indicator is normalised through an interpolation.

Normalisation L.I.B. Criteria (Lower Is Better)

All criteria such that the lower the numerical value of the corresponding indicator, the higher the performance level. Normalisation functions associated with L.I.B. criteria must be decreasing functions.

The normalised score is 5 if the value of the indicator is equal or lower than the benchmark corresponding to score 5.

The normalised score is -1 if the value of the indicator is higher than the benchmark corresponding to score 0.

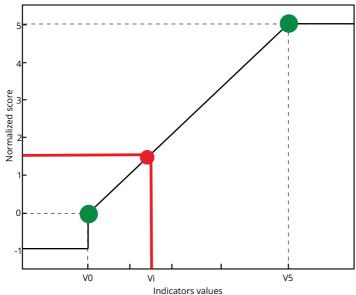
In the other cases, the value of the indicator is normalised through an interpolation.

Base representation:

V0 = value of the indicator for benchmark zero

V5 = value of the indicator for benchmark five

Vi = value of the indicator

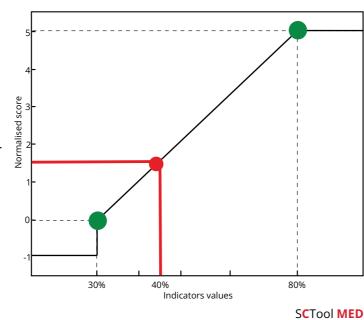


Example:

Criterion: A3.1 - Variation of the number of bird species

Indicator: Percentage change in the number of bird species.

Value of the indicator: 40% Normalised score: 1,5



Base representation:

V0 = value of the indicator for benchmark zero

V5 = value of the indicator for benchmark five

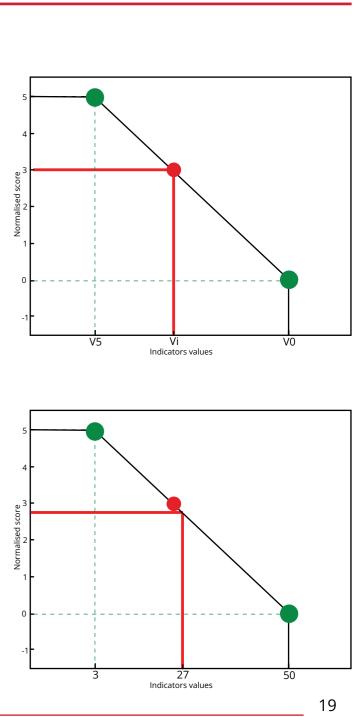
Vi = value of the indicator

Example:

Criterion: E1.2 - Particulate matter (PM₁₀) concentration

Indicator: Annual average fine particulate matter (PM₁₀) concentration

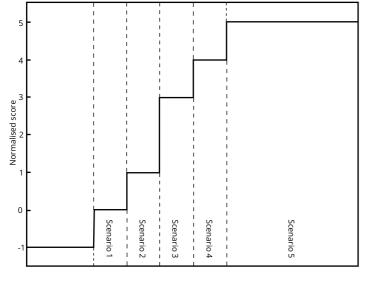
Value of the indicator: 27 µg/m³ Normalised score: 2,7



Normalisation qualitative criteria

All criteria such that the normalised score can only attain discrete values in the normalisation interval, each of them corresponding to a reference scenario defined by the corresponding indicator.

The normalised score is computed by comparing the neighbourhood's performance with reference scenarios which are defined by the indicator associated with the criterion.



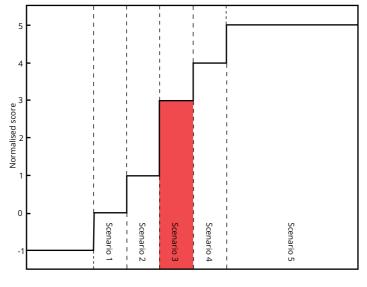
Indicators values

Example:

Criterion:

Community involvement in urban planning activities

Normalisation of the indicator's value: 3



Indicators values

SCTool MED

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Step 3: Aggregation

In the third step the normalised scores of criteria are aggregated to calculate the overall sustainability score of the city.

The aggregation takes place in 3 phases:

3.1 Aggregation through criteria: the scores of the criteria in the same category are aggregated to calculate the score of each category.

3.2 Aggregation though categories: the scores of the categories in the same issue are aggregated to calculate the score of each issue.

3.3 Aggregation through issues: the scores of the issues are aggregated to calculate the overall sustainability score of the city.

In what follows are used the symbols:

a. Xi the i-th issue. The issues in SCTool are 10, consequently i=1,10. NI is the number of the issues included in SNTool

b. $C_{i,j}$ the j-th category of the issue X_i, j=1,, N_c⁽ⁱ⁾, where N_c⁽ⁱ⁾ is the number of the categories in the i-th issue

c. $c_{i,j,k}$ is the k-th criterion of the j-th category in the i-th issue, k=1,...... $N_{c}^{(l,j)}$, where $N_{c}^{(l,j)}$ is the number of the criteria in the category C_{ii}

Through criteria

The main goal of aggregation through criteria is to provide a single normalised score for each category. This is computed for each category aggregating the normalised score of all criteria included in that category.

Aggregation is performed by linear aggregation of scores through weights. These quantify the relative weight of each criterion in percentage with respect to all criteria in the same category.

$$S_{i,j} = \sum_{k=1}^{N_c^{(i,j)}}$$

 $\omega_{i,j,k}$: the weight of the criterion ci,j,k in the category $C_{i,j}$ si,j,k: the score of the criterion ci,j,k in the category Ci,j Sij: the score of resulting from the aggregation of criteria's scores included in the category Cij.

Example

Calculation of the score for the SCTool category G2 Housing:

Code	Criteria	Score	Weight
G2.1	Affordability of housing property	3,1	24%
G2.2	Affordability of housing rental	2,2	34%
G2.3	Vacant residential units	1,3	16%
G2.4	Informal settlements	0,5	26%

Calculation of the category's score as weighted sum:

Code	Criteria	Score X Weight	Weighted Score
G2.1	Affordability of housing property	3,1*0,24	0,7
G2.2	Affordability of housing rental	2,2*0,34	0,8
G2.3	Vacant residential units	1,3*0,16	0,2
G2.4	Informal settlements	0,5*0,26	0,1
	Score of t	he category	1,8

 $W_{i,j,k}$ Si, j, k

Through categories

The scores of categories are aggregated to calculate the score of each issue (A,B,C,D,E,F,G,H,I,J). The calculation consists in a linear aggregation of the scores of the categories included in that issue.

w_{i,j}: the weight of each category included in issue Xi;

S_{ii}: the score of each category included in issue Xi;

S: the score resulting from the aggregation of the categorie's scores included in issue Xi.

$$S_i = \sum_{j=1}^{N_c^{(i,j)}} w_{i,j \, Si,j}$$

Example:

calculation of the score for the SCTool issue G **Social Aspects:**

Code	Category	Score	Weight
G1	Performance of mobility services	1,6	12%
G2	Housing	2,6	8%
G3	Availability of public and private facilities and services	2,2	20%
G4	Education	3,2	15%
G5	Social inclusion	2,3	12%
G6	Safety	1,5	5%
G7	Health	3,8	20%
G8	Food security	4,1	8%

Calculation of the issue's score as weighted sum:

Code	Category	Score X Weight	Weighted Score
G1	Performance of mobility services	1,6*0,12	0,19
G2	Housing	2,6*0,08	0,04
G3	Availability of public and private facilities and services	2,2*0,2	0,44
G4	Education	3,2*0,15	0,48
G5	Social inclusion	2,3*0,12	0,27
G6	Safety	1,5*0,05	0,07
G7	Health	3,8*0,2	0,76
G8	Food security	4,1*0,08	0,32

Total score of the issue

Through issues

The scores of issues are aggregated to calculate the overall sustainability score of the city). The calculation consists in a linear aggregation of the scores of the issues include in SCTool.

W_i = the weight of each issue included in SCTool

S_i = the score of each issue included in SCTool



Example:

_Calculation of the first trhee issues overall score for a **<u>City</u>**:

Code	lssue	Score	Weight
А	Use of land and biodiversity	2,2	8%
В	Energy	1,9	13%
С	Water	2,3	10%

_Calculation of the issues overall score as weighted sum:

Code	lssue
А	Use of land and biodiversity
В	Energy
С	Water
	Su

2,57

$$W_{i,si}$$

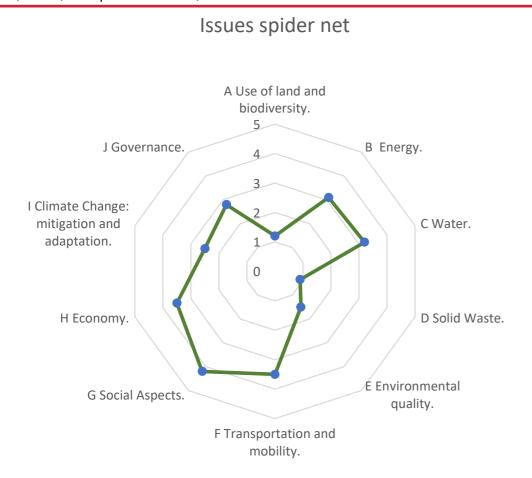
	Score X Weight	Weighted Score
,	2,2*0,08	0,2
	1,9*1,3	0,2
	2,3*0,1	0,2
ustainabi	ility score	0,6

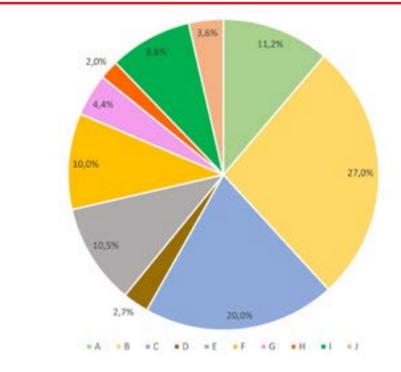
Assessment`s results

Spider chart:

Easy-to-read representation of the 10 issues score on a scale from 0 (minimum acceptable performance) to 5 (best performance).

Pie chart: Percentual contribution weight of each issue to the overall score.





Final score:

Detail of the scores and weights for the 10 issues and overall score.

lssue	Score	Weight	Weighted scores
A Use of land and biodiversity.	1,2	11,2%	0,13
B Energy	3,1	27,0%	0,83
C Water	3,2	20,0%	0,64
D Solid Waste.	0,9	2,7%	0,02
E Environmental quality.	1,5	10,5%	0,45
F Transportation and mobility.	3,5	10,0%	0,15
G Social Aspects.	4,2	4,4%	0,18
H Economy.	3,5	2,0%	0,07
I Climate Change: mitigation and adaptation.	2,5	8,6%	0,21
J Governance.	2,8	3,6%	0,10
		100% Total weight	2,78/5 Total score

Number of active indicators:

Total number of indicators available in SCTool and number of indicators selected (including KPI- key performance indicators) in the assessment.

The number available criteria	99	The number active criteria	80
is:		is:	

27

Description of the KPIs:

Value of Key performance indicators.

Example:

	KPIs City scale	Value	Unit of measure
A2.1	Availability of Green Urban Areas	40	%
B2.1	Final energy consumption	11	MWh/inhabitant/yr
B3.1	Final energy derived from renewable sources	50	%
C2.1	Total water consumption	100	L/day/person
D2.2	Solid waste recycling	70%	%
E1.2	Particulate matter (PM ₁₀) concentration	22	µg/m³
F1.1	Public transport network	40	km/1000 inhabitants
F2.4	Bicycle network	15	m/inhabitant
11.1	Greenhouse gas emissions	5	t CO _{2 eq} / inhabitant/yr
13.1	Permeability of land	22%	%



2. Contextualisation



Definition:

city scale.

Objectives:

ty issues.

The contextualisation process takes place in 3 steps:

- Selection of criteria 1.
- Benchmarking 2.
- 3. Weighting

SCTool MED



SCTool is a generic multicriteria sustainability assessment.

Users need to adapt it to local conditions.

The result of the contextualisation process is a local version of SCTool, ready to be used for assessing the sustainability at

Develop a contextualised version of SCTool to take in account local priorities, history, climatic conditions, socio-economic conditions, and advancement state in relation to sustainabili-

Definition:

selected.

Objectives:

tables.

2.1 Selection of the active criteria

In the first step of the contextualisation process, users shall select the criteria that will compose the local version of SCTool. Criteria are selected from the whole list of the generic framework. There isn't a fixed number of criteria to be

Only a core set of criteria, the Key Performance Indicators (KPIs) are mandatory for all. They represent the core criteria linked to the transnational global sustainability goals.

The rationale behind the selection could depend on regional policies, targets, specific characteristics of the territory (e.g. touristic area, agricultural area, etc....). The selection of criteria can be documented and justified, using the following

The selection of the active criteria can be documented and justified, using the following tables.

Generic table to report the criteria selection

Name of the issu	Je			
AX	Name of the category	Justification		
AX.X	Name of the criterion	Text		
Example selection	n of active criterias:			
. Use of land and bic	odiversity		G. Social aspects	
A2	Green urban areas	Justification	G3 Availability of public and private facilities and services	Justification
A2.4	Distribution of Green Urban Areas	Green urban Areas is a policy priority	G3.1 Basic service proximity	Support to sustainable mobility policies consistency with the draft revision of the general reg ulation plan (P.R.G.) of the City
Energy			H. Economy	
B2	Energy consumptions	Justification	H1 Economic performance	Justification
B2.1	Final energy consumption	Achievement of the objectives set by the covenant of Mayors	Average annual per-capita incom H1.1 of residents	Support to social and welfare policies
			I. Climate change: mitigation and adaptation	
. Solid waste				
Solid waste D1	Solid waste collection infrastructure	Justification	I1 Greenhouse gas emissions	Justification

Definition:

selected criterion.

Objectives:

order:

4. Statistical data

5. Scientific literature

6. Local reference values

7. Simulations

The selection of benchmarks can be documented and justified, using the following tables.

2.2 Benchmarking

Consists in the definition of the scoring scale for each

The value of benchmarks assigned to the different criteria for score zero (minimum acceptable performance) and for score 5 (excellent and ideal performance). The value of indicators corresponding to score zero is usually depends on regulations, standards or a typical performance in the region. Score 3 represents a best practice performance.

Set the benchmarks for each criteria following the priority

1. National, regional laws 2. National, regional, municipal regulations 3. Technical standards (national or international9

Generic table to report the benchmarks assignment

Name of the issue

Criteria	Indicator	Unit of measurment	Benchmark	Rationale	sources
AX.X	Text	Text	0 (min): number 5 (max): number	Text	Text

Example benchmarking

A. Use of land and biodiversity

Green urban areas	A2.4	Unit of measurment	Benchmark	Rationale
A2	Distribution of Green Urban Areas	%	0 (min): 5 (max):	Technical evaluation of municipal offices

B. Energy

Energy consumptions	B2.1	Unit of measurment	Benchmark	Rationale
B2	Final energy consumption	MWh/inhabitant/ yr	0 (min): 5 (max):	

D. Solid waste

Solid waste co infrastruc		D1.1	Unit of measurment	Benchmark	Rationale
D1	Availabilit collection	y of solid waste	%	0 (min): 75 5 (max): 98	Represents a minimum standard on average in the whole city (city center, peripherical areas,)

G. Social aspects Availability of public and private facilities and services G3.1 L G3 Basic service proximity H. Economy Economic performance H1.1 L H1 Average annual per-capita income of residents Income of residents I. Climate change: mitigation and adaptation

Greenhouse gas emissions	11.1	Unit of measurment	Benchmark	Rationale
11	Total amount of green- house gases (equivalent carbon dioxide units) generated from building operations over a calendar year per inhabitant	kgCO ₂ / 1000m²	0 (min): 22,5 5 (max): 0	Technical evaluation

Unit of easurment	Benchmark	Rationale
%	0 (min): 30 5 (max): 60	

Unit of easurment	Benchmark	Rationale
%	0 (min): 80 5 (max): 90	Based on technical report (Rapporto Rota)

Definition:

text dependent.

calculation.

calculation.

lation.

2.3 Weighting

Consists in setting the weights at criterion, category and issue level through the assignment of priorities.

Priorites are set in relation to local policies and sustainability goals. The priority of criteria, categories and issues are con-

The weighting process takes place in 3 steps:

1. Assignment of priority values to issues and weights

2. Assignment of priority values to categories and weights

3. Assignment of impact factors to criteria and weights calcu-

Weighting of issues

To set the weight s at issue level, it is necessary to define a priority factor for each of them.

The priority factor indicates the relevance of the issue in relation to the context.

A value of 1 means a low priority, a level 5 represents the higher priority.

When all the priority factors have been set, it is possible to calculate the weight of each issue as:

$$W_i = \sum_{i=1}^{\frac{Pi}{N}} Pi \times 100$$

Where: wi = weight of the issue Ai Pi = priority level of the Ai issue

Example:

lssue	Priority factor (1 to 5)	Formula	Weight
A.Use of land and biodiversity	3	W=(3/26)*100	11.6%
B.Energy	3	W=(3/26)*100	11.6%
D.Water	2	W=(2/26)*100	7,6%
D.Solid Waste	2	W=(2/26)*100	7,6%
E. Environmental quality	3	W=(3/26)*100	11.6%
F Transportation and mobility	4	W=(4/26)*100	15.3%
G.Social aspects	3	W=(3/26)*100	11.5%
H.Economy	1	W=(1/26)*100	3.8%
I.Climate change	3	W=(3/26)*100	11.6%
J Governance	2	W=(2/26)*100	7,6%
			100%

Weighting of categories:

When all the priority factors have been set, it is possible to calculate the weight of each category as: $W_{i,j} = \frac{Lj}{\sum_{j=1}^{N_c^{(i)}} Lj} \times 100$ Where: Wi,j= weight of category Cj,k included in issue Ai I i = priority factor of category Cj,k

To set the weight for category level, it is necessary to define a priority factor for each of them. The priority factor indicates the relevance of the issue in relation to the context. A value of 1 means a low priority, a level 5 represents the higher priority.

Example:

Category: Social aspects

Category	Priority factor(PF)	Formula	Weight
G1. Performance of mobility services	3	W=(3/30)*100	10%
G2. Housing	4	W=(4/30)*100	13,3%
G3. Availability of public and private facilities and services	2	W=(2/30)*100	6,6%
G4. Education	4	W=(4/30)*100	13,3%
G5. Social inclusion	4	W=(4/30)*100	13,3%
G6. Safety	5	W=(5/30)*100	16,6%
G7. Health	5	W=(5/30)*100	16,6%
G8. Food and security	3	W=(3/30)*100	10%
			100%

LJ = priority factor	01	C
included in issue		

Weighting of criteria

To weight the criteria is necessary to assign an impact level to each assessment criterion.

The weighting of criteria takes place in 2 steps. Firstly, users assign an impact level (Pk) to each criterion. The impact level is defined as

Step 1: Calculated Pk The impact level is defined as: $P_k = I_k * E_k * D_k * A_k$

Impact of potential effect Impact of the potential effect (lk) It can get from 1 to 3 points depending on the intensity of the 1 Minimum 1 Moderation extent of an effect. The impact is considered very relevant for 2 High all the energy criteria whose effect is very strong on the terri-3 tory, but also economical and air quality criteria may have a big impact in that sense. Extent of potential effect Extent of potential effect (Ek) Block It can get from 1 to 5 points; this factor examines the extent Neighborhood of the effect of the criterion, for example, the road connec-2 3 4 Cluster tivity is an aspect that could strongly affect the larger scale in Urban/Region terms of extent and also the pollutant emissions whose effect 5 Global is perceived on a large scale. Duration of potential effect (Dk) Duration of potential effect It can get from 1 to 5 points; it measures the durability of the effect evaluated by the criterion. Land consumption criteri-1 - 3 years on confirms that an urbanized soil will remain as it is over 3 - 10 Years 2 3 4 5 time, also other aspects related to the urban planning have a 10-30 Years strongly duration impact like for example, green areas provi-30-75 years sion, street connections, pedestrian areas, etc. >75 years A = Adjustment factor in relation to local priorities (1-3) (Ak) It can get from 1 to 3 points; it is a factor that can be used if there is the need to adjust the priority factor of the criterion in relation to specific local priorities. Maybe in a region a particular sustainability issue has a dramatic importance in relation to other issues. In this case the adjustment factor can be used to take in account the local context.

