# **SNTool**<br/> **MED**

Sustainable Neighbourhood Tool

Integrated tool and assessment methodology for sustainable neighbourhoods in MED cities

Version : 2023-A





### TABLE OF CONTENTS

Introduction
1. SBE method
1.1 Hierarchy levels 1.1 Assessment process
2. Contextualization
2.1 Selection of the active cri 2.2 Benchmarking 2.3 Weighting
3. Sustainable Neighbourho
4. Key performance indicato
5. SMC Passport
6. References

Sustainable MED Cities - Integrated Tools and Methodologies for Sustainable Mediterranean Cities, is a capitalization project whose main objective is to enhance the capacity of public administration in delivering, implementing and monitoring efficient measures, plans and strategies to improve the sustainability of cities, neighbourhoods and buildings.

This project received funding from the European Union's ENI CBC MED Programme under Grant Contract C\_B.4.3\_0063.

Content of the Booklet:

Editor: Andrea Moro (iiSBE Italia R&D), Elena Bazzan (iiSBE Italia R&D), Constantinos A. Balaras (NOA), Popi Droutsa (NOA).

Editing and layout: Luis Alonso, Valentina Restrepo Rojas, ESDesigner - iiSBE Italia R&D

All rights reserved.

The document reflects the views of the authors. The ENI CBC MED Programme is not responsible for the use that may be made of the information contained therein.

••••••	5
	6
•••••••	8 14
	30
iteria	32 36
•••••••••••••••••••••••••••••••••••••••	40
od Tool	46
ors	106
	122
•••••	128

# Sustainability assessment method for the neighbourhoods built environment



SNTool MED is an assessment system for measuring the sustainability of neighbourhoods and small urban areas. It is a tool useful to support decision making processes for the development, implementation and monitoring of urban plans and action plans for more sustainable cities. SNTool can be contextualized and adapted to any Mediterranean region. SNTool is based on a transnational common methodology, the SBE Method.

SBE Method has been developed by iiSBE (international initiative for a Sustainable Built Environment) through the Green Building Challenge (GBC), an international research initiative launched in 1996. Over time, more than 25 countries from all the continents contributed to the development of SBE Method and the test of the assessment tools based it.

SBE Method implements the "think globally, act locally" concept, acting as a common "language" for assessing the sustainability of the built environment. An assessment tool based on the SBE Method, such as SNTool, can be adapted to any context reflecting local priorities and peculiarities. The use of SNTool allows to evaluate, compare and aggregate the results of sustainability measures deployed in different cities (act locally) and, at the same time, to evaluate the progress towards the global sustainability targets (think globally), avoiding the uncertainty and confusion generated using different assessment tools and methodologies. Any city can develop its own version of SNTool that will provide sustainability assessment results comparable and aggregable with the ones of other Mediterranean cities.

The first version of SNTool has been developed through the Interreg MED project "CESBA MED: Sustainable Cities", leaded by the City of Torino with the scientific coordination of iiSBE Italia R&D. The other partners of the project were: Government of Catalonia, National Observatory of Athens, AURA-EE, EnvirobatBDM, City of Udine, City of Sant Cugat del Vallés, University of Malta, Energy Institute Hrvoje Požar, CESBA. In the Sustainable MED Cities project, SNTool has been further upgraded and upscaled to be applicable to the whole Mediterranean region, taking in account the specific issues of the South and East shores, with the contribution of Greater Irbid Municipality, Municipality of Sousse, Municipality of Moukhtara, UNEP/MAP and MedCities.

This publication illustrates the SBE Method, how to contextualise SNTool 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 neighbourhoods is also explained.

SNTool MED is freely available to any municipality in the Mediterranean willing to develop its own sustainability assessment tool at neighbourhood scale. The use of SNTool contributes to the achievement of the objectives of the Mediterranean Strategy for Sustainable Development, raising the capacity to act of municipalities.

Andrea Moro

WP3 Coordinator iiSBE Italia R&D

SNTool MED

# **1. SBE Method**

Sustainable Built Environment Method



sustainability.