I= Intensity of the potential Effect (1-3) E= Extent of potential effect (1-5) D= Duration of potential effect (1-5) A= Adjustment factor in relation to local priorities (1-3)

Step 2: the weight of each criterion in its category is calculated as:

$$W_{i,j} = \frac{Pk}{\sum_{k=1}^{N_c^{(i,j)}} Pk}$$

 $\omega_{i,i,k}$: weight of the criterion $c_{i,i,k}$ included in the category $C_{i,i}$ P_k = impact level of the criterion $c_{i,i,k}$ included in the category Ci

Example step 1: Impact level as	ssignment				
F1. Performance of mobility se	rvices				
Criterion	lmpact (Pk)	Intensity (lk)	Extent (Ek)	Duration (Dk)	Adjustme (Ak)
F1.1 Public transport net- work	12	2	3	2	1
F1.2 Accessibility of public transportation service	12	2	3	2	1
F1.3 Usage of public trans- portation by population	24	2	3	2	1
Example step 2: Weights assig	nment in the			Weigh	t
		e category F1 Formula 2/48)*100		Weigh 25%	t
Example step 2: Weights assign Criterion F1.1 Public transport net-	(1	Formula			t
Example step 2: Weights assign Criterion F1.1 Public transport net- work F1.2 Accessibility of public	(1 (1	Formula 2/48)*100		25%	t

3.Sustainable Cities Tool



Main elements:

10 lssues 39 Categories 99 Criteria



SCTool MED



Complete list of the criteria which make up the Sustainable MED Cities SCTool are described below. The table also includes for each criterion, the information related to the name of the indicator and the unit of measure.

SCTool criteria list

A	Use of land and biodiversity		
A1	Use of land		
CODE	CRITERION	INDICATOR	UNIT
A1.1	Population density	Population density in built-up areas (city area minus green and blue)	Inhabitants per km ²
A2	Green urban areas		
CODE	CRITERION	INDICATOR	UNIT
A2.1	I I Availability of green urban areas	Total amount of Green Urban Areas in the city's boundaries divided by the total area of the city	%
A2.2	Green areas in relation to the city	Total extension of green areas in the city divided by city's total population	m²/inhabitant
A2.3	Green Area Accessibility	Percentage of inhabitants with ac- cessibility to green areas	%
A2.4	Distribution of Green Urban Areas	Total length of green area bound- aries (edges) divided by the city's urban area	%
A2.5	Green zones and ecosystemic Services	Share of natural green areas on total green areas	%
A3	Biodiversity and ecosystems	1	
CODE	CRITERION	INDICATOR	UNIT
A3.1	Variation of the number of bird species	Share of natural areas that are connected	%
A3.2	 A A A A A A A A A A A A A A A A A A A	This indicator is the number of bird species that is listed in the urban area (natural protected area exclud- ed)	n
A3.3	Connectivity measures for natural areas	Amount of natural connected ar- eas in the city divided by the total amount of natural areas in the city	 %
 18			

В	Energy		
B1	Energy infrastructure		
CODE	CRITERION	INDICATOR	UNIT
B1.1	Access to authorized electrical service	Number of people in the city with authorized electrical service divided by the total population of the city	%
B1.2	Electrical service interruptions	Total sum of hours of interruption multiplied by the number of house- holds impacted divided by the total number of households	hrs/household
B2	Energy consumptions		
CODE	CRITERION	INDICATOR	UNIT
B2.1	Final energy consumption	Total final energy consumed by a city divided by the total population of the city	MWh/inhabitant/yr
B2.2	Residential final thermal energy consumption	Total consumption of final thermal energy divided by the total number of city inhabitants	MWh/inhabitant/yr
=	Public street lighting	Total electricity consumption of pub- lic street lighting divided by the total distance of streets where street- lights are present	 kWh/km yr
B3	Renewable Energy		
CODE	CRITERION	INDICATOR	UNIT
B3.1	Final energy derived from renewable sources	Share of renewable energies in final energy demand	%
B3.2	Renewable energy locally produced	Share of locally produced renewable energies of final energy demand	%

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SCTool MED

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Water

Water infrastructure

CODE	CRITERION	INDICATOR	UNIT
C1.1	Availability of a public municipal water supply	Total number of people with potable water supply service divided by total city population	%
C1.2	Access to wastewater collection	Number of people within the city that are served by wastewater col- lection divided by the city population	%

Water Consumption

CODE	CRITERION	INDICATOR	UNIT
C2.1	Total water consumption	Total amount of the city's daily water consumption divided by the total city population	L/day/person
C2.2	Efficiency in water use	Volume of water supplied minus the volume of utilized water divided by the total volume of water supplied	%
C2.3	Sufficiency of domestic water provi- sion	Volume of the water supplied for domestic uses divided by the overall domestic water demand	%
С3	Effluents management		

CODE CRITERION INDICATOR UNIT Total volume of city wastewater collected for primary, secondary and tertiary treatment in centralized Centralized wastewater treatment % C3.1 wastewater treatment facilities divided by the total volume of wastewater produced in the city Percentage of households with ac-Household sanitation C3.2 cess to basic sanitation facilities % Solid Waste

Solid waste collection infrastructure

CODE	CRITERION	INDICATOR	UNIT
D1.1	Availability of solid waste collection	Percentage of population with regu- lar solid waste collection	%
50			SCTool MED

Solid waste management D2 CODE CRITERION Total a Solid waste generation D2.1 ated div lation Total a Solid waste recycling recycle D2.2 of solic Environmental quality

EI	Air quality		
CODE	CRITERION	INDICATOR	UNIT
E1.1		Annual average fine particulate mat- ter (PM2.5) concentration	µg/m³
E1.2		Annual average fine particulate mat- ter (PM10) concentration	µg/m³
E1.3	Nitrogen Dioxide concentration (NO2)	Sum of daily concentrations for the whole year divided by 365 days	μg/m ³
E1.4	Sulfur Dioxide concentration (SO2)	Sum of daily concentrations for the whole year divided by 365 days	μg/m ³
E1.5	Ozone concentration (O3)	Sum of daily concentrations for the whole year divided by 365 days	µg/m³
E2	Noise		
CODE	CRITERION	INDICATOR	UNIT
E2.1	Noise pollution	Population exposed to noise pollu- tion divided by the total population of the city	%

INDICATOR	UNIT
amount of solid waste gener- livided by the total city popu-	tonnes/inhabitant/yr
amount of solid waste that is ed divided by the total amount id waste produced in the city	%

F0			
E3	EMF exposure		
CODE	CRITERION	INDICATOR	UNIT
E3.1	Exposure to high frequency electro- magnetic fields	Percentage of mobile network an- tenna sites in compliance with EMF exposure guidelines	%
E3.2	Percentage of buildings exposed to ELF magnetic fields	Percentage of buildings in the area located not respecting the safety distance from high voltage lines	%
F	Transportation and mobility	1	•
F1	Performance of mobility services	S	
CODE	CRITERION	INDICATOR	UNIT
F1.1	Public transport network	Length of public transport system per 1000 population	km/1000 inhabitants
F1.2	Accessibility of public transportation service	Percentage of inhabitants that are within 500 meters walking distance of at public transportation service stop running at least every 20 min- utes during peak periods	%
F1.3	Usage of public transportation by population	Total annual number of public transport trips originating in the city divided by the total city population	trips/inhabitant
F2	Green mobility		
CODE	CRITERION	INDICATOR	UNIT
F2.1	Shared vehicles	Number of shared vehicles per 1.000 inhabitants	n/1.000 inhabitants
F2.2	Electric-vehicle infrastructure (charging stations)	Electric vehicle charging stations per inhabitant	n/inhabitant
F2.3	Low-Carbon Emission Passenger Vehicles	Percentage of low-carbon emission passenger vehicles	% %
F2.4	Bicycle network	Total length of bicycle paths and lanes divided by the city's total pop- ulation	m/inhabitant

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Total number of low emission public vehicles divided by total number of public vehicle

| _ _ _ _ _ _ _ _ _ _ _ _ _ _ _

Number of shared bicycles per 1.000 n/1.000 inhabitants

F3	Safety in mobility		
CODE	CRITERION	INDICATOR	UNIT
F3.1	Pedestrian infrastructure	 Total area of pedestrian streets and walkways divided by the total area of streets and roads in the city 	%
F3.2	Availability of sidewalks	Percentage of roads' length that has dedicated sidewalks	%
F3.3	Safety of bicycle lines	Percentage of bicycle paths physical- ly separated from traffic roads	%
F3.4	Traffic fatalities	Traffic fatalities per 1.000 inhabi- tants	n/1.000 inhabitants
F3.5	Private transportation services	Number of taxi licenses divided by 1000th of the city's population	n/1.000 inhabitants
G	Social Aspects	·	
G1	Performance of mobility service	25	
CODE	CRITERION	INDICATOR	UNIT
G1.1	Accessibility of public buildings	Total number of public buildings accessible by disabled persons di- vided by the total number of public buildings	%
G1.2	Barrier-free accessibility in local outdoor public areas	Percentage of accessible public outdoor areas that are barrier-free compared to the total public area	%
G1.3	Accessibility of public transport network	Percentage of public transport vehicles that are accessible disabled persons	%
G2	Housing		
CODE	CRITERION	INDICATOR	UNIT
G2.1	 Affordability of housing property 	Housing properties in the city that are financially accessible to the low- est quintile of area population	%
G2.2	Affordability of housing rental	Percentage of the average salary of the lowest quintile of the population used for rental payments	%
G2.3	Vacant residential units	Percentage of vacant residential units	%
G2.4	I I Informal settlements	Area of informal settlements within the city boundary divided by the city area	%
SCTool ME			53

F3

%

52

F2.5

F2.6

1

Shared bicycles

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Green public vehicles

INDICATOR	UNIT
area of pedestrian streets and vays divided by the total area eets and roads in the city	%
ntage of roads' length that has ated sidewalks	%
ntage of bicycle paths physical- arated from traffic roads	%
c fatalities per 1.000 inhabi-	n/1.000 inhabitants
per of taxi licenses divided by h of the city's population	n/1.000 inhabitants

INDICATOR	UNIT
number of public buildings sible by disabled persons di- by the total number of public ngs	%
ntage of accessible public or areas that are barrier-free ared to the total public area	, %
ntage of public transport es that are accessible disabled ns	%

INDICATOR	UNIT
ng properties in the city that nancially accessible to the low- intile of area population	%
ntage of the average salary of west quintile of the population for rental payments	
ntage of vacant residential	 %
of informal settlements within y boundary divided by the city	" I I % I

i3	Availability of public and private	facilities and services	
CODE	CRITERION	INDICATOR	UNIT
G3.1	Basic service proximity	Number of inhabitants who live near at least one basic service divided by the total population of the city	%
G3.2	Open space for public use	Average share of the built-up area of the city that is open space for public use	%
G3.3	Accessibility of shores/beaches	Total area of shores/beaches in the city area that are accessible by inhabitants divided by the total area of shores/beaches in the city's urban area	%
4	Education		
CODE	CRITERION	INDICATOR	UNIT
G4.1	Primary enrollment rate	Net primary enrollment rate	%
G4.2	Female school-aged population en- rolled in schools	Number of city's female school- aged population enrolled at primary and secondary levels in public and private schools divided by the total number of a city's female school- aged population	%
G4.3	Secondary school enrollment	Lower secondary completion rate	
G4.4	Tertiary education	Population age 25-34 with tertiary educational attainment	~
5	Social inclusion		
ODE	CRITERION	INDICATOR	UNIT
G5.1	Gender pay gap	Difference between average gross hourly earnings of male and female paid employees as a percentage of average gross hourly earnings of male paid employees	%
G5.2	Energy poverty of households	Percentage of households unable to afford the most basic levels of en- ergy (more than 10% of the income spent on energy bills)	%
G5.3	Population living below poverty line	Number of people living below the national poverty line set at country level divided by the total current population of the city	%
 54			SCTool ME

G5.4	Inequality	Gini co
G5.5	Voter participation	Percen that vo election
G6	Safety	
CODE	CRITERION	
G6.1	Police service	l Numbe i inhabita
G6.1	Fire service	Numbe inhabit
G6.1	Population living in disaster prone areas	Percen zone su
G7	Health	
CODE	CRITERION	
G7.1	Life expectancy	Average new-bo current apply
G7.2	Physicians	Numbe inhabita
G7.3	In-Patient Hospital Beds	Numbe beds pe
G8	Food security	
CODE	CRITERION	
G8.1	Local production of food	Percent from w area
G8.2	Urban agricultural land	Total u for foo city bou th of th

SCTool MED

oefficient of inequality	n
ntage of the eligible population oted during the last municipal on	%
INDICATOR	UNIT
er of police officers per 1.000 itants	n/1.000 inhabitants
per of firefighters per 1.000 itants	n/1.000 inhabitants
ntage of inhabitants living in a subject to natural hazards	%
INDICATOR	UNIT
ge number of years that a orn is expected to live if nt mortality rates continue to	years
per of physicians per 1.000 itants	n/1000 inhabitant
per of in-patient public hospital per 1,000 inhabitants	n/1000 inhabitant
INDICATOR	UNIT
ntage of local food supplied within 100 km of the urban	%
urban agricultural area used od production located within oundaries divided by one 1000 the city's total population	he/1000 inhabitants

	Economy		
11	Economic performance		
CODE	CRITERION	INDICATOR	UNIT
H1.1	Average annual per-capita income of residents	Average per-capita income of res- idents in the local area relative to that of the urban region as a whole	%
H1.2	Economic contribution from tourism activity	Sum of overnight visitor stays divid- ed by the area's total population	stays/resident
12	Employment		
CODE	CRITERION	INDICATOR	UNIT
H2.1	Unemployment rate	Total number of working-age prima- ry residents not in paid employment or self-employment, but available for work and seeking work divided by the total labour force	%
H2.2	Youth unemployment rate	Total number of a city's unemployed youth divided by the city's youth labour force	%
H2.3	Female employment	Total number of working age wom- en in employment divided by the total female labour force	%
13	Innovation		
CODE	CRITERION	INDICATOR	UNIT
H3.1	New business registration rate	Proportion of business registrations per 10.000 inhabitants aged 16 and above	n
14	ICT infrastructure		
CODE	CRITERION	INDICATOR	UNIT
H4.1	Fixed Broadband Subscriptions	Percentage of households with fixed (wired) broadbandvv	%
H4.2	Wireless Broadband Coverage	Percentage of the city served by wireless broadband (3G, 4G, 5G)	%
H4.3	Availability of WIFI in Public Areas	Number of public WIFI hotspots in the city per 1000 inhabitants	n/1.000 inhabitant
H4.4	Mobile phone subscriptions	Total number of mobile phone sub- scriptions in the area divided by one 1000th of the area's total population	n/1.000 inhabitan

Climate Change: mitigation and adaptation

11	Climate change mitigation	
CODE	CRITERION	
11.1	Greenhouse gas emissions	Total a (equiv genera all sec city po
11.2	CO2 sequestration	Potent neighb
12	Adaptation to the climatic action	: heatw
CODE	CRITERION	
12.1	Albedo	Mean paved neight
13	Adaptation to the climatic action	: pluvia
CODE	CRITERION	
13.3	Permeability of land	Percer perme
4	Adaptation to the climatic action	: fluvia
CODE	CRITERION	
14.1	Flood risk	Percer to floc
15	Adaptation to the climatic action	: drou
CODE	CRITERION	
15.1	Rainwater collection and storage from buildings for non-potable uses	Share hood v systen
15.2	Local vegetation	Share plated
16	Adaptation to the climatic hazard	d: wildf
CODE	CRITERION	
I6.1	Wildfire risk	Percer to wild

INDICATOR	UNIT
amount of greenhouse gases valent carbon dioxide units) rated over a calendar year for ctors, divided by the current opulation	t CO _{2 eq} / inhabitant/yr
tial CO2 sequestraion in the porhood per hectare	kg CO _{2 eq} / m ²
waves and increase of tem	perature
INDICATOR	UNIT
Solar Reflectance Index of I surfaces and roofs in the borhood	I SRI
al flood	
INDICATOR	UNIT
ntage of weighted ground eability	%
al and coastal flood	
INDICATOR	UNIT
ntage of population exposed od risk	%
ght	
INDICATOR	UNIT
of buildings in the neighbor- with a rainwater collection m	%
of landscape (green areas) l with local vegetation	%
fire	
INDICATOR	UNIT
ntage of population exposed dfire risk	%
	57

1	Governance		
14			
J1	Urban Planning		
CODE	CRITERION	INDICATOR	UNIT
J1.1	Community involvement in urban planning activities	Percentage of residents active in public urban planning	Level
J2	Management and community in	volvement	
CODE	CRITERION	INDICATOR	UNIT
J2.1	Involvement of residents in commu- nity affairs	Percentage of resident population above 16 years having an involve- ment in community affairs	%
J3	Public buildings operation		
CODE	CRITERION	INDICATOR	UNIT
J3.1	Public buildings sustainability	Percentage area of public buildings with recognized sustainability certifi- cations for ongoing operations	% I
J3.2	Operating energy costs for public buildings	Aggregated annual operating energy cost per aggregated indoor useful floor area	€/m²/yr
J3.3	Energy consumption of public build- ings	Total end use of energy in public buildings within a city divided by total indoor useful area of these buildings	kWh/m²
J4	Equity		
CODE	CRITERION	INDICATOR	UNIT
J4.1	Women elected to city level office	Total number of elected city-level positions held by women divided by the total number of elected city-level positions	%

A.Use of Land & Biodiversity

Description of the Information

A: Issue.

Ax: Category.

- A1: Urban Structure and Form.
- A2: Green Urban Areas.

A3: Biodiversity and Ecosystems. Ax.x: Criterion.

Intent: Description of the objective of the criterion.

Indicator: Name of the indicator to be calculated.

Unit of Measure: Measuring unit of each indicator.

Standard: The calculation standard for the criterion.

References: The acquiring source of information.

★ Key Performance Indicator

A. Use of L Biodiv		SCTool
A2 Green urban	areas	
★ A2.1 Availability of	f Green Urban Area	as
Intent: To facilitate climo mitigation, to improve heat biodiversity		
Indicator	Unit of Measure	e
Proportion of all vegetated areas within the city boundaries in relation to the total area	%	
Assessment Methodolog	y:	
 the city's boundaries (A) - 1 2. Calculate the total are (B) - de 3. Calculate the value or 	enominator	in
	rea is defined as an urba ion of any kind, for instar blic and private garden.	
Standard: –	Reference: IEFCA – Calculation G	uideline

00	A. Use of L	and and	
₩	Biodiv	ersity	SCTool
A1	Use of land		
A1.1	Population De	ensity	
		increase of the proximit local goods and service	
h	ndicator	Unit of Measure	9
	ulation in relation city's land area.	Inhabitants / km²	
	nent Methodolog	/ population	
2. Ca	Ilculate the total lar	numerator nd area of the city enominator	
3. Ca	Iculate the value of	the indicator as A/B	
	esult shall be expre quare kilometre.	ssed as number of perso	ns
Standar	d: F	Reference:	
	- c	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life	
000	- s A. Use of L	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life and and	
20 A2 A2.2	A. Use of L Biodiv Green urban Green areas ir	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life and and ersity	r city
A2 A2.2 Intent: Tregulate	A. Use of L Biodive Green urban Green areas ir population To improve the air quality and clin and protecting lak	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life and and ersity areas relation to the city	sctool
A2 A2.2 Intent: Tregulate supplies	A. Use of L Biodive Green urban Green areas ir population To improve the air quality and clin and protecting lak	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life and and ersity areas relation to the city urban environment he nate, recharging ground es and streams from po	sctool sctool elping water Iluted
A2 A2.2 Intent: Tregulate supplies	A. Use of L Biodive Green urban Green areas in population To improve the air quality and clin and protecting lak ru	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life and and ersity areas relation to the city urban environment he nate, recharging ground es and streams from po noff.	sctool sctool elping water Iluted
A2 A2.2 A2.2 Intent: Tregulate supplies	A. Use of L Biodive Green urban Green areas in population To improve the air quality and clin and protecting lak ru ndicator tension of green the city divided by	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life and and ersity areas relation to the city urban environment he nate, recharging ground es and streams from po noff. Unit of Measure m ² /inhabitant	sctool sctool elping water Iluted
A2 A2.2 A2.2 Intent: Tregulate supplies	A. Use of L Biodive Green urban Green areas in population To improve the air quality and clin and protecting lak ru ndicator tension of green the city divided by otal population the city divided by otal population	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life and and ersity areas relation to the city urban environment he nate, recharging ground es and streams from po noff. Unit of Measure m ² /inhabitant	sctool sctool elping water Iluted
A2 A2.2 A2.2 Intent: Tregulate supplies Intent: Tregulate Intent:	A. Use of L Biodive Green urban Green areas in population To improve the air quality and clin and protecting lak ru ndicator tension of green the city divided by otal population nent Methodolog alculate the total arr ity's boundaries. (A) - r	SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life and and ersity areas relation to the city urban environment he nate, recharging ground es and streams from po noff. Unit of Measure m ² /inhabitant y: nount of vegetated areas	sctool sctool elping water Iluted

Standard:

20	A. Use of I		SCTool
	Biodiv	-	
	Green urban Green Area <i>A</i>		
A2.3	Sreen Area A		
	and to reduce	her quality of life for the negative effects of urbo tion	
Inc	licator	Unit of Measure	e
with access	of inhabitants ibility to green ireas	%	
Assessme	nt Methodolog	ıy:	
		r of inhabitants living with ssible green space of at le	
0.0114	(A) - I	numerator	
2. Calco	ulate the city's to (B) - de	tal population enominator	
3. Calc		f the indicator as //B (%)	
Standard: -	L P	Reference: INECE - Collection Methodolog erformance Indicators for Sma justainable Cities.	
	A. Use of I Biodiv		SCTool
A2 0	Green urban	areas	
A2.5	Green zones	and ecosystemic se	rvices
bility (capt	uring pollutants	efits from green zones a s, reducing the " heat is creational spaces, etc.)	
Inc	licator	Unit of Measure	e
	natural green tal green areas	%	
Assessme	nt Meth <mark>odolo</mark> g	ly:	
	s) in the city	t of natural green areas (i numerator	in
2. Calco	ulate the total an	een area of the city	
		enominator	

Reference:

SCTool MED

Reference:

IEFCA – Calculation Guideline

Standard:

00 C0	A. Use of L Biodiv		SCTool	
A2	Green urban	areas		
A2.4 Distribution of Green Urban Areas				
Intent: Evaluate the distribution of green urban area to promote the equal distribution				
Ir	ndicator	Unit of Measure	י ו ו פ	
boundarie	th of green area (edges) divided ty's urban area	%		
Assessm	ent Methodolog	y:		
1. Calcu		th of green area boundar umerator	ries I I	
2. Calcu	ulate the total area (B) - der	of the city nominator		
3. Calcu	ulate the value of th A/I	ne indicator as B (%)		
Standard: Reference: - 1.CESBA MED Project 2 SNTcol Assessment System.				
00 C0	A. Use of L Biodiv		SCTool	
80 A3	Biodiv		SCTool	
80 A3 A3.1	Biodiversity a	ersity		
	Biodiversity a Variation of th	ersity nd ecosystems	ecies	
Inte	Biodiversity and Variation of the other serve bio of the other serve	ersity nd ecosystems e number of bird spe	ecies	
Inte Ir Percentag	Biodiversity a Variation of the	ersity nd ecosystems e number of bird spe odiversity of bird species	ecies	
Inte In Percentag number	Biodiversity a Diversity a Variation of the ont: To preserve bio dicator ge change in the	ersity nd ecosystems e number of bird species odiversity of bird species Unit of Measure %	ecies	
Inte Ir Percentag number Assessm	Biodiversity and Variation of the ent: To preserve biogen adicator ge change in the of bird species ent Methodology loulate the total net	ersity nd ecosystems e number of bird species odiversity of bird species Unit of Measure %	ecies	
Inte Irr Percentag number Assessm 1. Cal 2. Cal	Biodiversity and Variation of the ent: To preserve biogen adicator ge change in the of bird species ent Methodolog loculate the total ner (A) - r	ersity nd ecosystems e number of bird species odiversity of bird species Unit of Measure % y: t change in species numerator mber of species from mo	ecies	
Inte Ir Percentag number Assessm 1. Cal 2. Cal recent	Biodiver Biodiversity a Variation of the ent: To preserve bio adicator ge change in the of bird species ent Methodolog loulate the total ne (A) - r loulate the total nu t survey (B) - de	ersity nd ecosystems e number of bird species odiversity of bird species Unit of Measure % y: t change in species numerator mber of species from mo enominator	ecies	

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A. Use of Biodiv	Land and versity	SCTool		A. Use of Lo Biodive		SCT
A3 Biodiversity and ecosystemsA3.2 Native biodiversity in built up area		1	A3 Biodiversity and ecosystems A3.3 Connectivity measures for natural area			
		a				
Intent: To protect native s	pecies to maintain biodiver	rsity	I Intent: To ma	ximise the conn are	ectivity measures for eas	natur
Indicator	Unit of Measure	l I	Indic	ator	Unit of Measu	re
This indicator is the number of bird species that is listed in the urban area (natural protected area excluded)	n		Amount of connected are divided by amount of nat	eas in the city the total tural areas in	%	
ssessment Methodolo	gy:		I I 1. Calcula	Methodology ate the amount of es) in the city	: of natural connected a	ireas
	of bird species that is listed i I protected area excluded)	in 	1 1 2. Calculo 1 city 1	(A) - nu ite the total amo (B) - der ite the value of t	umerator pount of natural area in nominator the indicator as 3 (%)	n the
				pe connected, G 100 meters apa	reen Urban Areas sha rt.	ıll be
tandard: R	eference:		Standard:		Reference:	
C	SO 37120: Sustainable cities and ommunities - Indicators for city se nd quality of life		-		Reference Framewor Sustainable Cities - I	



B: Issue.

- Bx: Category.
 - B1: Energy infrastructure.
 - **B2: Energy consumptions**
 - B3: Renewable energy
- Bx.x: Criterion.
- **Intent:** Description of the objective of the criterion.

Indicator: Name of the indicator to be calculated.

Unit of Measure: Measuring unit of each indicator.

Standard: The calculation standard for the criterion.

References: The acquiring source of information.

★ Key Performance Indicator

	Energy	SCTool
B1 Energy	infrastructure	
B1.2 Electric	al service interrup	tions
	l benchmark reliability p services and resource c	
Indicator	Unit of <i>N</i>	Neasure
Total sum of hour interruption multipl the number of hous impacted divided k total number of ho holds	ied by hours/hours/hours/hours/hou by the	usehold
Assessment Meth	odology:	
	e total sum of hours of in e number of households (A) - numerator	
Standard: –	Reference: ISO 37120: Susto communities - Inc	ainable cities and

	Ene	ergy	SCTool
B1 Energy	infras	tructure	
B1.1 Access t	to autl	norized electrical se	ervice
	inability	cal service as a contril v, resilience and eco luctivity	
Indicator		Unit of Measur	е
Number of people i city with authoriz electrical service divi the total population city	ed ded by	%	
Assessment Metho	odolog	y:	
 Calculate the authorized electr 	rical serv	of people in the city with vice in residential buildin numerator	h gs
2. Calculate the		pulation of the city enominator	
3. Calculate the		f the indicator as /B (%)	
Standard:		Reference:	
		services and quality of life	
(4)	Ene	ergy	SCTool
B2 Energy			SCTool
Line gy	consu	ergy mptions horized electrical se	
B2. 1 Access	consu to autl the find	mptions	ervice
B2. 1 Access	consu to autl the find	mptions horized electrical se al energy consumption	e rvice for all
B2. 1 Access f	consu to auti the find energ	mptions horized electrical se al energy consumption y sectors	for all
B2. 1 Access to Intent: To estimate Indicator Total final energy co med by a city divide the total population	consu the find energ	mptions horized electrical se al energy consumption y sectors Unit of Measure MWh/inhabitant/yr	for all
B2. 1 Access f Intent: To estimate Indicator Total final energy co med by a city divide the total population city Assessment Metho	consu- the find energ	mptions horized electrical se al energy consumption y sectors Unit of Measure MWh/inhabitant/yr	for all
B2. 1 Access f Intent: To estimate Indicator Total final energy co med by a city divide the total population city Assessment Metho 1. Calculate the energy sectors in	the find energ onsu- ed by of the final en MWh (A) - r total po	mptions horized electrical se al energy consumption y sectors Unit of Measure MWh/inhabitant/yr y: ergy consumption for all	for all
B2. 1 Access f Intent: To estimate Indicator Total final energy co med by a city divide the total population city Assessment Metho 1. Calculate the energy sectors in 2. Calculate the	the find energ onsu- ed by of the final en MWh (A) - r total po (B) - de	mptions horized electrical se al energy consumption y sectors Unit of Measure MWh/inhabitant/yr y: ergy consumption for all numerator pulation of the city	for all
B2. 1 Access f Intent: To estimate Indicator Total final energy co med by a city divide the total population city Assessment Metho 1. Calculate the energy sectors in 2. Calculate the	the find energ onsu- ed by of the odolog final en MWh (A) - r total po (B) - de value of	mptions horized electrical se al energy consumption y sectors Unit of Measure MWh/inhabitant/yr y: ergy consumption for all numerator pulation of the city enominator f the indicator as	for all e

Ch			
	Ene	rgy	SCTool
B2 B2.2	Energy consu Residential final consumption	mptions thermal energy	
Intent: To		rmal energy consumption operations	on for
h	ndicator	Unit of Measure	ו פ ו ו
thermal e the tota	sumption of final energy divided by I number of city habitants	MWh/inhabitant/yr	
Assessm	ent Methodolog	y:	
	uilding operations i	ermal energy consumptio n MWh numerator	n
2. Ca	lculate the total po (B) - de	pulation of the city enominator	
3. Ca	lculate the value of	the indicator as A/B	
Standard	1	Reference:	
	13790 - Energy Ince of buildings	CESBA MED Project - assessment system	- SNTool
Ì	Ene	rgy	SCTool
B 3 ★ B3.1	Re newable e		
★ B3.1	Re newable en Final energy d sources	nergy	ble
★ B3.1 Intent: To	Re newable en Final energy d sources	nergy erived from renewal	ble ion of
★ B3.1 Intent: To In Share energie	Re newable en Final energy d sources	nergy erived from renewal nsumption and producti ble energy	ble ion of
★ B3.1	Re newable en Final energy d sources o incentive the con renewal ndicator of renewable s in final energy	nergy erived from renewal nsumption and production ble energy Unit of Measure %	ble ion of
★ B3.1 Intent: To In Share energie Assessm 1. Ca energ	Re newable en Final energy d sources to incentive the con- renewal andicator of renewable s in final energy demand ment Methodolog alculate the total con- gy generated from r gy sectors MWh	nergy erived from renewal nsumption and production ble energy Unit of Measure %	ble ion of
★ B3.1 Intent: To In Share energie Assessm 1. Ca energie	Re newable en Final energy d sources	nergy erived from renewal nsumption and production ble energy Unit of Measure % y: nsumption of end-use renewable sources for all	ble ion of
★ B3.1 Intent: To In Share energie Assessm 1. Ca energ energ 2. Ca	Re newable en Final energy d sources o incentive the con- renewal adicator of renewable s in final energy demand nent Methodolog alculate the total con- gy generated from r gy sectors MWh (A) - r alculate the total fin (B) - de	nergy erived from renewal nsumption and production ble energy Unit of Measure % y: nsumption of end-use renewable sources for all numerator al energy demand MWh enominator	ble ion of
★ B3.1 Intent: To In Share energie Assessm 1. Ca energ energ 2. Ca	Re newable en Final energy d sources to incentive the con- renewal andicator of renewable s in final energy demand nent Methodolog alculate the total con- gy generated from r gy sectors MWh (A) - r alculate the total fin (B) - de alculate the value of A	nergy erived from renewal nsumption and production ble energy Unit of Measure % y: nsumption of end-use renewable sources for all numerator al energy demand MWh enominator if the indicator as /B (%) Reference:	ble ion of
★ B3.1 Intent: To In Share energie Assessm 1. Ca energie 2. Ca 3. Ca	Re newable en Final energy d sources to incentive the con- renewal andicator of renewable s in final energy demand ment Methodolog alculate the total con- gy generated from r gy sectors MWh (A) - r alculate the total fin (B) - de alculate the value of A	nergy erived from renewal nsumption and production ble energy Unit of Measure % y: nsumption of end-use renewable sources for all numerator al energy demand MWh enominator if the indicator as /B (%)	ble ion of

SCTool MED

services and quality of life

$\langle \mathbf{f} \rangle$	Ene	ergy	SCTool	
B2 Ener	rgy consu	mptions		
B2. 3 Public street lighting				
Intent: To improve the efficiency of street lighting for cost-effective steps and energy efficiency				
Indica	tor	Unit of Measure	e 1	
Total electricity tion of publi lighting divide total distance where streetli preser	c street ed by the of streets ghts are	kWh/km yr		
Assessment M	ethodolog	y:		
	lighting kW	ectricity consumption of h numerator		
2. Calculate are present	in the city	of streets where streetligh enominator	nts I	
3. Calculate		f the indicator as A/B		
Standard:	I	Reference: SO 37120: Sustainable cit	ies and	
-	c	communities - Indicators fo		
services and quality of life				
$\langle \!$	Ene	ergy	SCTool	
B3 Ren	Ene ewable e		SCTool	
	ewable e			
B3. 2 Ren	ewable e ewable er	nergy	ced	
B3. 2 Ren	ewable e ewable er ntive the pro	nergy nergy locally produ	ced nergy	
B3. 2 Ren	ewable en ewable en ntive the pro tor produced ergies of	nergy nergy locally produ aduction of renewable e	ced nergy	
B3. 2 Ren Intent: To incer Indica Share of locally renewable en final energy of	ewable en ewable en ntive the pro tor produced ergies of demand	nergy nergy locally produ aduction of renewable en Unit of Measure %	ced nergy	
B3. 2 Ren Intent: To incer Indica Share of locally renewable en final energy of Assessment M 1. Calculate	ewable en ewable en ntive the pro tor produced ergies of demand ethodolog the total loc rom renewak	nergy nergy locally produ aduction of renewable en Unit of Measure %	ced nergy	
B3. 2 Ren Intent: To incer Indica Share of locally renewable en final energy of Assessment M 1. Calculate generated fr	ewable er ewable er ntive the pro tor produced ergies of demand ethodolog the total loc rom renewak (A) - r	nergy nergy locally production of renewable en Unit of Measure % y: cally production of energy ble sources MWh	ced nergy	
B3. 2 Ren Intent: To incen Indica Share of locally renewable en final energy of Assessment M 1. Calculate generated fr 2. Calculate	ewable er ewable er ntive the pro tor produced ergies of demand ethodolog the total loc rom renewak (A) - r the total fin (B) - de	nergy nergy locally produ- eduction of renewable en Unit of Measure % y: cally production of energy ble sources MWh numerator al energy demand MWh	ced nergy	
B3. 2 Ren Intent: To incen Indica Share of locally renewable en final energy of Assessment M 1. Calculate generated fr 2. Calculate	ewable er ewable er ntive the pro tor produced ergies of demand ethodolog the total loc rom renewak (A) - r the total fin (B) - de	nergy nergy locally produ- eduction of renewable en Unit of Measure % y: cally production of energy ble sources MWh numerator al energy demand MWh enominator f the indicator as	ced nergy	
B3. 2 Ren Intent: To incen Indica Share of locally renewable en final energy of Assessment M 1. Calculate generated find 2. Calculate 3. Calculate	ewable er ewable er ntive the pro tor produced ergies of demand ethodolog the total loc rom renewak (A) - r the total fin (B) - de	nergy nergy locally production of renewable enduction of renewable enduction of Measure % y: cally production of energy ble sources MWh numerator al energy demand MWh enominator f the indicator as /B (%)	ced nergy	



C: Issue.

Cx: Category.

C1: Water infrastructure.

C2: Water consumption.

C3: Effluents management.

Cx.x: Criterion.

Intent: Description of the objective of the criterion.

Indicator: Name of the indicator to be calculated.

Unit of Measure: Measuring unit of each indicator.

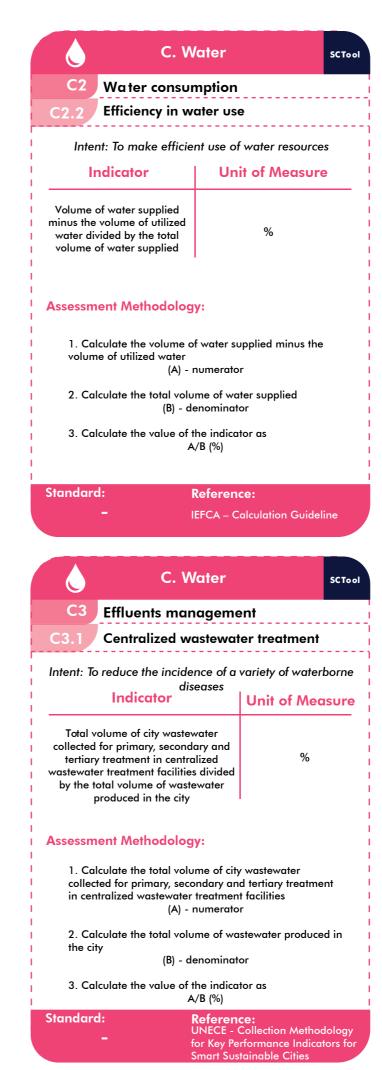
Standard: The calculation standard for the criterion.

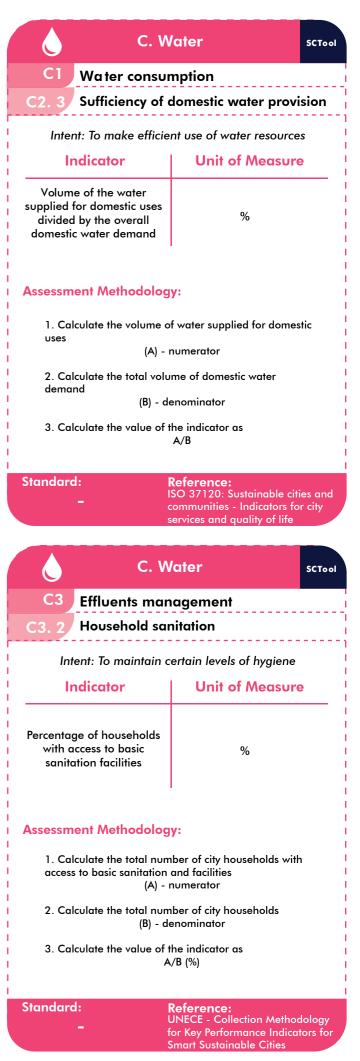
References: The acquiring source of information.