Main elements:

1. A set of assessment criteria. criterion. 3. A normalization method. 4. An aggregation method.



SNTool 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 neighbourhood's overall

2. A set of indicators, which allow to quantify the neighbourhood's performances with respect to each

hierarchic levels:

- 1. Issues 2. Categories 3. Criteria
- 4. Indicators

# **1.1 Hierarchic levels**

The multicriteria analysis method is structured in four

### Categories Issues Describe general themes, recognized as relevant for assessing the sustainability of a neighbourhood. For instance, the issues of SNTool are: A.1 Use of land 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-(45 B - Energy G - Social Aspects tions



C - Water





E Environmental quality



I - Climate Change: mitigation and adaptation



- Governance



impacts

8

A S

Concern particular aspects of issues. For instance, in the SNTool, 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 mobility service

F.2 Green mobility

F.3 Safety in mobility

F.4 Urban morphology and transporta-

G.3 Availability of public and private facilities and services



G.5 Social inclusion

G.8 Food security

G.9 Cultural Heritage

-G.10 Perceptual

-H.2 Employment

-H.3 Innovation

H.4 ICT infrastructure

-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

I.7 Adapatation to - the climatic hazard: Wind

\_J.1 Urban planning

J.2 Management and community involvement

J.3 Public buildings cooperation





Definition and objective:

1. Characterization

Calculation/evaluation of the indicators' value.

2. Normalisation

Assignement 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

SNTool MED

The main goal of the SBEMethod is to provide a final concise score, which summarizes the overall performance of the neighbourhood with respect to all criteria.

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: Characterization**

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

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

For the qualitative indicators, the performance of the neighbourhood is assessed thorough the selection of a reference scenario.

Examp	ble:			
Code	Criterion	Indicator	Unit of measurement	Value
A1.3	Homogeneity of the urban fabric.	Percentage of the perimeter of the area directly adjacent to urbanized areas	%	78
B2.2	Total final thermal energy consumption for building operations.	Aggregated annual final thermal energy consumption of residential buildings per aggregated internal useful floor area.	/ kWh/m²/ er yr	180
C3.2	Public wastewater that is disposed or treated.	Percent of public wastewater that is disposed or treated.	%	78
D1.1	Availability of solid waste collection.	Percentage of buildings with regular solid waste collection.	%	70
E2.1	Ambient daytime noise conditions.	Percentage of building area over noise limit.	%	23
F1.1	Performance of the public transport system.	Percentage of inhabitants that are within 400 meters walking distance of a least one public transportation service stop.	it %	80
G1.3	Barrier-free accessibility in local outdoor public areas.	Adequacy of barrier-free accessible public outdoor areas compared to the total public area.	D- %	47
H4.2	Wireless Broadband Cov- erage.	Percentage of the neighborhood area served by wireless broadband (3G 4G, 5G).	%	56
12.3	Green roofs.	Aggregate area of building roofs covered with vegetated material.	%	1
J1.1	Community involvement in urban planning activities	Percentage of residents active in public urban planning	Level	3

# **Step 2: Normalisation**

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 a defined on the base of
1	The score corresponds resents a minimum incl the minimum acceptab
2	The score corresponds resents a substantial in minimum acceptable p
3	The score corresponds resents a best practice.
4	The score corresponds resents an improvemer
5	The score corresponds resents an excellent an

Scoring scale:

16

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 normalized 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:

B3.7 - Share of renewable energy on-site, relative to total primary energy consumption for building operations.

### Indicator:

Total consumption of primary energy generated from renewable sources on-site divided by total primary energy consumption.

Value of the indicator: 45% 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:

I1.2 - Greenhouse gas emissions from residential buildings

### Indicator:

Total amount of greenhouse gases in Kg (equivalent carbon dioxide units) generated over a calendar year per aggregated indoor useful floor area

Value of the indicator: 27 Kg CO2 eq / m<sup>2</sup> Normalised score: 2.7

SNTool MED



### 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: Management & Community Involvement Normalisation of the indicator's value: 3 corresponding to the scenario "Degrees of citizen power: Partnership, delegated power and citizen power in one phase, like diagnosis or after delivery" Scer S



SNTool MED

SNTool MED

21

# **Step 3: Aggregation**

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

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 neighbourhood.

In what follows are used the symbols:

a. Xi the i-th issue. The issues in SNTool 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<sub>i</sub>, j=1, ....., N<sub>c</sub><sup>(i)</sup>, where N<sub>c</sub><sup>(i)</sup> 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<sub>ii</sub>

### 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 SNTool category A1 Use of land:

Code	Criteria	Score	Weight
A1.1	Population density	3,1	24%
A1.2	Urban Compactness	2,2	34%
A1.3	Homogenity in the urban fabric	1,3	16%
A1.4	Conservation of land	0,5	26%

Calculation of the category's score as weighted sum:

Code	Criteria	Score X Weight	Weighted Score
A1.1	Population density	3,1*0,24	0,7
A1.2	Urban Compactness	2,2*0,34	0,8
A1.3	Homogenity in the urban fabric	1,3*0,16	0,2
A1.4	Conservation of land	0,5*0,26	0,1
	Score of	the category	1,8

SNTool MED

 $W_{i,j,k}$  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<sub>ij</sub>: the weight of each category included in issue Xi;

S<sub>i</sub>: 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.