★ Key Performance Indicator

<u> </u>	Water	SCTool		
C1 Water infrastructure				
C1. 2 Access to wastewater collection				
Intent: To evaluate city health, cleanliness and quality of life				
Indicator	Unit of Measure	e		
Number of people within th city that are served by wastewater collection divid by the city population	%			
are served by wastewa		0		
(A) - numerator 2. Calculate the total city population (B) - denominator				
3. Calculate the value of the indicator as A/B (%)				
	A/ D (%)			

C. V	Vater sct	
C1 Wa ter infras Availability of a supply	tructure 1 public municipal water	
Intent: To evaluate city	y health and quality of life	
Indicator	Unit of Measure	
Total number of people with potable water supply service divided by total city population	%	
Assessment Methodolog	ду:	
 Calculate the total number of people with potable water supply service (A) - numerator Calculate the total city population (B) - denominator Calculate the value of the indicator as A/B (%) 		
 Calculate the value of the indicator as A/B (%) Note: The total number of people with potable water supply service shall be calculated as the total number of households in the city connected to a potable water supply service multiplied by the current average household size for the city. A house shall not be considered to have access to potable water when an individual house or group is served by a conduit system built with, for example, wood, bamboo, or rubber hose, connected directly to a river, well or another house. 		
-	Reference: ISO 37120: Sustainable cities a communities - Indicators for city services and quality of life	
C. V	Vater sct	
C2 Water consu	mption	
	mption	
C2 Water consu C2.1 Total water co	mption	
C2 Water consu C2.1 Total water co	mption Insumption	
C2 Water consu C2.1 Total water co Intent: To evaluate w	mption onsumption rater resources in the city	
C2 Water consu C2.1 Total water co Intent: To evaluate w Indicator Total amount of the city's daily water consumption divided by the total city	mption onsumption rater resources in the city Unit of Measure L/day/person	
C2 Water consu C2.1 Total water co Intent: To evaluate w Indicator Total amount of the city's daily water consumption divided by the total city population Assessment Methodolog	mption onsumption rater resources in the city Unit of Measure L/day/person	
C2 Wa ter consu C2.1 Total water co Intent: To evaluate w Indicator Total amount of the city's daily water consumption divided by the total city population Assessment Methodolog 1. Calculate the total am consumption in litres per (A) - 2. Calculate the total city	mption nsumption rater resources in the city Unit of Measure L/day/person ay: ount of the city's water day numerator	
C2 Wa ter consu C2.1 Total water co Intent: To evaluate w Indicator Total amount of the city's daily water consumption divided by the total city population Assessment Methodolog 1. Calculate the total am consumption in litres per (A) - 2. Calculate the total city	mption nsumption rater resources in the city Unit of Measure L/day/person ay: ount of the city's water day numerator population lenominator	
C2 Water consu Total water co Intent: To evaluate w Indicator Total amount of the city's daily water consumption divided by the total city population Assessment Methodolog 1. Calculate the total am consumption in litres per (A) - 2. Calculate the total city (B) - c 3. Calculate the value of Standard:	mption msumption rater resources in the city Unit of Measure L/day/person ay: ount of the city's water day numerator population lenominator the indicator as	







D: Issue.

Dx: Category.

D1: Solid waste collection infrastructure

D2: Solid waste management.

Dx.x: Criterion.

Intent: Description of the objective of the criterion.

Indicator: Name of the indicator to be calculated.

Unit of Measure: Measuring unit of each indicator.

Standard: The calculation standard for the criterion.

References: The acquiring source of information.

★ Key Performance Indicator

D. Solid	waste	SCTool
D2 Solid waste management		
D2.1 Solid waste generation		
Intent: To assess the pro	duction of waste in the o	city
Indicator	Unit of Measure	9
Total amount of solid waste generated divided by the total city population	tonnes/inhabitant/yı	
Assessment Methodolog	y:	
Calculate total amount of solid waste (household and commercial) generated in tonnes per year (A) - numerator Calculate the total city population (B) - denominator Calculate the value of the indicator as A/B		
Note: Municipal waste shall include nouseholds; e.g. schools, hospitals, governmer Aunicipal waste also includes: bulky waste (e.g. white goods, old eaves, grass clippings, street swee and market cleansing waste, if man vaste from selected municipal serv maintenance, waste from street cle he content of litter containers, man vaste. Not to include in the calculation: vaste from municipal sewage netwo municipal construction and demoli	sses, office buildings and institut buildings). furniture, mattresses); garden pings, the content of litter cont naged as waste; rices, i.e. waste from park and aning services (e.g. street swer rket cleansing waste), if manage vork and treatment;	waste, tainers, garden epings,
- 1	Reference: SO 37120: Sustainable citi communities - Indicators fo services and quality of life	

D. Solic	l waste	SCTool		
D1 Solid waste collection infrastructure				
D1.1 Availability of solid waste collection				
Intent: To evaluate city health, cleanliness and quality of				
Indicator	life Unit of Measure	e		
Percentage of population with regular solid waste collection	%			
Assessment Methodolog	y:			
 Calculate the number of city households that are served by solid waste collection (A) - numerator Calculate the total number of city households (B) - denominator Calculate the value of the indicator as A/B (%) Note: Regular solid waste collection shall be defined as having the solid waste picked up from collection points, transported and dropped at a proper treatment facility (recycling or landfill sites) on at least a weekly basis or every two weeks. If the solid waste is collected in any moving vehicle by persons who have not constituted a legally established entity, the house shall not be considered as a household serviced with a solid waste collection service. 				
Standard: - - - - - - - - - - - - -				
	Smart Sustainable Cities			
D. Solic		SCTool		
	l waste			
D. Solic	l waste nagement			
D. Solid D2 Solid waste man D2.2 Solid waste re Intent: To improve separate	l waste nagement cycling	SCTool		
D. Solid D2 Solid waste man D2.2 Solid waste re Intent: To improve separate	waste nagement cycling e collection disposal, ave	SCTool		
D. Solid D2 Solid waste man D2.2 Solid waste re Intent: To improve separate burnin	waste nagement cycling e collection disposal, ave ng waste	SCTool		
D. Solid D2 Solid waste man D2.2 Solid waste re Intent: To improve separate burnin Indicator Total amount of solid waste that is recycled divided by the total amount of solid waste	waste nagement cycling e collection disposal, ave ng waste Unit of Measure %	SCTool		
D. Solid D2 Solid waste man D2.2 Solid waste read D2.2 Solid waste read Intent: To improve separate burning Indicator Total amount of solid waste that is recycled divided by the total amount of solid waste produced in the city Assessment Methodology 1. Calculate the total amount that is recycled in tonnes 2. Calculate the total amount in the city in tonnes in the 3. Calculate the value of the Mote: Recycled materials a diverted from the waste state	waste agement cycling e collection disposal, ave ng waste Unit of Measure % y: punt of the city's solid waste (A) - numerator bunt of solid waste produce city (B) - denominator the indicator as A/B (%) shall refer to those materia	sctool oiding e e ed		
D. Solid D2 Solid waste man D2.2 Solid waste man D2.2 Solid waste re Intent: To improve separate burnin Indicator Total amount of solid waste that is recycled divided by the total amount of solid waste produced in the city Assessment Methodology 1. Calculate the total amount that is recycled in tonnes 2. Calculate the total amount in the city in tonnes in the 3. Calculate the value of the Mote: Recycled materials a diverted from the waste st processed into new produ- permits and regulations.	waste nagement cycling e collection disposal, ave ng waste Unit of Measure % y: punt of the city's solid wast (A) - numerator ount of solid waste produce city (B) - denominator the indicator as A/B (%) shall refer to those materic tream, recovered and	sctool oiding e e ed		



E: Issue.

Ex:Category.

E1: Air quality.

E2: Noise.

E3: EMF exposure.

Ex.x :Criterion.

Intent: Description of the objective of the criterion.

Indicator: Name of the indicator to be calculated.

Unit of Measure: Measuring unit of each indicator.

Standard: The calculation standard for the criterion.

References: The acquiring source of information.

★ Key Performance Indicator

E. Environme	ental quality	SCTool		
E1 Air quality				
★ E1.2 Particulate matter (PM10) concentration				
Intent: To evaluate the quality of the air through the exceeded daily limits of pollutants (PM10)				
Indicator	Unit of Measure	9		
Annual average fine particulate matter (PM10) concentration	μg/m³			
Assessment Methodolog	y :			
 Collect the annual mean of PM10 concentration values measured over one year by each monitoring station installed in the city's boundaries Calculate the average of the values collected in the previous step as the sum of the annual mean PM10 concentration values (A) - numerator Calculate the number of monitoring stations (B) - denominator The result shall be expressed as the concentration of PM10 in micrograms per standard cubic metre (μg/m³) The result shall be expressed as the concentration of PM10 in micrograms per standard cubic metre (μg/m³) 				
	Reference: SO 37120: Sustainable cit communities - Indicators fo			

services and quality of life

E. Environme	ntal quality	SCTool
E1 Air quality		
E1. 1 Fine particulate	matter (PM2.5) concen	tration
Intent: To evaluate the qu exceeded daily limit Indicator	vality of the air throug s of pollutants (PM2.5) Unit of Measure	h the
Annual average fine particulate matter (PM2.5) concentration	μ g/m ³	
Assessment Methodolog	y:	
1. Collect the annual mea values measured over one station installed in the city	year by each monitoring	
	of the values collected in th of the annual mean PM2.5 numerator	
3. Calculate the number o (B) - denominator	f monitoring stations	
	essed as the concentration standard cubic metre (μg/	
- 1	Reference: SO 37120: Sustainable citi ommunities - Indicators fo ervices and quality of life	
Se		
🔬 E. Environme	ntal quality	SCTool
E1 Air quality		
E1. 3 Nitrogen Dioxid	e concentration (NO2)	
Intent: To evaluate the qu exceeded daily limi	vality of the air throug ts of pollutants (NO2)	h the
I Indicator	Unit of Measure	9
Sum of daily concentra- tions for the whole year divided by 365 days	μg/m³	

Assessment Methodology:

- 1. Calculate the mass of pollutant collected NO2 (µg) (A) - numerator
- 2. Calculate the volume of air sampled in standard cubic metres (µg/m3)
- 3. The result shall be expressed as the concentration of NO2 in micrograms per standard cubic metre (μ g/m³)

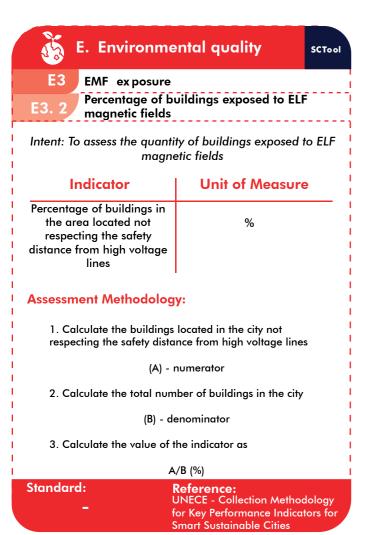
Reference: ISO 37120: Sustainable cities and Standard: communities - Indicators for city services and quality of life

E. Environme	ental quality	SCTool
E1 Air quality		
E1. 4 Sulfur Dioxide o	oncentration (SO ²)	
Intent: To evaluate the q exceeded daily lin	uality of the air throug hits of pollutants (SO ²)	gh the
Indicator	Unit of Measur	e
Sum of daily concentra- tions for the whole year divided by 365 days	µg/m³	
Assessment Methodolog	là:	
1. Calculate the mass of	pollutant collected SO2 (µg	1)
(A) -	numerator	
2. Calculate the volume of cubic metres (μg/m3)	of air sampled in standard	
(B) - d	enominator	
	ressed as the concentratior andard cubic metre (μg/m ³	
Standard:	Reference:	
	UNECE - Collection Metho for Key Performance Indica	
	UNECE - Collection Metho	
	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities	itors for
	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities	
	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities	itors for
E. Environme	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality	itors for
E. Environme E2 Noise E2.1 Noise pollution Intent: To promote acoust	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality	SCTool
E. Environme E2 Noise E2.1 Noise pollution Intent: To promote acoust	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality ic comfort, for a health	SCT001
E2 Noise E2 Noise E2.1 Noise pollution Intent: To promote acoust safe er	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality ic comfort, for a health avironment	SCT001
E2 Noise E2 Noise E2 Noise E2.1 Noise pollution Intent: To promote acoust safe er Indicator Population exposed to noise pollution divided by the total population of the	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality ic comfort, for a health avironment Unit of Measure %	SCT001
E2 Noise E2 Noise E2 Noise E21 Noise pollution Intent: To promote acoust safe er Indicator Population exposed to noise pollution divided by the total population of the city	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality ic comfort, for a health avironment Unit of Measure %	SCTool
E2 Noise E2 Noise E2 Noise E21 Noise pollution Intent: To promote acoust safe er Indicator Population exposed to noise pollution divided by the total population of the city Assessment Methodolog	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality ic comfort, for a health ivironment Unit of Measure %	SCTool
E2 Noise E2 Noise E2 Noise E2.1 Noise pollution Intent: To promote acoust safe er Indicator Population exposed to noise pollution divided by the total population of the city Assessment Methodolog	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality ic comfort, for a health wironment Unit of Measure % IV: on exposed to noise pollutionumerator	SCTool
E2 Noise E2 Noise E2 Noise E2 Noise E21 Noise pollution Intent: To promote acoust safe er Indicator Nopulation exposed to noise pollution divided by the total population of the city Assessment Methodolog 1. Calculate the population (A) -	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality ic comfort, for a health wironment Unit of Measure % IV: on exposed to noise pollutionumerator	SCTool
E. Environme E. Noise E. Noise E. Noise E. Noise E. Noise E. Noise Pollution Intent: To promote acoust safe er Indicator Indicator Nopulation exposed to noise pollution divided by the total population of the city Assessment Methodolog 1. Calculate the population (A) -	UNECE - Collection Metho for Key Performance Indica Smart Sustainable Cities ental quality ic comfort, for a health avironment Unit of Measure % y: on exposed to noise pollution numerator sulation of the city enominator	SCTool

Standard:

(B) - denominator

E. Environm	ental quality	SCTool
E1 Air quality		 ا
E1. 5 Ozone concent	ration (O³)	
Intent: To evaluate the c exceeded daily li	quality of the air throug mits of pollutants (O ³)	h the
Indicator	Unit of Measure	e
Sum of daily concentra- tions for the whole year divided by 365 days	µg/m³	
Assessment Methodolog	gy:	
Assessment method:		
 Calculate the mass of 	pollutant collected O^3 (µg)	
(A) -	numerator	
2. Calculate the volume cubic metres (μg/m3)	of air sampled in standard	
(B) - 0	denominator	
	pressed as the concentration andard cubic metre (µg/m³)	
Standard:	D.(
Signation and a second se	Reference:	
-	UNECE - Collection Method for Key Performance Indica	
-	UNECE - Collection Metho	
-	UNECE - Collection Method for Key Performance Indica	
E. Environm E3 EMF exposure E3. 1 Exposure to his fields	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality	tors for SCTool
- E. Environm E3 EMF exposure E3. 1 Exposure to his fields Intent: T o evaluate the	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma	sctool
- E. Environm E3 EMF exposure E3. 1 Exposure to his fields Intent: T o evaluate the	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq	sctool gnetic
- E. Environm E3 EMF exposure E3. 1 Exposure to hig fields Intent: T o evaluate the electrom	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq bagnetic fields	sctool gnetic
- E. Environm E3 EMF exposure E3.1 Exposure to hig fields Intent: T o evaluate the electrom Indicator Percentage of mobile network antenna sites in compliance with EMF	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq magnetic fields Unit of Measur %	sctool gnetic
E3 EMF exposure E3 EMF exposure E3.1 Exposure to hig fields Intent: T o evaluate the electrom Indicator Percentage of mobile network antenna sites in compliance with EMF exposure	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq magnetic fields Unit of Measur % gy: of mobile network antenno	sctool gnetic uency
E3 EMF exposure E3 EMF exposure E3.1 Exposure to hig fields Intent: T o evaluate the electrom Indicator Percentage of mobile network antenna sites in compliance with EMF exposure Assessment Methodolo	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq magnetic fields Unit of Measur % gy: of mobile network antenno	sctool gnetic
 E. Environm Exposure to higher fields Intent: T o evaluate the electron Indicator Indicator Percentage of mobile network antenna sites in compliance with EAF exposure Assessment Methodolo 1. Calculate the number sites in compliance with (A) -	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq magnetic fields Unit of Measur % gy: of mobile network antenno EMF exposure	sctool gnetic uency
 E. Environm Exposure to higher fields Intent: T o evaluate the electron Indicator Indicator Percentage of mobile network antenna sites in compliance with EMF exposure Assessment Methodolo 1. Calculate the number sites in compliance with (A) - 2. Calculate the total nusties in the city	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq agnetic fields Unit of Measure % gy: of mobile network antenna EMF exposure numerator	sctool gnetic uency
 E. Environm E3 EMF exposure Exposure to higher fields Intent: T o evaluate the electron Indicator Indicator Percentage of mobile network antenna sites in compliance with EMF exposure Assessment Methodolo Calculate the number sites in compliance with (A) - Calculate the total nu sites in the city 	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq agnetic fields Unit of Measur % gy: of mobile network antenna EMF exposure - numerator mber mobile network antenna denominator	sctool gnetic uency
 E. Environm E. Environm E. Environm E. Environm E. Environm E. Environm Exposure to higher fields Intent: T o evaluate the electron Indicator Indicator Percentage of mobile network antenna sites in compliance with EAF exposure Assessment Methodolo 1. Calculate the number sites in compliance with environ (A) - 2. Calculate the total nursites in the city (B) - 4	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality gh frequency electroma exposure to high freq agnetic fields Unit of Measur % gy: of mobile network antenna EMF exposure - numerator mber mobile network antenna denominator	sctool gnetic uency
 E. Environm E. Environm E. Environm E. Environm E. Environm E. Environm Exposure to higheds Intent: T o evaluate the electron Intent: T o evaluate the number exposure Intent: T o evaluate the number evaluate the total number evaluate the city 	UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities ental quality ental quality gh frequency electroma exposure to high freq aggnetic fields Unit of Measur % gy: of mobile network antenna EMF exposure - numerator mber mobile network antenna denominator of the indicator as	sctool gnetic uency e





Description of the Information

F: Issue.

- Fx:Category.
 - F1: Performance of mobility services.
 - F2: Green mobility.
 - F3: Safety in mobility.

Fx.x Criterion.

Intent: Description of the objective of the criterion.

Indicator: Name of the indicator to be calculated.

Unit of Measure: Measuring unit of each indicator.

Standard: The calculation standard for the criterion.

References: The acquiring source of information.