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

### Example:

### Calculation of the score for the SNTool issue A **Use of land and biodiversity:**

Code	Category	Score	Weight
A1	Use of land	1,6	30%
A2	Green urban areas	2,6	30%
A3	Biodiversity and ecosystems	2,2	40%

### Through issues

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

W<sub>i</sub> = the weight of each issue included in SNTool

S<sub>i</sub> = the score of each issue included in SNTool

 $\sum = \sum_{i=1}^{N_A} w_{i,si}$ 

### Example:

### Calculation of the overall sustainability score for a **neighbourhood:**

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 issue's score as weighted sum:

Code	Category	Score X Weight	Weighted Score
A1	Use of land	1,6*0,3	0,5
A2	Green urban areas	2,6*0,3	0,8
A3	Biodiversity and ecosystems	2,2*0,4	0,9
	Total scor	re of the issue	2,2

### Calculation of the neighbourhood's overall score as a weighted sum:

Code	lssue	Score X Weight	Weighted Score
А	Use of land and biodiversity	2,2*0,08	0,2
В	Energy	1,9*1,3	0,2
С	Water	2,3*0,1	0,2
	Sustair	nability 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
3 Energy	3,1	27,0%	0,83
2 Water	3,2	20,0%	0,64
O Solid Waste.	0,9	2,7%	0,02
Environmental quality.	1,5	10,5%	0,45
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
Climate Change: mitigation and adaptation.	2,5	8,6%	0,21
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 SNTool and number of indicators selected (including KPI- key performance indicators) in the assessment.

The number available criteria	92	The number active criteria	91
is:		is:	

27

### Description of the KPIs:

Value of the Key Performance Indicators for the SMC Passport, the reporting document to compare the sustainability of Mediterranean neighbourhoods

### Example:

	KPIs neighbourhood scale	Value	Unit of measurement
B2.1	Total final thermal energy consumption for building operations	45	kWh/m²/yr
B2.4	Total final electrical energy consumption for building operations	8	kWh/m²/yr
B2.7	Total primary energy demand for building operations	60	kWh/m²/yr
B3.1	Share of renewable energy on-site in total final thermal energy consumption for building operations	30%	percentage
B3.4	Share of renewable energy on-site in total final electrical energy consumption	72%	percentage
B3.7	Share of renewable energy on-site in total primary energy consumption for building operations	72%	percentage
C2.3	Consumption of potable water in residential buildings	120	L /occupant/yr
D2.2	Access to solid waste and recycling collection points	88%	percentage
E1.2	Particulate matter (PM10) concentration	22	days/yr
F1.1	Performance of the public transport system	88%	percentage
F2.3	Bicycle network	15	m/inhabitant
G3.1	Availability and proximity of key services	75%	percentage
11.1	Greenhouse gas emissions	5	t CO <sub>2 eq</sub> ./inhabitant/y
13.3	Permeability of land	22%	percentage



# 2. Contextualization



Definition:

neighbourhood scale.

**Objectives:** 

ty issues.

The contextualisation process takes place in 3 steps:

1. Selection of criteria 2. Benchmarking

3. Weighting

SNTool MED



SNTool 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 SNTool, ready to be used for assessing the sustainability at

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

Definition:

SNTool.

selected.

**Objectives:** 

tables.

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

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

### Generic table to report the criteria selection

	ue				
AX	Name of the category	Justification			
AX.X	Name of the criterion	Text			
Example selectio	n of active criterias:				
A. Use of land and b	iodiversity		G. Social aspects		
A1	Use of land	Justification	G3	Availability of public and private facilities and services	Justification
A1.2	Urban compactness	Soil consumption is a policy priority set by the Municipality	G3.2	Availability and proximity of a pub- lic primary school	Support to sustainable mobility policies consistency with the draft revision of the general reg ulation plan (P.R.G.) of the City
B. Energy	Energy infractructure	lustification	H. Economy	Face arris or of array of a	luctification.
B. Energy B2	Energy infrastructure	Justification	H. Economy H1	Economic performance	Justification
B. Energy B2 B2.1	Energy infrastructure Total final thermal energy con- sumption for building operations	Justification Achievement of the objectives set by the Covenant of Mayors	H. Economy H1 H1.1	Economic performance Average annual per-capita income of residents	Justification Support to social and welfare policies
B. Energy B2 B2.1 D. Solid waste	Energy infrastructure Total final thermal energy con- sumption for building operations	Justification Achievement of the objectives set by the Covenant of Mayors	H. Economy H1 H1.1 I. Climate change: mitiga	Economic performance Average annual per-capita income of residents	Justification Support to social and welfare policies
B. Energy B2 B2.1 D. Solid waste D1	Energy infrastructure Total final thermal energy con- sumption for building operations	Justification Achievement of the objectives set by the Covenant of Mayors Justification	H. Economy H1 H1.1 I. Climate change: mitiga	Economic performance Average annual per-capita income of residents ation and adaptation Greenhouse gas emissions	Justification Support to social and welfare policies Justification

Definition:

selected criterion.

Objectives:

order:

1. National, regional laws

- 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

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 r	neasurment	Benchmark	Rationale	sources
AX.X	Text		Text	0 (min): number 5 (max): number	Text	Text
Example ben	chmarking					
A. Use of land	and biodiver	sity				
Use of land	A	1.2	Unit of measurment	Benchmark	Ratic	onale
A1	Urban compa	ctness	m3/m2	0 (min): 14 5 (max): 18	Technical evalua municipal offices	tion of 5
B. Energy						
Energy infrastructure	E	2.1	Unit of measurment	Benchmark	Ratic	onale
B2	Total final the consumption operations	ermal energy for building	kWh/m2 yea	0 (min): 70 5 (max): 30	Values from (EU funded re	TABULA project esearch project)

### D. Solid waste

Solid waste col infrastruct	llection ure D1.1	Unit of measurment	Benchmark	Rationale
D1	Availability of solid waste collection	%	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	G3.2	Unit of measurment	Benchmark	Rationale
G3	Availability and proximity of a public primary school	%	0 (min):  30 5 (max): 60	Based on national regula- tion (DM 75/75, evaluated with municipal offices)
H. Economy				
Economic performance	H1.1	Unit of measurment	Benchmark	Rationale
H1	Average annual per-capita income of residents	%	0 (min): 80 5 (max): 90	Based on technical report (Rapporto Rota)
I. Climate change: mitiga	ation and adaptation			
Greenhouse gas emissions	11.1	Unit of measurment	Benchmark	Rationale
	Total amount of green- house gases (equivalent			

Availability of public and private facilities and services	G3.2	Unit of measurment	Benchmark	Rationale
G3	Availability and proximity of a public primary school	%	0 (min):  30 5 (max): 60	Based on national regula- tion (DM 75/75, evaluated with municipal offices)
ł. Economy				
Economic performance	H1.1	Unit of measurment	Benchmark	Rationale
H1	Average annual per-capita income of residents	%	0 (min): 80 5 (max): 90	Based on technical report (Rapporto Rota)
Climate change: mitig	ation 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	kgCO2/ 1000m2	0 (min): 22,5 5 (max): 0	Technical evaluation

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 To set the weight for category level, it is necessary to define a category as: priority factor for each of them.  $W_{i,j} = \frac{Lj}{\sum_{j=1}^{N_c^{(i)}} Lj} \times 100$ 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 Where: higher priority. Wi,j= weight of category Cj,k includ-

### Example:

### Category: Social aspects

Category	Priority factor(PF)	Formula	Weight
G1. Accesibility	3	W=(3/35)*100	8,5%
G2. Housing	4	W=(4/35)*100	11,4%
G3. Availability of public and private facilities and services	4	W=(4/35)*100	11,4%
G4. Education	2	W=(2/35)*100	5,7%
G5. Social inclusion	4	W=(4/35)*100	11,4%
G6. Safety	5	W=(5/35)*100	14,2%
G7. Health	5	W=(5/35)*100	14,2%
G8. Food and security	3	W=(3/35)*100	8,5%
G9. Cultural and heritage	3	W=(3/35)*100	8,5%
G10. Perceptual	2	W=(2/35)*100	5,7%
			4.0.001

ed in issue Ai Lj = priority factor of category Cj,k included in issue

100%

### 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 all the energy criteria whose effect is very strong on the terri-High 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