★ Key Performance Indicator

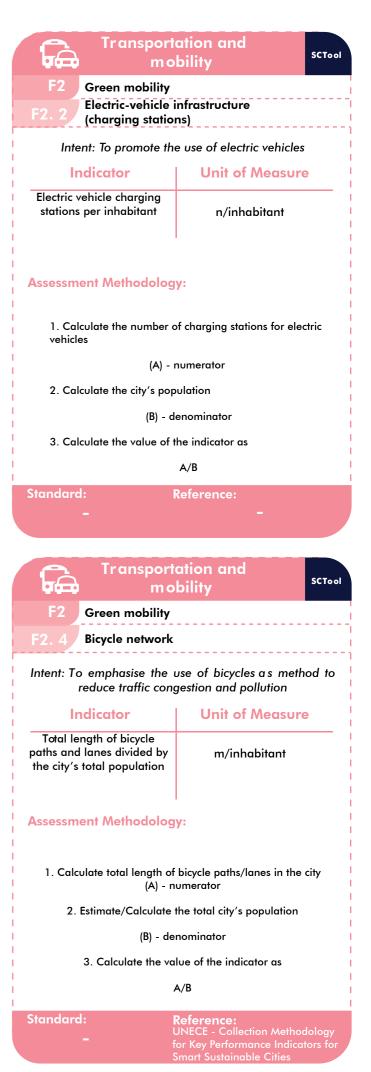
6	Transport mo	ation and bility	SCTool
F1	Pe rformance of	mobility services	
F1.2	Accessibility of p	oublic transportation se	rvice
Intent: T		roximity and connectiv ortation service	ity of
h	ndicator	Unit of Measure	•
that are v walking di transport running	ge of inhabitants within 500 meters istance of at public ation service stop at least every 20 uring peak periods	%	
Assessm	ent Methodolog	y:	
within		ber of inhabitants living ansit running at least every	20
	(A) - r	numerator	
2. Ca	lculate the total city	population	
	(B) - d	enominator	
3. Ca	lculate the value of t	he indicator as	
	A	√B (%)	
Standard	- i	Reference: SO 37120: Sustainable citi communities - Indicators fo ervices and quality of life	
74			

	ortation and nobility
	e of mobility services
F1. 1 Public transp	ort network
Intent: To assess city's tr	ransportation network availability
Indicator	Unit of Measure
Length of public transpo system per 1000 popula tion	rt 1- km/1000 inhabitants
Assessment Methodo	logy:
 Calculate the total I transport systems oper 	length (in kilometres) of the public rating within the city
A)	A) - numerator
2. Calculate the one 1 tion	.000th of the city's total popula-
(B)	- denominator
3. Calculate the value	of the indicator as
	A/B
Standard: –	Reference: ISO 37120: Sustainable cities and communities - Indicators for city services and quality of life
	ortation and nobility
F1 Performance	of mobility services
F1.3 Usage of put	blic transportation by population
Intent: To evaluate	the usage of public transport
Indicator	Unit of Measure
Total annual number of public transport trips originating in the city divided by the total city population	trips/inhabitant
Assessment Methodo	logy:
	annual number of public transport
 Calculate the total of trips originating in the 	annual number of public transport
 Calculate the total of trips originating in the 	annual number of public transport city A) - numerator
 Calculate the total of trips originating in the (A Calculate the total of 	annual number of public transport city A) - numerator
 Calculate the total of trips originating in the (A Calculate the total of 	annual number of public transport city A) - numerator city population - denominator

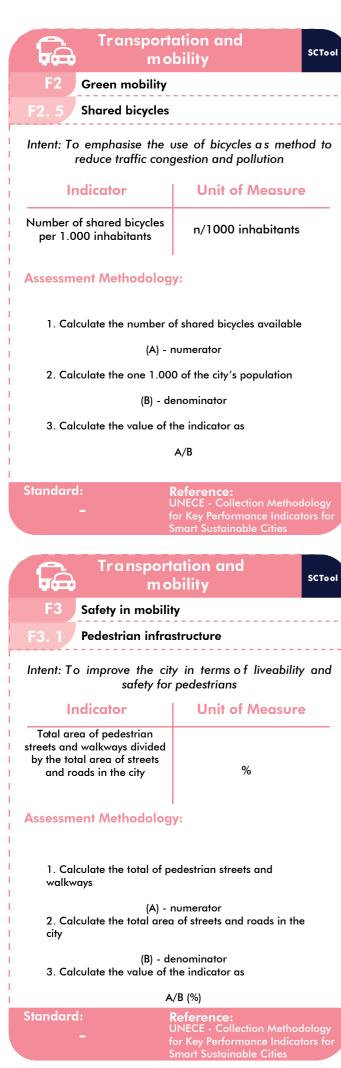
	rtation and obility
F2 Green mobility	,
F2.1 Shared vehicle	s
Intent: To promote an alt	ernative form of transportation
Indicator	Unit of Measure
Number of shared vehicles per 1000 inhabitants	n/1000 inhabitants
Assessment Methodolo	gy:
1. Calculate the r	number of shared vehicles
(A)	- numerator
2. Calculate the one 1	.000th of the city's population
(B) -	denominator
3. Calculate the	value of the indicator as
	A/B
Standard: –	Reference: UNECE - Collection Methodology for Key Performance Indicators for Smart Sustainable Cities
	rtation and
	obility
F2 Green mobility	
F2. 3 Low-Carbon E	mission Passenger Vehicles
Intent: To reduce	fossil fuel consumption
Indicator	Unit of Measure
Percentage of low-carbon emission passenger vehicles	
	%
Assessment Methodolo	gy:
	nber of low emission vehicles red (PHEV & EV)
	- numerator
	number of total vehicles
	denominator
	value of the indicator as A/B (%)
Standard: –	Reference: UNECE - Collection Methodology for Key Performance Indicators for

ustainable Citie

SCTool MED



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	Turnersent	autions and	
6	Transport mo	ation and bility	SCTool
F2	Green mobility		
F2.6	Green public ve	hicles	
I	ntent: To reduce fo	ossil fuel consumption	
h	ndicator	Unit of Measure	
emissior divided b	number of low n public vehicles y total number of olic vehicles	%	
Assessm	ent Methodolog	у:	
1. Ca		of low emission public vehic numerator	les
2. C		tal number of public vehicle enominator	es
		alue of the indicator as /B (%)	
Electri	mission vehicles are c Vehicles (EVs) n Hybrid-Electric Veł		
Standard		Reference:	
		JNECE - Collection Method for Key Performance Indicate Smart Sustainable Cities	
	Transport	ation and	
bà		bility	SCTool
F 3	Safety in mobilit	ły	
F3. 2	Availability of si	dewalks	
			ant of
Intent: To		nnectivity, as a key eleme accessibility	
		nnectivity, as a key eleme accessibility Unit of Measure	
Ir Percentag that h	spatial o	accessibility	
Percentag that k s	spatial on spatial of e of roads' length has dedicated	uccessibility Unit of Measure %	
Percentag that H s	spatial of ndicator e of roads' length has dedicated idewalks ent Methodolog Calculate the roads'	uccessibility Unit of Measure %	
Ir Percentag that H s Assessm	spatial of ndicator e of roads' length has dedicated idewalks ent Methodolog Calculate the roads' side (A) - n	uccessibility Unit of Measure % y: length that has dedicated	
Ir Percentag that H s Assessm	spatial of ndicator e of roads' length has dedicated idewalks ent Methodolog Calculate the roads' side (A) - n alculate the total len (B) - de	v: Unit of Measure % y: length that has dedicated ewalks umerator	
Ir Percentag that h s Assessm	spatial of ndicator e of roads' length has dedicated idewalks ent Methodolog Calculate the roads' side (A) - n alculate the total len (B) - de 3. Calculate the va	y: unit of Measure % y: length that has dedicated ewalks umerator ngth of the roads in the city enominator	
Ir Percentag that H s Assessm	spatial of adicator e of roads' length as dedicated idewalks ent Methodolog Calculate the roads' (A) - n alculate the total len (B) - de 3. Calculate the va A/	y: uncessibility Unit of Measure % y: length that has dedicated ewalks umerator ngth of the roads in the city enominator lue of the indicator as	
Ir Percentag that h s Assessm 1. 4 2. C	spatial of adicator e of roads' length as dedicated idewalks ent Methodolog Calculate the roads' (A) - n alculate the total len (B) - de 3. Calculate the va A/	Unit of Measure Unit of Measure % y: length that has dedicated ewalks umerator ngth of the roads in the city phominator lue of the indicator as B (%) Reference: CESBA MED Project – SNTco assessment system	

Transport mo	ation and bility
F3 Safety in mobili	ły
F3. 3 Safety of bicycle	lines
Intent: To promote bicycle	as alternative vehicle from car
Indicator	Unit of Measure
Percentage of bicycle paths physically separated from traffic roads	%
Assessment Methodolog	y :
 Calculate the length of separated from traffic roa 	
(A) - I	numerator
2. Calculate the total leng	th of bicycle paths in the city
(B) - de	enominator
3. Calculate the value of t	he indicator as
A	х/В (%)
	Reference: CESBA MED Project – SNTool
and the second secon	assessment system
Transport mo	ation and bility
	bility SCTOOL
to mo	bility SCTOOL
F3 Safety in mobilit F3. 5 Traffic fatalities	bility SCTOOL
F3 Safety in mobilit F3. 5 Traffic fatalities	bility SCTOOL
F3 Safety in mobilit F3. 5 Traffic fatalities Intent: To reduce the	bility sctool ty need to use private cars
F3Safety in mobilityF3Safety in mobilityF3.5Traffic fatalitiesIntent: To reduce theIndicatorNumber of taxi licensesdivided by 1000th of the	bility SCTOOL by need to use private cars Unit of Measure n/1000 inhabitants
F3 Safety in mobility F3 Safety in mobility F3.5 Traffic fatalities Intent: To reduce the Indicator Number of taxi licenses divided by 1000th of the city's population Assessment Methodology 1. Calculate the number of taxi	bility SCTool by need to use private cars Unit of Measure n/1000 inhabitants y: of taxi licenses
F3 Safety in mobility F3 Safety in mobility F3 Traffic fatalities F3 Traffic fatalities Intent: To reduce the Indicator Number of taxi licenses divided by 1000th of the city's population Assessment Methodology 1. Calculate the number of (A) - model	bility SCTool by need to use private cars Unit of Measure n/1000 inhabitants y: of taxi licenses
F3 Safety in mobility F3 Safety in mobility F3.5 Traffic fatalities Intent: To reduce the Indicator Number of taxi licenses divided by 1000th of the city's population Assessment Methodology 1. Calculate the number of (a) - a 2. Calculate one 1.000 of 1.	bility SCTool by need to use private cars Unit of Measure n/1000 inhabitants y: of taxi licenses numerator the city's population
F3 Safety in mobility F3 Safety in mobility F3.5 Traffic fatalities Intent: To reduce the Indicator Indicator Indicator Number of taxi licenses divided by 1000th of the city's population Indicator Assessment Methodology 1. Calculate the number of (A) - f(A)	bility Scrool by need to use private cars Unit of Measure n/1000 inhabitants y: of taxi licenses numerator i the city's population enominator
F3 Safety in mobility F3 Safety in mobility F3.5 Traffic fatalities Intent: To reduce the Indicator Indicator Indicator Number of taxi licenses divided by 1000th of the city's population Assessment Methodology 1. Calculate the number of (A) = 1 2. Calculate one 1.000 of (B) = de 3. Calculate the value of	bility SCTool by need to use private cars Unit of Measure n/1000 inhabitants y: of taxi licenses numerator the city's population enominator the indicator as
F3 Safety in mobility F3 Safety in mobility F3.5 Traffic fatalities Intent: To reduce the Indicator Number of taxi licenses divided by 1000th of the city's population Assessment Methodology 1. Calculate the number of (A) - 1 2. Calculate one 1.000 of (B) - du 3. Calculate the value of the	bility SCTool by need to use private cars Unit of Measure n/1000 inhabitants y: of taxi licenses numerator i the city's population enominator the indicator as /B (%)
F3 Safety in mobility F3 Safety in mobility F3 Traffic fatalities Intent: To reduce the Indicator Indicator Indicator Number of taxi licenses Givided by 1000th of the city's population Assessment Methodology ($(a) - a)$ 1. Calculate the number of $(a) - a$ ($b) - a$ 3. Calculate the value of the city	bility SCTool by need to use private cars Unit of Measure n/1000 inhabitants y: of taxi licenses numerator the city's population enominator the indicator as

A	Transport mo	ation and bility	SCTool
F3 Saf	ety in mobilit	y	I
F3. 4 Tra	ffic fatalities		
	Intent: To ass	sess road safety	
Indic	ator	Unit of Measure) 9
Traffic fatalitie 1000th of popula	the city's	n/1000 inhabitants	
Assessment	Methodolog	y:	
1. Calculat	e the number c	of traffic fatalities	1
	(A) - r	numerator	
2. Calculat	e one 1.000 of	the city's population	1
	(B) - de	enominator	1
3. Calculat	e the value of t	he indicator as	i i
	A	/B (%)	
Standard:	I	Reference:	

UNECE - Collection Methodology for Key Performance Indicators for Smart Sustainable Cities



Description of the Information

G: Issue.

Gx:Category.

G1: Accessibility (disabled persons) . G2: Housing. G3: Availability of public and private facilities and services. **G4: Education. G5: Social inclusion.** G6: Safety. G7: Health. G8: Food security. Gx.x Criterion. **Intent:** Description of the objective of the criterion. **Indicator:** Name of the indicator to be calculated. Unit of Measure: Measuring unit of each indicator. **Standard:** The calculation standard for the criterion. **References:** The acquiring source of

information.
 Key Performance Indicator

G. Socia	l Aspects	SCTool
G1 Accessibility (dis G1.2 Barrier-free acc public areas	sabled persons) essibility in local outdo	or
Intent: T o evaluate the c resources using s	accessibility o f various spatial data analysis	urban
Indicator	Unit of Measure	e
Percentage of accessible public outdoor areas that are barrier-free compared to the total public area	%	
Assessment Methodolog	j y :	
	ublic facilities that may be ns with physical disabilities	
2. Assess the accessibility considering all major disc	· · · ·	
 Establish the percent o may be considered access 	f public outdoor facilities th sible.	at
	Reference: CESBA MED Project – SNTo assessment system	ol

G. Social	Aspects	SCTool
G1 Accessibility (dis	abled persons)	
G1.1 Accessibility of p	oublic buildings	ו ו
Intent: To assess the abi visitors with physical disabi cal access to		
Indicator	Unit of Measure	e
Total number of public buildings accessible by disabled persons divided by the total number of public buildings	%	
Assessment Methodolog	y:	1
	culated as the total number e by disabled persons divid blic buildings.	
acquire the same informa interactions, and enjoy the without a disability in an e integrated manner, with s use. A disability refers to a phy	afforded the opportunity to tion, engage in the same e same services as a perso equally effective and equal ubstantially equivalent eas	I n I ly I e of I I
Standard:	Reference:	I
_	CESBA MED Project – SNTo assessment system	ol
G. Social	Aspects	SCTool
G1 Accessibility (dis		SCTool
G1 Accessibility (dis		
G1 Accessibility (dis G1.3 Accessibility of p Intent: To facilitate the a	sabled persons) public transport networ	ʻk
G1 Accessibility (dis G1.3 Accessibility of p Intent: To facilitate the a	sabled persons) public transport networ access to public transpo	• k ort by
G1 Accessibility (dis G1.3 Accessibility of p Intent: To facilitate the a physically di Indicator Total number of public vehicles accessible to disabled persons divided by total number of public	sabled persons) public transport networ access to public transpo isabled persons	• k ort by
G1 Accessibility (dis G1.3 Accessibility of p Intent: To facilitate the a physically di Indicator Total number of public vehicles accessible to disabled persons divided by total number of public vehicles	sabled persons) public transport networ access to public transport isabled persons Unit of Measure %	•k ort by
G1 Accessibility (dis G1.3 Accessibility of p Intent: To facilitate the a physically di Indicator Total number of public vehicles accessible to disabled persons divided by total number of public vehicles Assessment Methodolog 1. Calculate the number of are accessible disabled per (A) - numerator	sabled persons) public transport networ isabled persons Unit of Measure %	rk ort by
G1 Accessibility (dis G1.3 Accessibility of p Intent: T o facilitate the a physically di Indicator Total number of public vehicles accessible to disabled persons divided by total number of public vehicles Assessment Methodolog 1. Calculate the number of are accessible disabled per	sabled persons) public transport networ isoabled persons Unit of Measure % y: of public transport vehicles ersons aber of public transport	e
G1 Accessibility (dis G1.3 Accessibility of p Intent: To facilitate the a physically di Indicator Indicator Total number of public vehicles accessible to disabled persons divided by total number of public vehicles Assessment Methodolog 1. Calculate the number of are accessible disabled per (A) - numerator 2. Calculate the total num vehicles in the city (B) - denominator 3. Calculate the value of the A/B (%)	sabled persons) public transport networ isoabled persons Unit of Measure % y: of public transport vehicles ersons aber of public transport	rk ort by e

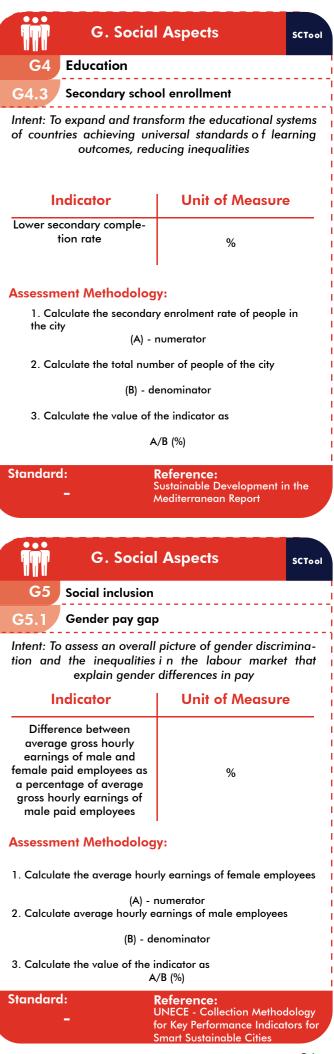
G. Social Aspects SCTool G2 Housing G2.1 Affordability of housing property Intent: To assess the affordability of housing property in the city Indicator Unit of Measure Housing properties in the % city that are financially accessible to the lowest quintile of area population Assessment Methodology: 1. Calculate the number of housing properties in the city that are financially accessible to the lowest quintile of area population (A) - numerator 2. Calculate the total number of housing properties in the city (B) - denominator 3. Calculate the value of the indicator as A/B (%) Reference: CESBA MED Project – SNTcol Standard: assessment system **G. Social Aspects** SCTool G2 Housing G2.3 Vacant residential units Intent: To understand the current and future housing needs in the city Indicator Unit of Measure Percentage of vacant % residential units Assessment Methodology: 1. Calculate the number of unoccupied dwellings (A) - numerator 2. Calculate the total number of dwellings in the city (B) - denominator 3. Calculate the value of the indicator as A/B (%) Standard: Reference: ISO 37120: Sustainable cities and communities - Indicators for city services and quality of life

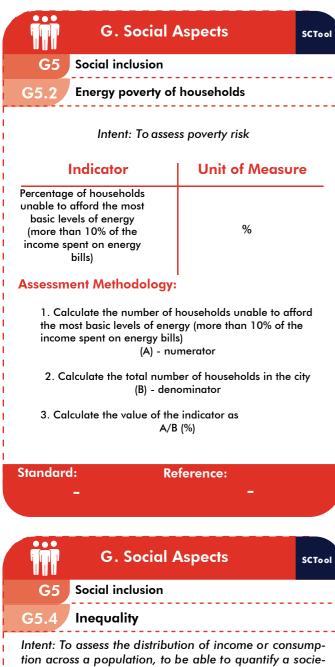
G. Socia	Aspects	SCTool
G2 Housing		
G2.2 Affordability of	housing rental	
Intent: T o assess the aff property for low-inco	fordability of housing ome residents in the city	rental
Indicator	Unit of Measure	e
Percentage of the average salary of the lowest quintile of the population used for rental payments	%	
Assessment Methodolog	ıy:	
the city that are financiall residents	of housing rental property i y accessible to low-income	
	numerator	i
Calculate the total nun in the city	nber of housing rental prop	berty
(B) - d	enominator	
3. Calculate the value of A	the indicator as A/B (%)	
		I
	Reference: CESBA MED Project – SNTo assessment system	ol
G. Socia	l Aspects	SCTool
G. Socia G2 Housing	Aspects	SCTool
		SCTool
G2 Housing	nents tent of the challenges fo	or the
G2 Housing G2.4 Informal settlen Intent: To evaluate the ext	nents tent of the challenges fo	or the and
G2.4 Housing G2.4 Informal settlen Intent: To evaluate the ex- reporting city in meeting	nents tent of the challenges fo shelter needs and demo	or the and
G2. Housing G2.4 Informal settlen Intent: To evaluate the ext reporting city in meeting Indicator Area of informal settle- ments within the city boundary divided by the	nents tent of the challenges for shelter needs and demo Unit of Measure %	or the and
G2 Housing G2.4 Informal settlen Intent: To evaluate the extreporting city in meeting Indicator Area of informal settle- ments within the city boundary divided by the city area Assessment Methodolog 1. Calculate the area of inform boundary (in square kilometro 2. Calculate the city area in stor	nents tent of the challenges for shelter needs and demo Unit of Measure % % y: mal settlements within the es) (A) - numerator quare kilometres (B) - deno	or the and e
G2 Housing G2.4 Informal settlen Intent: To evaluate the ext reporting city in meeting Indicator Area of informal settle- ments within the city boundary divided by the city area Assessment Methodolog 1. Calculate the area of inform boundary (in square kilometro 2. Calculate the city area in s tor 3. Calculate the value of the i Note: The UN Statistics Divisi definitions of informal settler a) Areas where groups of hou on land that the occupants ho	nents tent of the challenges for shelter needs and demo Unit of Measure % (N): mal settlements within the es) (A) - numerator quare kilometres (B) - deno indicator as A/B (%) on has developed the follow tents: using units have been const ave no formal legal claim to	city city omina- wing tructed o.
G2 Housing G2.4 Informal settlen Intent: To evaluate the extreporting city in meeting Indicator Area of informal settle- ments within the city boundary divided by the city area Assessment Methodolog 1. Calculate the area of inform boundary (in square kilometre 2. Calculate the city area in stor 3. Calculate the value of the in Note: The UN Statistics Divisi definitions of informal settlem a) Areas where groups of hou on land that the occupants ho b) Unplanned settlements and compliance with current plant (unauthorized housing). While many informal settlements	nents tent of the challenges for shelter needs and demo Unit of Measure % ///////////////////////////////////	city city omina- wing tructed o. ot in ons n of
 G2 Housing G2.4 Informal settlen Intent: To evaluate the extreporting city in meeting Indicator Area of informal settlements within the city boundary divided by the city area Assessment Methodolog 1. Calculate the area of information settlements with a square kilometre 2. Calculate the city area in stor 3. Calculate the value of the into a stor 3. Calculate the value of the into a stor a. Calculate the value of the into a stor b. Calculate the value of the into a stor b. Calculate the value of the into a stor b. Unplanned settlements and compliance with current plant (unauthorized housing). While many informal settlements are not synore that do not meet the definition 	nents tent of the challenges for shelter needs and demo Unit of Measure % () () () () () () () () () () () () ()	city city omina- wing tructed o. ot in ons n of
G2 Housing G2.4 Informal settlem Intent: To evaluate the extreporting city in meeting Indicator Area of informal settlem ments within the city boundary divided by the city area Assessment Methodolog 1. Calculate the area of inform boundary (in square kilometre 2. Calculate the city area in st for 3. Calculate the value of the in Note: The UN Statistics Division definitions of informal settlem a) Areas where groups of how on land that the occupants how b) Unplanned settlements and compliance with current plant (unauthorized housing). While many informal settlements slum, the terms are not synor that do not meet the definition	nents tent of the challenges for shelter needs and demo Unit of Measure % ///////////////////////////////////	or the and e city pomina- wing tructed point on of n areas ies and

G. Social	Aspects	SCTool
G3 Availability of pu	olic and private facilities	
G3.1 Basic service pro		
Intent: To assess the overal	I liveability and quality of	of life
l I		
Indicator	Unit of Measure	9
Number of inhabitants who live near at least one basic service divided by the total population of the city	%	
Assessment Methodolog	y:	
 Calculate the number of least one basic service 	of inhabitants who live nea	r at
(A) - I	numerator	
2. Calculate the total pop	ulation of the city	
(B) - de	enominator	
 3. Calculate the value of t 	he indicator as	
і А І	/B (%)	
Standard:	Reference:	
-	SO 37120: Sustainable cit communities - Indicators fo	
2	ervices and quality of life	
G. Social	Aspects	SCTool
	olic and private facilities	
G3.3 Open space for	r public use	
Intent: To provide import	ant recreation opportu	unities
dccessible i	by inhabitants	
Indicator	Unit of Measure	9
Total area of shores/bea- ches in the city area that		
are accessible by inhabi- tants divided by the total area of shores/beaches in the city's urban area	%	
tants divided by the total area of shores/beaches in		
tants divided by the total area of shores/beaches in the city's urban area Assessment Methodolog	y: 1 of shores/beaches in the	city
tants divided by the total area of shores/beaches in the city's urban area Assessment Methodolog 1. Calculate the total area area that are accessible b	y: 1 of shores/beaches in the y inhabitants numerator	city
tants divided by the total area of shores/beaches in the city's urban area Assessment Methodolog 1. Calculate the total area area that are accessible b (A) - 2. Calculate the total area city's urban area	y: 1 of shores/beaches in the y inhabitants numerator	city
tants divided by the total area of shores/beaches in the city's urban area Assessment Methodolog 1. Calculate the total area area that are accessible b (A) - 2. Calculate the total area city's urban area (B) - de 3. Calculate the value of t	y: of shores/beaches in the y inhabitants numerator of shores/beaches in the enominator	city
tants divided by the total area of shores/beaches in the city's urban area Assessment Methodolog 1. Calculate the total area area that are accessible b (A) - 2. Calculate the total area city's urban area (B) - de 3. Calculate the value of t A	y: of shores/beaches in the y inhabitants numerator of shores/beaches in the enominator he indicator as	

G. Social	Aspects	SCTool
Avgilghility of pu	blic and private facilities	301001
and services		
G3.2 Open space for		
Intent: To ensure that publi local cultural values is	ic open space compatible provided in large projec	
Indicator	Unit of Measure	•
Average share of the built-up area of the city that is open space for public use	%	
Assessment Methodolog	ly:	
 Calculate the share of that is open space for put 	the built-up area of the cit blic use	у
(A) -	numerator	
2. Calculate the total area	a of the city	
(B) - d	enominator	
3. Calculate the value of t	the indicator as	
A	v/В (%)	
Standard:	Reference:	
	A CHIEF A CHIE	
	CESBA MED Project – SNTo	ol
		ol
-	CESBA MED Project – SNTa assessment system	ol
G. Social	CESBA MED Project – SNTa assessment system	SCTool
G. Social G4 Education	CESBA MED Project – SNTa assessment system	
G. Social	CESBA MED Project – SNTa assessment system	
G. Social G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un	CESBA MED Project – SNTo assessment system Aspects ment rate sform the educational sy	SCTool rstems
G. Social G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un	CESBA MED Project – SNTo assessment system Aspects nent rate sform the educational sy iversal standards of lea	SCTool stems arning
G. Social G. Soc	CESBA MED Project – SNTo assessment system Aspects nent rate sform the educational sy iversal standards of lea ucing inequalities	SCTool stems irrning
G. Social G. Social District of countries achieving un outcomes, red Indicator Net primary enrolment rate	CESBA MED Project – SNTo assessment system	SCTool stems irrning
G. Social G. Soc	CESBA MED Project – SNTo assessment system	SCTool rstems irrning
G. Social G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un outcomes, red Indicator Net primary enrolment rate Assessment Methodolog 1. Calculate the net primary e	CESBA MED Project – SNTo assessment system	SCTool rstems irrning
G. Social G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un outcomes, red Indicator Net primary enrolment rate Assessment Methodolog 1. Calculate the net primary e	CESBA MED Project – SNTo assessment system	SCTool rstems irrning
G. Social G4 Education G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un outcomes, red Indicator Net primary enrolment rate Assessment Methodolog 1. Calculate the net primary end city (A) - n 2. Calculate the total number	CESBA MED Project – SNTo assessment system	SCTool
G. Social G4 Education G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un outcomes, red Indicator Net primary enrolment rate Assessment Methodolog 1. Calculate the net primary end city (A) - n 2. Calculate the total number	CESBA MED Project - SNTo assessment system	SCTool
G. Social G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un outcomes, red Indicator Net primary enrolment rate Assessment Methodolog 1. Calculate the net primary e city (A) - 1 2. Calculate the total number (B) - de 3. Calculate the value of the i	CESBA MED Project - SNTo assessment system	SCTool
G. Social G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un outcomes, red Indicator Net primary enrolment rate Assessment Methodolog 1. Calculate the net primary end city (A) - 1 2. Calculate the total number (B) - de 3. Calculate the value of the in A	CESBA MED Project – SNTor assessment system	SCTool estems irrning
G. Social G4 Education G4.1 Primary enrollm Intent: To expand and trans of countries achieving un outcomes, red Indicator Net primary enrolment rate Assessment Methodolog 1. Calculate the net primary en- city (A) - 1 2. Calculate the net primary en- city (B) - de 3. Calculate the value of the in A	CESBA MED Project – SNTor assessment system	SCTool estems ming

G. Socia	Asp	ects	SCTool
G4 Education			
G4.2 Female school- schools	aged p	opulation enroll	ed in
Intent: To mon	itor wo	man rights	
Indicator		Unit of Measu	Jre
Number of city's female school population enrolled at prima secondary levels in public private schools divided by the number of a city's femal school-aged population	ry and and e total e	%	
Assessment Methodolog	י ו א :		
1 2. Calculate the total num 1 school-aged population 1 (B) - d 1 3. Calculate the value of	mary ar numera nber of o enomin	nd secondary levels tor a city's female ator	
I Note: Part-time enrolmen be counted as a full-time			11
Standard:	Refere Sustaina	nce: able Development i	n the
		ranean Report	
G4 Education	Asp	ects	SCTool
G. Socia G4 Education G4.4 Tertiary educa		ects	SCTool
G4 Education	tion sform t iversal	he educational sy standards o f lec	rstems
G4 Education G4.4 Tertiary educa Intent: To expand and tran of countries achieving un	tion sform t iversal ucing i	he educational sy standards o f lec	rstems urning
G4.4 Education G4.4 Tertiary educa Intent: To expand and tran of countries achieving un outcomes, red	tion sform t iversal ucing i	he educational sy standards of lec nequalities	rstems urning
G4 Education G4.4 Tertiary education Intent: To expand and trans of countries achieving un outcomes, red Indicator Population age 25-34 with tertiary educational	tion sform t iversal ucing i U	he educational sy standards of lec nequalities nit of Measure	rstems urning
G4 Education G4.4 Tertiary education Intent: To expand and trans of countries achieving un outcomes, red Indicator Population age 25-34 with tertiary educational attainment Assessment Methodolog	tion sform t iversal ucing in U	he educational sy standards of lec nequalities nit of Measure % 25-34 with tertiary	rstems urning
G4 Education G4.4 Tertiary education Intent: To expand and transof countries achieving unsoutcomes, red Indicator Population age 25-34 with tertiary educational attainment Assessment Methodolog 1. Calculate the population educational attainment in (A) - 2. Calculate the total numof the city	tion sform t iversal ucing i U U versal	he educational sy standards of lea nequalities nit of Measure % 25-34 with tertiary tor population age 25-	rstems irning
G4 Education G4.4 Tertiary education Intent: To expand and trans of countries achieving un outcomes, red Indicator Population age 25-34 with tertiary educational attainment Assessment Methodolog 1. Calculate the population educational attainment in (A) - 2. Calculate the total num of the city (B) - d 3. Calculate the value of	tion sform t iversal ucing i U U versal U versal versal ucing i U versal ucing i ucing i ucin	he educational sy standards of lea nequalities nit of Measure % 25-34 with tertiary tor population age 25- ator	rstems irning
G4 Education G4.4 Tertiary education Intent: To expand and trans of countries achieving un outcomes, red Indicator Population age 25-34 with tertiary educational attainment Assessment Methodolog 1. Calculate the population educational attainment in (A) - 2. Calculate the total num of the city (B) - d 3. Calculate the value of	tion sform t iversal ucing i U U versal versal versal versal versal ucing i U versal ucing i ucing i	he educational sy standards of lea nequalities nit of Measure % 25-34 with tertiary tor population age 25- ator	rstems irning
G4 Education G4.4 Tertiary education Intent: To expand and trans of countries achieving undoutcomes, red Indicator Population age 25-34 with tertiary educational attainment Assessment Methodolog 1. Calculate the population educational attainment in (A) - 2. Calculate the total numo of the city (B) - d 3. Calculate the value of	tion sform t iversal ucing ii U y: on age 2 the city numera aber of p enomin the indiv //B (%) Refere Sustain	he educational sy standards of lea nequalities nit of Measure % 25-34 with tertiary for population age 25- ator cator as	rstems urning

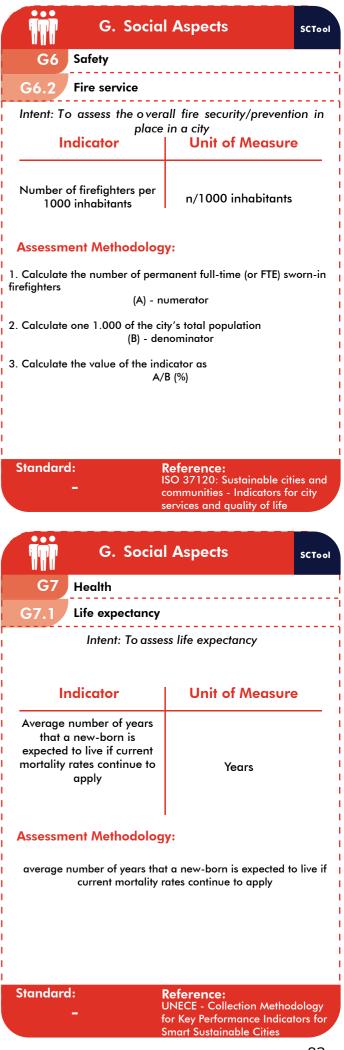


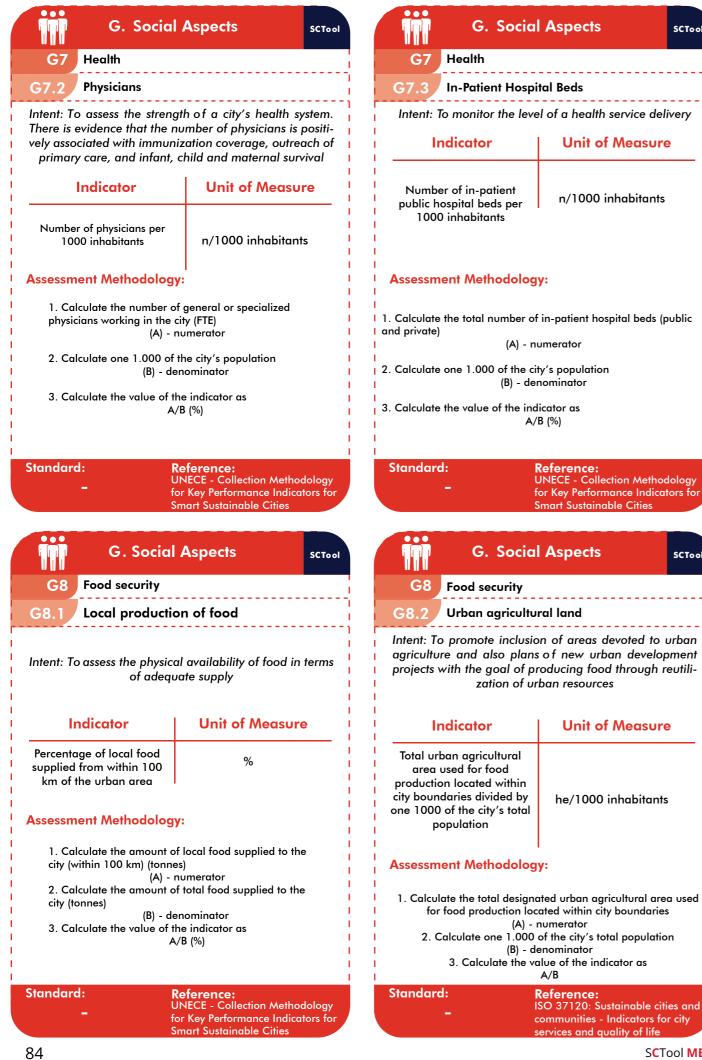


G5.4 Inequality	
tion across a population, i	bution of income or consump- to be able to quantify a socie- ive inequality
Indicator	Unit of Measure
Gini coefficient of inequality	n
Assessment Methodolog	<u>a</u> y:
	known as the "Gini Index" or e of statistical dispersion that ng incomes or levels of
the Lorenz curve diagram of perfect equality and Lo	ined as a ratio of the areas on . If the area between the line orenz curve is A, and the area B, then the Gini coefficient is
all income or consumptio	esses perfect equality, where n values are the same. of one expresses maximal
	Reference: ISO 37120: Sustainable cities an
-	communities - Indicators for city services and quality of life
82	

G. Social	Aspects	SCTool
G5 Social inclusion		
G5.3 Population living	g below poverty line	
	sess poverty risk	
Indicator	Unit of Measure	9 I
Number of people living below the national poverty line set at country level divided by the total current population of the city	%	
Assessment Methodolog	у:	1
 Calculate the number of peopoverty line set at country level Calculate the total current ponator Calculate the value of the inc 	(A) - numerator pulation of the city (B) - de	
Note: The total number of peop national poverty line shall be de number of city households at or the current average number of city.	le in the city living below th termined by multiplying th below the national poverty	e y line by
The poverty line refers to the mi adequate in a particular country income considered adequate in	. It is the minimum level of	
	Reference: Sustainable Development in Mediterranean Report	n the
G5.5 Voter participati	Aspects	SCTool
G5 Social inclusion G5.5 Voter participati Intent: To assess p ublic's	on	
G5 Social inclusion G5.5 Voter participati Intent: To assess p ublic's	on level of participation	and
G5 Social inclusion G5.5 Voter participati Intent: To assess p ublic's degree of interest	on level of participation in local government	and
G5 Social inclusion G5.5 Voter participation Intent: To assess public's degree of interest Indicator Percentage of the eligible population that voted during the last municipal	on a level o f participation in local government Unit of Measure %	and
G5 Social inclusion G5.5 Voter participation Intent: To assess public's degree of interest Indicator Percentage of the eligible population that voted during the last municipal election Assessment Methodolog 1. Calculate the number of per municipal election	ion s level o f participation in local government Unit of Measure %	e and
G5 Social inclusion G5.5 Voter participation Intent: To assess public's degree of interest Indicator Percentage of the eligible population that voted during the last municipal election Assessment Methodolog 1. Calculate the number of per municipal election (A) - 1	ion is level o f participation in local government Unit of Measure % Y: ersons who voted in the lass numerator	e and
G5 Social inclusion G5.5 Voter participation Intent: To assess public's degree of interest Indicator Percentage of the eligible population that voted during the last municipal election Assessment Methodolog 1. Calculate the number of per municipal election (A) - 1 2. Calculate the total number (B) - de 3. Calculate the value of the i	ion is level o f participation in local government Unit of Measure % y: ersons who voted in the lass numerator of registered voters in the enominator	e and
G5 Social inclusion G5.5 Voter participati Intent: To assess p ublic's degree of interest Indicator Percentage of the eligible population that voted during the last municipal election 1. Calculate the number of per municipal election (A) - 1 2. Calculate the total number (B) - de 3. Calculate the value of the in A	ion in local government Unit of Measure % y: ersons who voted in the lass numerator of registered voters in the enominator ndicator as	t city