3. Safety in mobility					
Criterion	lmpact (Pk)	Intensity (lk)	Extent (Ek)	Duration (Dk)	Adjustm (Ak)
F3.1 Pedestrian infra- structure	12	2	3	2	1
F3.2 Availability of side- walks	12	2	3	2	1
F3.3 Safety of bicycle lines	12	2	3	2	1
F3.4 Traffic fatalities	60	3	5	4	1
xample step 2: Weights assig	nment in the	e category F3 Formula		Weight	:
F3.1 Pedestrian infra- structure	(1	2/96)*100		12,5%	
F3.2 Availability of side-	(1	2/96)*100		12,5%	
walks					
F3.3 Safety of bicycle lines	(1	2/96)*100		12,5%	
F3.3 Safety of bicycle lines	(1 (6	2/96)*100 50/96)*100		12,5% 62,5%	

SNTool MED

### Defintion:

Main elements:

10 lssues 43 Categories 134 Criteria





SNTool MED

SNTool MED



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

A	Use of land and biodiversity		
A1	Use of land		
CODE	CRITERION	INDICATOR	UNIT
A1.1	Population density	Population density in built-up areas (neighbourhood area minus green and blue)	Inhabitants / km²
A1.2	Urban compactness	Relation between the usable space of the buildings (volume) and the urban space (area)	m <sup>3</sup> / m <sup>2</sup>
A1.3	Homogeneity of the urban fabric	Percentage of the perimeter of the area directly adjacent to urbanized areas	%
A1.4	Conservation of land	Pre-development ecological value of land	Score
A2	Green urban areas		
CODE	CRITERION	INDICATOR	UNIT
A2.1	Availability of green urban areas	Proportion of all vegetated areas within the neighborhood boundaries in relation to the total area	%
A2.2	Green areas in relation to the neigh- borhood population	Total area of green in the neighbor- hood divided by neighborhood's total population	m²/inhabitant
A2.3	Green Area Accessibility	Percentage of inhabitants with accessibility to green areas	%
A2.4	Green zones density	Density of green spaces within the area	%
		Share of natural green areas on total	

A3	Biodiversity and ecosystems	
CODE	CRITERION	
A3.1	Connectivity measures for natural areas	Share of connect
A3.2	Biodiversity in green zones	Number vegetal
В	Energy	
B1	Energy infrastructure	
CODE	CRITERION	
B1.1	Access to electrical service	Percent authoriz
B2	Energy infrastructure	
CODE	CRITERION	

A3	Biodiversity and ecosystems		
CODE	CRITERION	INDICATOR	UNIT
A3.1	Connectivity measures for natural areas	Share of natural areas that are connected	%
A3.2	Biodiversity in green zones	Number of plants on number of vegetal species	%
В	Energy		
B1	Energy infrastructure		
CODE	CRITERION	INDICATOR	UNIT
B1.1	Access to electrical service	Percentage of households with authorized access to electricity	%
B2	Energy infrastructure		
CODE	CRITERION	INDICATOR	UNIT
CODE B2.1	CRITERION Total final thermal energy consump- tion for building operations	INDICATOR Aggregated annual total final ther- mal energy consumption per aggre- gated indoor useful floor area	UNIT kWh/m²/yr
CODE B2.1 B2.2	CRITERION Total final thermal energy consump- tion for building operations Total final thermal energy consump- tion for residential building opera- tions	INDICATOR Aggregated annual total final ther- mal energy consumption per aggre- gated indoor useful floor area Aggregated annual final thermal energy consumption of residential buildings per aggregated internal useful floor area	UNIT kWh/m²/yr kWh/m²/yr
CODE B2.1 B2.2 B2.3	CRITERION Total final thermal energy consump- tion for building operations Total final thermal energy consump- tion for residential building opera- tions Total final thermal energy consump- tion for public office/ educational building operations	INDICATOR Aggregated annual total final ther- mal energy consumption per aggre- gated indoor useful floor area Aggregated annual final thermal energy consumption of residential buildings per aggregated internal useful floor area Aggregated annual final thermal energy consumption of public office and educational buildings per aggre- gated internal useful floor area	UNIT kWh/m²/yr kWh/m²/yr kWh/m²/yr
CODE B2.1 B2.2 B2.3 B2.3	CRITERION Total final thermal energy consump- tion for building operations Total final thermal energy consump- tion for residential building opera- tions Total final thermal energy consump- tion for public office/ educational building operations Total final electrical energy con- sumption for building operations	INDICATOR Aggregated annual total final ther- mal energy consumption per aggre- gated indoor useful floor area Aggregated annual final thermal energy consumption of residential buildings per aggregated internal useful floor area Aggregated annual final thermal energy consumption of public office and educational buildings per aggre- gated internal useful floor area Aggregated annual total final electric energy consumption per aggregated internal useful floor area	UNIT kWh/m²/yr kWh/m²/yr kWh/m²/yr kWh/m²/yr
CODE B2.1 B2.2 B2.3 B2.3 B2.4 B2.5	CRITERIONTotal final thermal energy consumption for building operationsTotal final thermal energy consumption for residential building operationsTotal final thermal energy consumption for public office/ educational building operationsTotal final electrical energy consumption for residential building operations	INDICATOR Aggregated annual total final ther- mal energy consumption per aggre- gated indoor useful floor area Aggregated annual final thermal energy consumption of residential buildings per aggregated internal useful floor area Aggregated annual final thermal energy consumption of public office and educational buildings per aggre- gated internal useful floor area Aggregated annual total final electric energy consumption per aggregated internal useful floor area Aggregated annual final electrical energy consumption of residential buildings per aggregated indoor useful floor area	UNIT kWh/m²/yr kWh/m²/yr kWh/m²/yr kWh/m²/yr