G. Socia	Aspects	SCTool
G6 Safety		
G6.1 Police service		
l		
Intent: To assess the overa	ll crime prevention in p ı city	lace in
Indicator	Unit of Measu	Jre
I		
Number of police officers per 1000 inhabitants	n/1000 inhabitar	nts
Assessment Methodolog		
1	of permanent full-time (or	
sworn-in police officers	· ·	F1 E)
1	numerator	_
2. Calculate one 1.000 o (B) - d	enominator	I
3. Calculate the value of	the indicator as \/B (%)	
· · ·		
1		
_	Reference: ISO 37120: Sustainable ci	
	communities - Indicators f services and quality of life	
G. Socia	Aspects	SCTool
	Aspects	SCTool
G. Socia		
G. Socia G6 Safety G6.3 Population livi	ing in disaster prone on living in areas sub	e areas
G. Socia G6 Safety G6.3 Population livi Intent: To assess p opulati significant risk of death or hazards: cyclones, drough	ng in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes,	e areas ject to minent
G. Socia G6 Safety G6.3 Population livi Intent: To assess p opulati significant risk of death or hazards: cyclones, drough	ing in disaster prone on living in areas sub damage caused by pro	e areas ject to minent
G. Socia G6 Safety G6.3 Population livi Intent: To assess p opulati significant risk of death or hazards: cyclones, drough	ng in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes,	e areas ject to minent volca-
G. Socia G6 Safety G6.3 Population livit Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes an Indicator Percentage of inhabitants	ng in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measu	e areas ject to minent volca-
G. Socia G6 Safety G6.3 Population livi Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes an Indicator	ng in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides	e areas ject to minent volca-
G. Social G6 Safety G6.3 Population livit Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes an Indicator Percentage of inhabitants living in a zone subject to natural hazards	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur %	e areas ject to minent volca-
G. Social G6 Safety G6.3 Population livit Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes an Indicator Percentage of inhabitants living in a zone subject to	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur %	e areas ject to minent volca-
G. Social G6 Safety G6.3 Population live Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes an Indicator Percentage of inhabitants living in a zone subject to natural hazards Assessment Methodolog 1. Calculate the total num	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measu % Y: hber of city inhabitants livi	e areas ject to minent volca- re
G. Social G6 Safety G6.3 Population livit Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes an Indicator Percentage of inhabitants living in a zone subject to natural hazards Assessment Methodolog 1. Calculate the total num areas subject to significar caused by prominent haz	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur % V: hber of city inhabitants livit trisk of death or damage ards	e areas ject to minent volca- re
G. Social G6 Safety G6.3 Population live Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes and Indicator Percentage of inhabitants living in a zone subject to natural hazards Assessment Methodolog 1. Calculate the total num areas subject to significar caused by prominent haz (A) -	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur % y: hber of city inhabitants livit trisk of death or damage ards numerator	e areas ject to minent volca- re
G. Social G6 Safety G6.3 Population livit Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes and Indicator Percentage of inhabitants living in a zone subject to natural hazards Assessment Methodolog 1. Calculate the total num areas subject to significar caused by prominent haz (A) - 2. Calculate total number	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur % y: hber of city inhabitants livit trisk of death or damage ards numerator	e areas ject to minent volca- re
G. Social G6 Safety G6.3 Population livit Intent: To assess p opulation significant risk of death or hazards: cyclones, drough noes an Indicator Percentage of inhabitants living in a zone subject to natural hazards Assessment Methodolog 1. Calculate the total num areas subject to significan caused by prominent haz (A) - 2. Calculate the value of 3. Calculate the value of	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur % y: nber of city inhabitants living trisk of death or damage ards numerator of city inhabitants enominator	e areas ject to minent volca- re
G. Social G6 Safety G6.3 Population live Intent: To assess p opulati significant risk of death or hazards: cyclones, drough noes an Indicator Percentage of inhabitants living in a zone subject to natural hazards Assessment Methodolog 1. Calculate the total num areas subject to significan caused by prominent haz (A) - 2. Calculate total number (B) - d 3. Calculate the value of	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur % v v v v v v v v v v v v v v v v v v	e areas ject to minent volca- 'e
G. Social G6 Safety G6.3 Population livi Intent: To assess p opulation significant risk of death or hazards: cyclones, drough noes and Indicator Percentage of inhabitants living in a zone subject to natural hazards Assessment Methodolog 1. Calculate the total num areas subject to significan caused by prominent haz (A) - 2. Calculate total number (B) - d 3. Calculate the value of Standard:	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur % vit risk of death or damage ards numerator of city inhabitants livit trisk of death or damage ards numerator the indicator as v/B (%)	e areas ject to minent volca- 'e
G. Social G6 Safety G6.3 Population livi Intent: To assess p opulation isignificant risk of death or hazards: cyclones, drough noes an Indicator Percentage of inhabitants living in a zone subject to natural hazards Assessment Methodolog 1. Calculate the total num areas subject to significan caused by prominent haz (A) - 2. Calculate total number (B) - d 3. Calculate the value of	ing in disaster prone on living in areas sub damage caused by pro t, floods, earthquakes, d landslides Unit of Measur % Unit of Measur % y: nber of city inhabitants livit trisk of death or damage ards numerator to f city inhabitants enominator the indicator as \/B (%) Reference: UNECE - Collection Metho for Key Performance Indic	e areas ject to minent volca- 'e ng in





SCTool MED

SCTool

SCTool



Description of the Information

H: Issue.

Hx: Category.

- H1: Economic performance.
- H2: Employment.
- H3: Innovation.
- H4: ICT infrastructure.

Hx.x: Criterion.

Intent: Description of the objective of the criterion.

Indicator: Name of the indicator to be calculated.

Unit of Measure: Measuring unit of each indicator.

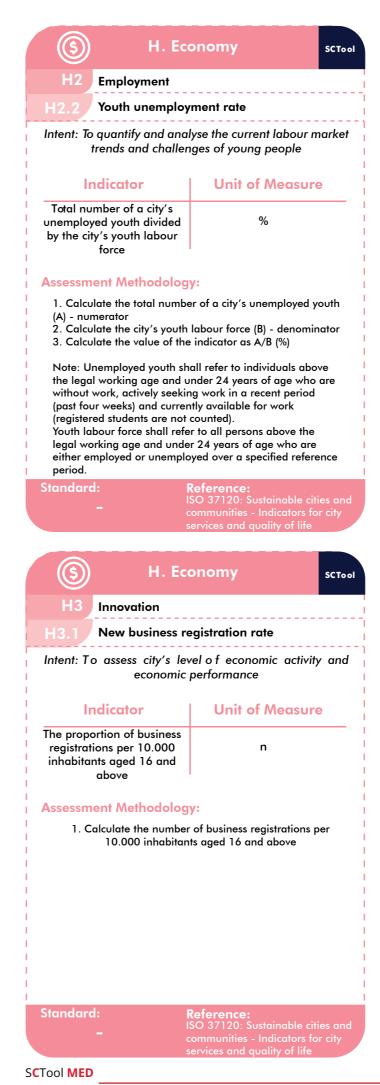
Standard: The calculation standard for the criterion.

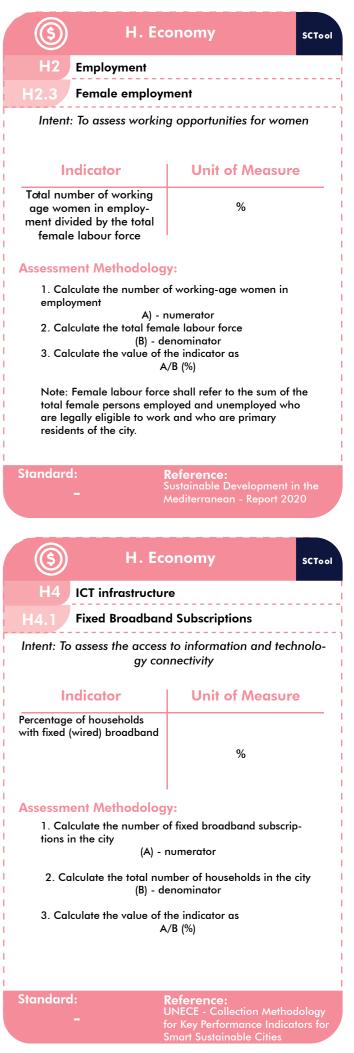
References: The acquiring source of information.

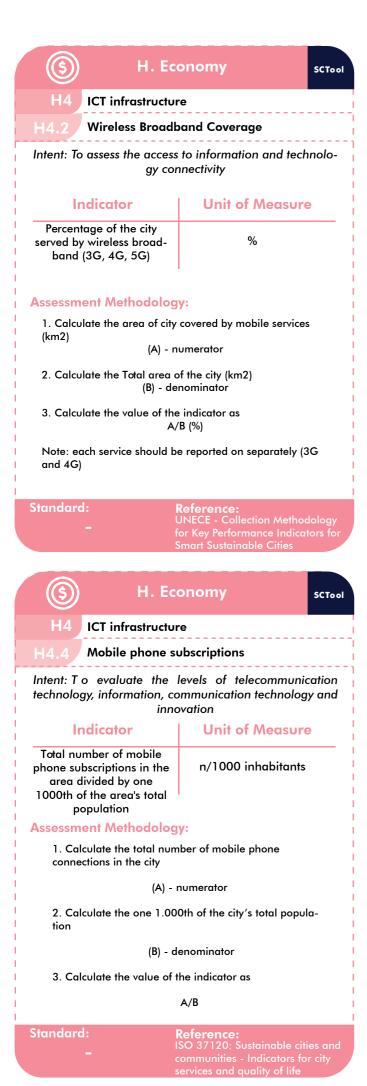
★ Key Performance Indicator

S H. Economy		SCTool	
H1 Economic performance H1.2 Economic contribution from tourism activity			
Intent: To assess the evolution of the tourist frequency			
Indicator	Unit of Measure	9	
Sum of overnight visitor stays divided by the city's total population	stays/resident		
Assessment Methodology: 1. Calculate the sum of overnight visitor stays in the city			
(A) - numerator			
2. Calculate the city's total population			
(B) - denominator			
3. Calculate the value of the indicator as			
	A/B		
_ (Reference: CESBA MED Project – SNToo assessment system	ol	

(H. Ec	onomy	SCTool	
H1	H1 Economic performance			
H1.1	H1.1 Average annual per-capita income of residents			
Inte	ent: To evaluate th	e economic well-being		
	ndicator	Unit of Measur	e 1	
of resid relative	er-capita income ents in the city to that of the gion as a whole	%		
	ent Methodolog	-		
city		a income of residents in th numerator		
2. Cal	culate the per-capite	a income of the whole urb	an I	
region		enominator		
3. Cal	culate the value of t A	he indicator as /B (%)	i I	
1				
Ctown drawn			1	
Standard	_ (Reference: CESBA MED Project – SNTc issessment system	ool	
	H. Ec	onomy	SCTool	
H2 Employment				
H2.1	Unemployment	rate		
		r market status, the eco citizens' quality of life	onomy	
l Ir	ndicator	Unit of Measur	e I	
primary res employment ment, but o	er of working-age sidents not in paid nt or self-employ- available for work g work divided by bour force	%		
Assessment Methodology: 1. Calculate the number of working-age primary residents who during the survey reference period were not in paid employment or self-employment, but available for work and seeking work (A) - numerator 2. Calculate the total labour force (B) - denominator 3. Calculate the value of the indicator as A/B (%)				
Note: Unemployment shall refer to individuals without work, actively seeking work in a recent period (past four weeks) and currently available for work. Labour force shall refer to the sum of the total persons employed and unemployed who are legally eligible to work and who are primary residents of the city.				
Standard	_	Reference: CESBA MED Project – SNTc Issessment system	bol	
		SC1	Tool MED	







(5) H. E	conomy	SCTool		
H4 ICT infrastructure				
H4.3 Availability of	WIFI in Public Areas			
Intent: To increase access to internet at little or no cost				
		1		
Indicator	Unit of Measure) 		
Number of public WIFI hotspots in the city per 1000 inhabitants	n/1000 inhabitants	I I I		
Assessment Methodology:				
1. Calculate the total number of WIFI hotspots provided by the city administration				
(A) - numerator				
2. Calculate the one 1.000 of the city's total population				
(B) - denominator				
3. Calculate the value o	f the indicator as	1		
A/B				
		I		
Standard: –	Reference: UNECE - Collection Method for Key Performance Indica Smart Sustainable Cities	dology tors for		



I. Climate change: mitigation and adaptation

Description of the Information I: Issue. Ix: Category. **<u>I1: Climate change mitigation.</u>** 12: Adaptation to the climatic action: heatwaves and increase of temperature. 13: Adaptation to the climatic action: pluvial flood. 14: Adaptation to the climatic action: fluvial and coast flood. 15: Adaptation to the climatic action: drought . 16: Adaptation to the climatic hazard: wildfire . X.X Criterion. Intent: Description of the objective of the criterion. Indicator: Name of the indicator to be calculated. Unit of Measure: Measuring unit of each

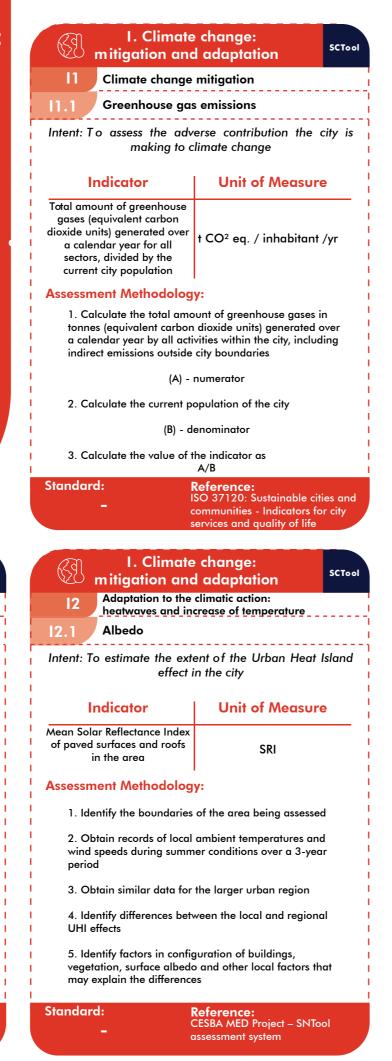
indicator.

Standard: The calculation standard for the criterion.

References: The acquiring source of information.

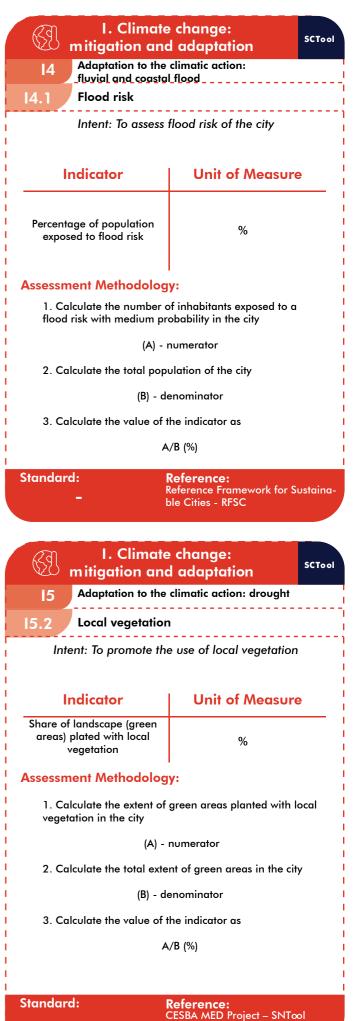
★ Key Performance Indicator

I. Climate mitigation and		SCTool	
I1 Climate change mitigation			
[1.2 CO ² sequestration			
Intent: To promote the C	O ² sequestration in the	city	
Indicator	Unit of Measure	9	
Potential CO2 sequestration in the city per he	tepCO²/he		
Assessment Methodolog	y:		
 Calculate the amount a city 	of CO2 sequestration in the	•	
(A) - r	numerator		
2. Calculate the area of the	ne city (he)		
(B) - de	enominator		
Calculate the value of t	he indicator as		
	A/B		
	Reference: CESBA Alps project		



নে I. Climate	change	
mitigation and		SCTool
Adaptation to the pluvial flood	climatic action:	
★ 13.1 Permeability of		
	permeability of the area	 ז
	, ,	
Indicator	Unit of Measure	•
Percentage of weighted ground permeability	%	
Assessment Methodolog	•	
green areas, surfaces pav	nstructions in the city area (
	Reference: CESBA MED Project – SNTo assessment system	ol
I. Climate	change:	
I. Climate mitigation and		SCTool
Mitigation and Adaptation to the	d adaptation climatic action: drought	
Mitigation and Adaptation to the	d adaptation climatic action: drought on and storage from build	
Mitigation and IS Adaptation to the Rainwater collection for non-potable u	d adaptation climatic action: drought on and storage from build	lings
Mitigation and IS Adaptation to the Rainwater collection for non-potable u	d adaptation climatic action: drought on and storage from build ses	lings se
Mitigation and IS Adaptation to the Rainwater collection for non-potable of Intent: To promote rain	d adaptation climatic action: drought on and storage from build ses water collection for re-u	lings se
Imitigation and I5 Adaptation to the Rainwater collecting I5.1 Adaptation to the Rainwater collecting for non-potable u Intent: To promote rain Indicator Share of buildings in the city with a rainwater collection	d adaptation climatic action: drought on and storage from build ses water collection for re-u Unit of Measure %	lings se
Imitigation and I5 Adaptation to the I5.1 Rainwater collecting I5.1 for non-potable of Intent: To promote rain Indicator Share of buildings in the city with a rainwater collection system Assessment Methodology	climatic action: drought on and storage from build ses water collection for re-u Unit of Measure % y: of buildings in the city with	lings se
Imitigation and IS Adaptation to the Rainwater collecting IS.1 Adaptation to the Rainwater collecting for non-potable under the collection Intent: To promote rain Indicator Indicator Indicator Share of buildings in the city with a rainwater collection system Assessment Methodology 1. Calculate the number of rainwater collection system	climatic action: drought on and storage from build ses water collection for re-u Unit of Measure % y: of buildings in the city with	lings se
Imitigation and IS Adaptation to the Intent: To promote rain Intent Indicator Indicator Share of buildings in the city with a rainwater collection system State of the number of aniwater collection system Assessment Methodology 1. Calculate the number of aniwater collection system	climatic action: drought on and storage from build ses water collection for re-u Unit of Measure % y: of buildings in the city with n	lings se
Imitigation and IS Adaptation to the Rainwater collection for non-potable under Intent: To promote rain Intent: To promote rain Indicator Share of buildings in the city with a rainwater collection system Assessment Methodology 1. Calculate the number of rainwater collection system (A) - 1 2. Calculate the total number	climatic action: drought on and storage from build ses water collection for re-u. Unit of Measure % y: of buildings in the city with m	lings se
Imitigation and IS Adaptation to the Rainwater collection for non-potable under Intent: To promote rain Intent: To promote rain Indicator Share of buildings in the city with a rainwater collection system Assessment Methodology 1. Calculate the number of rainwater collection system (A) - 1 2. Calculate the total number	climatic action: drought on and storage from build ses water collection for re-u. Unit of Measure % y: of buildings in the city with n numerator aber of buildings in the city enominator	lings se
Mitigation and 15 Adaptation to the Rainwater collection for non-potable of for non-potable of Intent: To promote rainwater collection system Intent: To promote rainwater collection for non-potable of Intent: To promote rainwater collection system Share of buildings in the city with a rainwater collection system Assessment Methodolog 1. Calculate the number of rainwater collection system (A) - for the collection system 2. Calculate the total numer of the collection system (B) - do 3. Calculate the value of the system	climatic action: drought on and storage from build ses water collection for re-u. Unit of Measure % y: of buildings in the city with n numerator aber of buildings in the city enominator	lings se
Mitigation and 15 Adaptation to the Rainwater collection for non-potable of for non-potable of Intent: To promote rainwater collection system Intent: To promote rainwater collection for non-potable of Intent: To promote rainwater collection system Share of buildings in the city with a rainwater collection system Assessment Methodolog 1. Calculate the number of rainwater collection system (A) - n 2. Calculate the total num (B) - de 3. Calculate the value of	climatic action: drought on and storage from build ses water collection for re-u. Unit of Measure % y: of buildings in the city with n numerator aber of buildings in the city enominator the indicator as	lings se

SCTool MED



assessment system

I. Climate mitigation and		SCTool	
Adaptation to the climatic hazard: wildfire			
16.1 Wildfire risk			
Intent: To assess wildfire risk of the city			
Indicator	Unit of Measure	9	
Percentage of population exposed to wildfire risk	%		
Assessment Methodolog	y:		
 Calculate the amount of wildfire risk in the city 	of population exposed to		
(A) - numerator			
2. Calculate the total population of the city			
(B) - d	enominator		
3. Calculate the value of	the indicator as		
A/B (%)			
Standard:	Reference:		
- A second se Second second s second second sec			



Description of the Information Issue. Jx :Category.

J1: Urban Planning.

J2: Management and community involvement

J3: Public buildings operation.

Jx.x Criterion.

Intent: Description of the objective of the criterion.

Indicator: Name of the indicator to be calculated.

Unit of Measure: Measuring unit of each indicator.

Standard: The calculation standard for the criterion.

References: The acquiring source of information.

★ Key Performance Indicator

J. Governance		SCTool	
J2 Management and community involvement J2.1 Involvement of residents in community affairs			
Intent: To promote involvement of citizens in community affairs			
Indicator	Unit of Measure	e i	
Percentage of resident population above 16 years having an involvement in community affairs			
Assessment Methodology:			
 Calculate the amount of resident population above years having an involvement in community affairs 			
(A) - numerator			
 Calculate the total population above 16 years of the city 			
(B) - denominator			
3. Calculate the value of t	he indicator as		
	/B (%)		
	Reference: CESBA MED Project – SNTo Issessment system	ol	

m	J. Gove	ernance	SCTool	
J1 Urban Planning Community involvement in urban planning activities				
Intent: To raise the level of community involvement in planning through the redistribution of power				
h	ndicator	Unit of Measure	•	
	e of residents active c urban planning	Level		
Assessm	ent Methodolog	y:		
		ladder on citizen participa s' involvement on planning		
	E -1 (LEVEL 1) Non-p nerapy (in the Arnste	participation or manipulation in ladder).	on	
SCORE 0 (LEVEL 2) Degrees of tokenism: Information / Consultation / Placation (in the Arnstein ladder).			ı /	
SCORE 3 (LEVEL 3) Degrees of citizen power: Partners- hip, delegated power and citizen power (in the Arnstein ladder) in one phase, like diagnosis or after delivery.			ein	
SCORE 5 (LEVEL 4) Degrees of citizen power: Partners- hip, delegated power and citizen power (in the Arnstein ladder), at every stages.				
Standard Sherry A	rnstein	Reference: CESBA MED Project – SNToo Issessment system)	

Î	J. Gove	ernance	SCTool
J3	Public buildings	operation	
J3.1	J3.1 Public buildings sustainability		
Intent: To evaluate the number of buildings with a certifi- cation label			
lı	ndicator	Unit of Measure	•
Percentage area of public buildings with recognized sustainability certifications for ongoing operations			
Assessment Methodology:			
 Calculate the floor area of public buildings with certification to a recognized standard for ongoing building operation (m²) 			
(A) - numerator			
2. Calculate the total floor area of public buildings (m ²)			n²)
1	(B) - denominator		
3. Ca	lculate the value of t	he indicator as	
	A	/B (%)	
Standard		Reference: JNECE - Collection Method	lology

Ш J. Governance SCTool **J3** Public buildings operation Operating energy costs for public buildings **J3.2** Intent: To evaluate the operational energy costs amount for public buildings Unit of Measure Indicator Aggregated annual operating energy cost per aggre-€/m²/yr gated indoor useful floor area Assessment Methodology: 1. Calculate the aggregated annual operating energy cost per aggregated indoor useful floor area (m²) Reference: CESBA MED Project – SNTcol Standard: assessment system ĪIII J. Governance SCTool **J4** Equity Women elected to city level office J4.1 _ _ _ _ _ _ Intent: To assess the opportunity in labour for leading positions of women Indicator Unit of Measure Total number of elected city-level positions held by % women divided by the total number of elected city-level positions Assessment Methodology: 1. Calculate the total number of elected city-level positions held by women (A) - numerator 2. Calculate the total number of elected city-level positions (B) - denominator 3. Calculate the value of the indicator as

I	A/B (%)
Standard: -	Reference: ISO 37120: Sustainable cities ar communities - Indicators for city services and quality of life

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for Key Performance Indicators for Smart Sustainable Cities

m	J. Gove	ernance	SCTool		
J3	Public buildings	operation			
J3.3	Energy consun	nption of public build	lings		
Intent: 1		energy efficiency of µ Idings	public		
Ir	ndicator	Unit of Measure	; ;		
Total end public bui divided by area of	kWh/m²				
Assessm	ent Methodolog	y:			
	lculate the total end ngs within the city (k	use of energy in public Wh)			
	(A) - I	numerator			
 Calculate the total indoor useful area of these buildings (m²) 					
(B) - denominator					
3. Calculate the value of the indicator as					
	A/B				
Standaro -	Ċ	Reference: CESBA MED Project – SNTo Issessment system	ol		

4.Key performance indicators



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- B. Energy: 2
- C. Water: 1
- D. Solid waste: 1
- E. Environmental quality: 1
- G. Social aspects: 0
- H. Economy: 0
- J. Governance: 0



KPIs are a set of assessment criteria that during the contextualisation process must be included in the local versions of the

There are 10 key performance indicators :

A. Use of land and biodiversity: 1

```
F. Transportation and mobility: 2
I. Climate change: mitigation and adaptation: 2
```

A. Use of land and b	iodiversity	SCTool	В.
A2 Green urban areas		B2	Energy Consumptions
A2.1 Availability of Green Urban Areas		★B2.1	Final energy consumption
Intent: To facilitate climate change adaptation c of life, favoring biodiv		ality	Intent: To estimate the final ene
Indicator	Unit of Measure		Indicator
Proportion of all vegetated areas within the city boundaries in relation to the total area	%		Total final energy consumed by city divided by the total populatic of the city
Assessment Methodology:		Ass	essment Methodology:
 Calculate total amount of Green Urban Areas (A) - nume 		1. Co	Ilculate the final energy consumption fo
2. Calculate the total area of the city			(A) -
, (B) - denom	inator	2. Co	Ilculate the total population of the city
3. Calculate the value of the indicator as			(B) - d
A/B (%	5)	3. Co	Ilculate the value of the indicator as
	1		
Note: A Green Urban Area is defined as an urb for instance natural zones, parks, public and priv		kind,	
Standard: Refe			
	e rence: A – Calculation Guideline		itandard: R
			_ is
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B. Energy

nate the final energy consumption for all energy sectors.

Unit of Measure

MWh/inhabitant/yr

y consumption for all energy sectors in MWh

(A) - numerator

(B) - denominator

A/B

Reference: ISO 37120: Sustainable cities and communities -Indicators for city services and quality of life

	B. Ene	rgy	SCTool			C. \
^{B3} Renewable energy				C2	Water consump	tion
3.1 Final energy derived f				★ C2. 1	Total water consu	nption
Intent: To incentive t	he consumption an	nd production of renewable energy				Intent: To evaluate w
Indicate	or	Unit of Measure				ndicator
Share of renewable e energy der		%			consumption div	the city's daily water vided by the total city pulation
Assessment Methodolog	gy:			Asso	essment Methodol	ogy:
 Calculate the total consur for all energy sectors MWh 	nption of end-use	energy generated from renewable so	ources	1. C	alculate the total am	ount of the city's wo
	(A) - num	erator				(A) - nu
. Calculate the total final en	ergy demand MW	h		2. C	alculate the total city	
	(B) - denon			3. C	alculate the value of	(B) - der the indicator as
3. Calculate the value of the				Note	e: the scope of the in	dicator includes the
	A/B (%	6)		- Ba - Wa - Ga - Co - Inc	inking thing ushing ordening ommercial dustrial ricultural	
Standard: -	Refere CESBA /	e nce: MED Project - SNTool Assessment Sys	stem.	Sta	ndard: -	Ref ISO Indi
00			SCTool MED	SCTool M	ED	

Reference: ISO 37120: Sustainable cities and communities -Indicators for city services and quality of life

Intent: To evaluate water resources in the city

Unit of Measure

L/day/person

otal amount of the city's water consumption in litres per day

(A) - numerator

(B) - denominator

A/B

f the indicator includes the use of potable water for:

+	D. Solid	waste SCT001
D2	Solid waste management	
D2.2	Solid waste recycling	
	Intent: To improve separate collectic	
	Unit of Measure	
	Total amount of solid waste that is recycled divided by the total amount of solid waste produced in the city	%
Asse	essment Methodology:	
1. C	alculate the total amount of the city's solid	waste that is recycled in tonnes
	(A) - num	
2. C	alculate the total amount of solid waste pro	oduced in the city in tonnes in the city
	(B) - denor	ninator
3. C	alculate the value of the indicator as	
	А/В (
Note vere tions	d and processed into new products follow	terials diverted from the waste stream, reco- ving local government permits and regula-
Sta	UNEC	r ence: E - Collection Methodology for Key Perfor- e Indicators for Smart Sustainable Cities

	E. Environmen	tal quality
E1	Air quality	
≣1. 1	Fine particulate matter (PM2.5) concentr	ation
	Intent: To evaluate the quality of daily limits of pol	-
	Indicator	Unit of Measure
	Annual average fine particulate matter (PM2.5) concentration	μg/m³
Asse	ssment Methodology:	
1. Co	llect the annual mean of PM2.5 concentra	
1. Co monit 2. Ca		ries
1. Co monit 2. Ca	llect the annual mean of PM2.5 concentration installed in the city's boundation locate of the values collected	ries n the previous step as the sum of the an
1. Co monit 2. Ca mean	llect the annual mean of PM2.5 concentra- toring station installed in the city's bounda lculate the average of the values collected n PM2.5 concentration values	ries n the previous step as the sum of the an
1. Co monit 2. Ca mean	llect the annual mean of PM2.5 concentration toring station installed in the city's bounda lculate the average of the values collected n PM2.5 concentration values (A) - num	ries n the previous step as the sum of the an erator

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Standard:

F. Transportation	n and mobility scro	
F1 Performance of mobility services		F2 Green
(F1. 1 Public transport network		★F2. 4 Bicycle
Intent: To assess city's transpo	ortation network availability	
Indicator	Unit of Measure	
Length of public transport system per 1000 population	km/1000 inhabitants	Total divid
Assessment Methodology:		Assessment
 Calculate the total length (in kilometres) of the city 	he public transport systems operating within	1. Calculate t
(A) - num	nerator	
2. Calculate the one 1.000th of the city's total	population	2. Estimate/C
(B) - denor	minator	
3. Calculate the value of the indicator as		3. Calculate t
A/B	3	
ISO 37	rence: 7120: Sustainable cities and communities - tors for city services and quality of life	Standard:
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6	F. Transportation	n and mobility
F2	Green mobility	
F2. 4	Bicycle network	
	Intent: To emphasise the use of bio congestion a	,
	Indicator	Unit of Me
	Total length of bicycle paths and lanes divided by the city's total population	m/inhab
Asse	ssment Methodology:	
1. Co	lculate total length of bicycle paths/lanes	in the city
	(A) - num	erator
2. Est	imate/Calculate the total city's population	ı
	(B) - denor	minator
3. Co	lculate the value of the indicator as	
	A/I	В

reduce traffic

easure

bitant

Reference:

UNECE - Collection Methodology for Key Performance Indicators for Smart Sustainable Cities

11 Climate change mitigation		
1 Greenhouse gas emissions		
Intent: To assess the adverse contribution	n the city is making to climate change.	
Indicator	Unit of Measure	
Total amount of greenhouse gases (equivalent carbon dioxide units) gene- rated over a calendar year for all sectors, divided by the current city population	t CO² eq. / inhabitant /yr	
Assessment Methodology:		
. Calculate the total amount of greenhouse ga nits) generated over a calendar year by all act missions outside city boundaries		
(A) - num	erator	
. Calculate the current population of the city		
(B) - denor . Calculate the value of the indicator as	ninator	
A/B		
Standard: Refer	ence:	
	120: Sustainable cities and communities -	

I. Climate change: mitigation

Adaptation to the climatic action:

Permeability of land

Intent: To improve the p

Indicator

Percentage of weighted ground permeability

ssessment Methodology:

Calculate the size (Sa) of the city area (m²)

Calculate the size of the surfaces with a diffe e city area (i.e. green areas, surfaces paved c.). Include all the surfaces in the city area so

= total surface of the city area i,i = surface i-th in the city area (m²)

Calculate the real permeability of soil consid rface.

i, i = i-th surface in the city area (m²) = permeability coefficient of the i-th surface

Calculate the indicator's value as:

ote:

Standard: -	Refer CESBA
Channel and	
- Concrete gratings leaning on the grass = 0,6	- Asp
 Plastic gratings filled with land/grass = 0,8 	- Cor
- Sand = 0,9	- Inte
- Gravel = 0,9	- Inte
- Grass = 1	- Inte
Reference permeability coefficients:	Conc

on and adaptation	SCTool
pluvial flood	
permeability of the area	
	1
Unit of Measure	
%	
erent paving or occupied by constructions with asphalt, surfaces occupied by building o that:	
dering the permeability coefficient of each	
ncrete gratings leaning on gravel = 0,6 terlocking elements leaning on sand = 0,3	
terlocking elements leaning on gravel = 0,3 terlocking elements leaning on concrete pavemen ontinuous pavements leaning on concrete = 0	t = 0
sphalt = 0	
rence: A MED Project - SNTool Assessment Syste	m

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5.SMC passport

Sustainable MED cities passport



Definition:

different pages. tures of the analysis. unit of measure and value.

Observation:



The Passport template is a graphical visualisation of the main information concerning the assessment and it includes two

The first one contains general information as well as maps and significant images, in order to better represent the fea-

The second page of the Passport contains the list of the Key Performance Indicators, together with their code, criterion,

The sustainability score produced by SMC rating system is valid only for the specific geographical area, as it reflects the local priorities and construction practice.

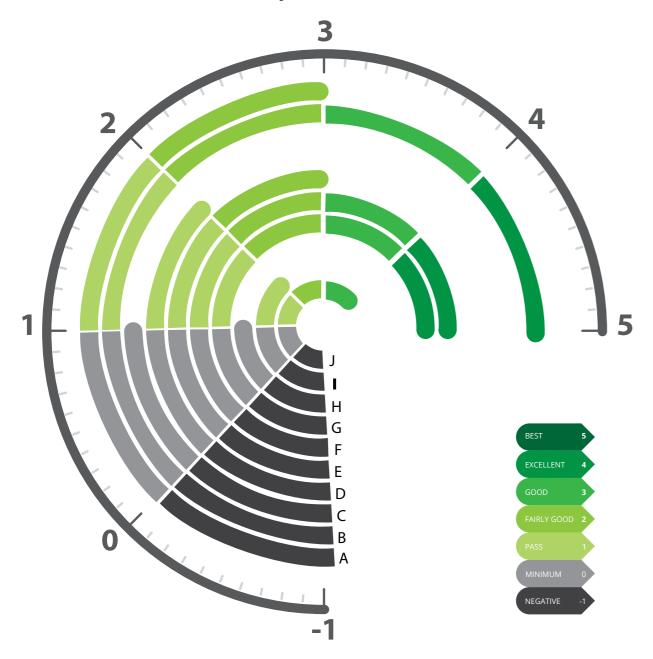
In order to be able to compare the sustainability performance between buildings, neighborhoods or cities in the different Mediterranean regions, it is necessary to use indicators expressed in absolute values instead of scores.

SMC Key Performance Indicators Name of the Pilot City **SMC Passport City** Short Description CODE Name: CRITERIA Availability of green urban areas Total amount A2.1 Total area (km2): in the city's bo total area of th Country: Total final ener Final energy consumption B2.1 City: vided by the to -----1 1 . . Final energy derived from renew-Share of renew B3.1 able sources energy demar IMAGE MAP Total water consumption Total amount C2.1 1.1 consumption population ----Climate Demography Solid waste recycling Total amount PopulationInhab | Annual precipitationmm D2.2 cled divided by waste producekWh/m²y Urban residential density Solar irradiance on horizontalInhab/haPersons Winter / summer design Population working in the area°C temperature Particulate matter (PM10) concen-Annual averag E1.2 (PM10) concer tration Other info Heating degree days (base 18°C)HDD Use of land and morphology Public transport network Length of pub **Building Stock** F1.1 1000 population Number of buildings in the area Percentage of consumed land area%number Gross area of residential Buildingsm² Total lenght of urban streets withkm Total length of Bicycle network F2.4 sidewalks divided by the Gross area office buildingsm² Total lenght of bicycles lanesm Gross area of retail/ Commercialm² buildings Other relevant info Greenhouse gas emissions Total amount 11.1 (equivalent ca Total gross area of all buildingsm² ated over a ca divided by the Total gross area of buildingsm² constructed before 1975 Permeability of land Percentage of 13.1 ability. Average building density (total m2/number land surface in m2)



	Sustainable	MED Cities
INDICATOR	VALUE	UNIT
of green urban areas oundaries divided by the he city		%
ergy consumed by a city di- otal population of the city		MWh/inhabi- tant/yr
wable energies in final nd		%
of the city's daily water divided by the total city		L/day/person
of solid waste that is recy- by the total amount of solid red in the city		%
ge fine particulate matter ntration		µg∕m³
olic transport system per ion		km/1000 inhab- itants
of bicycle paths and lanes e city's total population		m/inhabitant
of greenhouse gases arbon dioxide units) gener- alendar year for all sectors, e current city population		t CO _{2 eq} /inhabi- tant/yr
f weighted ground perme-		%
		111

Visualisation of the sustainability assessment results





	Score	Weight	t
A Use of land and biodiversity	3,1	11,2%	0,34
B Energy	5	27%	1,35
C Water	1,1	20%	0,22
D Solid Waste	2,2	2,7%	0,05
E Environmental quality	3,2	10,5%	0,33
F Transportation and mobility	5	10%	0,5
G Social Aspects	5	4,4%	0,22
H Economy	1,1	2%	0,02
I Climate Change: mitigation and adaptation	ר 2,4	8,6%	0,2
J Governance	4,2	3,6%	0,15
		100%	3,38
			SCTool MED

Sustainability Assessmet Results

sustainability.

The Certificate template is a graphic label which allows, in a visual way, to understand the sustainability performance obtained by the neighbourhood.

The document summarises the scores achieved in each issue of the assessment system, giving the final score of the

Scores are then illustrated using a tachometer with a gradu-ated scale which goes from the -1 (negative performance) to the 5 points (best performance).

6.References



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Sustainable Cities Tool



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