B2.6	Total final electric energy consump- tion for public office/ educational building operations	Aggregated annual final electric energy consumption of public office and educational buildings per aggre- gated internal useful floor area	kWh/m²/yr
B2.7	Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area	kWh/m²/yr
B2.8	Total primary energy demand for residential building operations	Ratio of average total primary ener- gy consumption of residential build- ings to the local minimum value	%
B2.9	Total primary energy demand for public office/educational building operations	Ratio of average total primary en- ergy consumption of public office/ educational buildings to the local minimum value	%
B2.10	Energy consumption of public lighting	Total electricity consumption of public street lighting divided by the total distance of streets where street lights are present	kWh/кm/ yr
B3	Renewable Energy		
CODE	CRITERION	INDICATOR	UNIT
B3.1	Share of renewable energy on-site, relative to total final thermal energy consumption for building operations	Total consumption of final thermal energy generated from renewable sources on-site divided by total final thermal energy consumption	%

Share of renewable energy on-site,

relative to total final thermal energy

consumption for residential building

operations

Share of renewable energy on-site,

relative to total final thermal energy

consumption for public office/edu-

cational building operations

Share of renewable energy on-site,

relative to final electric energy

consumption

Share of renewable energy on-site,

relative to total final electric energy

consumption for residential building

operations

Total consumption of final thermal

energy generated from renewable

Total consumption of final thermal

energy generated from renewable

public office/educational buildings

Total consumption of final electric energy generated from renewable

electric energy consumption

sources on-site divided by total final

Total consumption of final electric

energy generated from renewable

electric energy consumption of

residential buildings

sources on-site divided by total final

thermal energy consumption of

sources on-site divided by total final

thermal energy consumption of

residential buildings

sources on-site divided by total final

	Water	
B3.9	Share of renewable energy on-site, on total primary energy consump- tions for public office/ educational building operations	Total co gy gene es on-s energy educati
B3.8	Share of renewable energy on-site, relative to total primary energy consumption for residential building operations	Total co gy gene es on-s energy building
B3.7	Share of renewable energy on-site, relative to total primary energy consumption for building operations	Total co gy gene es on-s energy
0.0	i tions for public office/educational i building operations	electric public c

Share of renewable energy on-site,

on final electric energy consump-

B3.6

Water	infrastr	ucture
		accare

CODE	CRITERION	INDICATOR	UNIT
C1.1	Availability of a public municipal water supply	Percentage of the buildings within the neighborhood that are served by a municipal water supply	%
C1.2	Availability of wastewater treatment system	Percentage of buildings within the neighbourhood that are served by wastewater collection	%
C2	Water Consumption		

CODE	CRITERION	
C2.1	Total water consumption	I Total a I water I divideo
C2.2	Efficiency in water use	Volum volum the tot
C2.3	Consumption of potable water in residential buildings	I Annua I per oc
C2.4	Consumption of potable water in public offices	Annua per oc
SNTool ME	D	

	-
50	

B3.5

B3.2

B3.3

B3.4

	_
CNITOOL ME	

%

%

%

%

Total consumption of final electric energy generated from renewable sources on-site divided by total final electric energy consumption of public office/educational buildings	%
Total consumption of primary ener- gy generated from renewable sourc- es on-site divided by total primary energy consumption	%
Total consumption of primary ener- gy generated from renewable sourc- es on-site divided by total primary energy consumption of residential buildings	%
Total consumption of primary ener- gy generated from renewable sourc- es on-site divided by total primary energy consumption of public office/ educational buildings	%

INDICATOR	UNIT
amount of the neighborhood's consumption in litres per day d by the total neighborhood ation	l/day/occupant
e of water supplied minus the e of utilized water divided by tal volume of water supplied	%
l potable water consumption cupant	L/occupant/yr
l potable water consumption cupant	L/occupant/yr

C2.5	Consumption of potable water in educational buildings	Annual potable water consumption per occupant	L/occupant/yr
C2.6	Re-use of rainwater in residential buildings	Share of rainwater collected from roofs of residential buildings for reuse	%
C2.7	Consumption of potable water in public green spaces	Potable water used for irrigation purposes in public green spaces	 m³/m²
C2.8	Solar powered water desalinisation	Percentage of water acceptable for human consumption or agriculture from solar desalination	%
C3	Effluents management		

\_

\_ \_ \_ \_ \_ \_ \_ \_ \_ \_

\_

CODE	CRITERION	INDICATOR	UNIT
C3.1	I I I I I I	<ul> <li>Total volume of wastewater collect-</li> <li>ed for at least secondary treatment</li> <li>in centralized wastewater treatment</li> <li>facilities divided by the total vol-</li> <li>ume of wastewater produced in the</li> <li>neighborhood</li> </ul>	     % 
C3.2	Public wastewater (from outdoor areas) that is disposed or treated	Percent of public wastewater that is disposed or treated	     %
C3.3	Solar powered water desalinisation	Percentage of households with ac- cess to basic sanitation facilities	     % 

### Solid Waste

### Solid waste collection infrastructure

CODE	CRITERION	INDICATOR	UNIT
D1.1	Availability of solid waste collection	Percentage of buildings with regular solid waste collection	1 1 % 1
	1	1	1
D1	Solid waste collection infrastruc	ture	

CODE	CRITERION	INDICATOR	UNIT
D2.1	Access to solid waste and recycling collection points	Proximity of the resident popula- tion to the solid waste and recycling collection point	%
D2.2	Access to solid waste and recycling collection points	Percentage of inhabitants with access to solid waste and recycling collection points within 400 meters walking distance	%
52			SNTool MED

E	Environmental quality	
E1	Air quality	
CODE	CRITERION	
E1.1	Fine particulate matter (PM2.5) concentration	Numbo PM2.5 daily li
E1.2	Particulate matter (PM10) concentration	Numbo PM10 daily li
E1.3	Nitrogen Dioxide concentration (NO2)	Numbo NO2 co limit
E1.4	Sulfur Dioxide concentration (SO2)	Numbo SO2 cc limit
E1.5	Ozone concentration (O3)	Numbo O3 cor limit
E2	Noise	
CODE	CRITERION	
E2.1	Ambient daytime noise conditions	Percer noise l
E2.2	Ambient night-time noise conditions	Percer noise l
E3	EMF exposure	
CODE	CRITERION	
E3.1	Exposure to high frequency electro- magnetic fields	Percen tenna: exposi
E3.2	Percentage of buildings exposed to ELF magnetic field	Percen located distand
E4	Environmental impacts	
CODE	CRITERION	
E4.1	Degree of atmospheric light pol-	Percen

SNTool MED

\_ \_ \_ \_ \_

\_ \_

INDICATOR	UNIT
er of days within a year that concentration exceeds the mit	days / yr
er of days within a year that concentration exceeds the mit	days / yr
er of days within a year that oncentration exceeds the daily	μg/m³
er of days within a year that oncentration exceeds the daily	μg/m³
er of days within a year that ncentration exceeds the daily	μg/m³

INDICATOR	UNIT
itage of building area over imit	   % 
itage of building area over imit	%

INDICATOR	UNIT
ntage of mobile network an- sites in compliance with EMF ure guidelines	%
ntage of buildings in the area d not respecting the safety ce from high voltage lines	,

INDICATOR	UNIT
itage of lighting fixtures with d luminous emission ient equal to 0%	%

### Transportation and mobility

### <sup>F1</sup> Performance and mobility services

CODE	CRITERION	INDICATOR	UNIT
F1.1	Performance of the public transport system	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop	I I I I
F1.2	Walking distance to public transport for area workers and students	Percent of workers and students who can reach a public transport stop within a 400 meters distance	I %

### 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	Bicycle network	Total length of bicycle paths in the neighborhood per inhabitant	n/inhabitant
F2.4	Shared bicycles	Number of shared bicycles per 1.000 inhabitants	n/1.000 inhabitants
F2.5	A Availability of bicycle parking facilities	<ul> <li>Bicycle parking spaces per</li> <li>inhabitant</li> </ul>	n/inhabitant
FO			

### F3 Safety in mobility

CODE	CRITERION	INDICATOR	UNIT
F3.1	I I I Pedestrian infrastructure I	<ul> <li>Percentage of the neighborhood</li> <li>designated as a pedestrian/car free</li> <li>zone</li> </ul>	   % 
F3.2	Availability of sidewalks	Percentage of roads' length that has dedicated sidewalks	%  %
F3.3	I Safety of bicycle lines	<ul> <li>Percentage of bicycle paths physical-</li> <li>ly separated from traffic roads</li> </ul>	I % I %
F3.4	Traffic fatalities	<sup>I</sup> Traffic fatalities per 1.000 inhabi- <sup>I</sup> tants	I n/1.000 inhabitants
F4	Safety in mobility		

CODE	CRITERION	INDICATOR	UNIT
F3.1	Cyclomatic complexity of the street network	i i Cyclomatic number i i	number
F3.2	Connectivity of the street network	Number of intersections related to the overall surface area	number/km²
54			SNTool MED

G	Social Aspects	
G1	Accessibility (disabled persons)	
CODE	CRITERION	
G1.1	Public buildings that are accessi- ble for use by physically disabled persons	Percen are acc disable
G1.2	Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons	Percen destria use by
G1.3	Barrier-free accessibility in local outdoor public areas	Adequa public the tot
G2	Housing	
CODE	CRITERION	
G2.1	Affordability of housing property	Housir that ar lowest
G2.2	Affordability of housing rental	Percen the low used fo
G2.3	Vacant residential units in the neighborhood	Percent units
G2.4	I Informal settlements	Percen slums, equate
G3	Availability of public and private	facilitie
CODE	CRITERION	
G3.1	Availability and proximity of key services	Percen within of at le
G3.2	Availability and proximity of a public primary school	Percen public
G3.3	Availability and proximity of a public secondary school	Percent public s
G3.4	Availability and proximity of childrens' play facilities	Percen childre
G3.5	Open space for public use	Averag of the r space f
SNTool M	ED	

INDICATOR	UNIT
nt of key public buildings that cessible for use by physically ed persons	%
nt of sidewalks and other pe- an ways that are accessible for physically disabled persons	%
acy of barrier-free accessible outdoor areas compared to al public area	~ %

INDICATOR	UNIT
ng properties in the local area re financially accessible to the quintile of area population	%
tage of the average salary of vest quintile of the population or rental payments	   % 
tage of vacant residential	   % 
tage of inhabitants living in informal settlements or inad- housing	

### es and services

INDICATOR	UNIT
ntage of inhabitants that are 800 meters walking distance east 3 key services	%
ntage of population near a primary school	%
tage of population near a secondary school	%
ntage of population near a ens' play facilities	%
ge share of the built-up area neighborhood that is open for public use	%

G4	Education		
CODE	CRITERION	INDICATOR	UNIT
G4.1	Primary enrollment rate	Net primary enrollment rate	%
G4.2	Rate of female scholarship	Ratio of female to male mean years of education received of population age 25+	     % 
G4.3	Secondary school enrollment	Lower secondary completion rate	/ / %
G4.4	Tertiary education	Population age 25-34 with tertiary educational attainment	   %

### G5 Social inclusion

1

CODE	CRITERION	INDICATOR	UNIT
G5.1	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)	%
G5.2	Population at risk of poverty or exclusion	hare of persons with an equivalised disposable income below 60 % of the national median income	%
G6	Safety		

1

\_ \_

SNTool MED

\_ \_

CODE	CRITERION	INDICATOR	UNIT
G6.1	Police service	Number of police officers per 1.000 inhabitants	n/1.000 inhabitants
G6.1	Fire service	Number of firefighters per 1.000 inhabitants	n/1.000 inhabitants
G6.1	Population living in disaster prone areas	Percentage of inhabitants living in a zone subject to natural hazards	%
G7	Health		
CODE	CRITERION	INDICATOR	UNIT
G7.1	In-Patient Hospital Beds	Number of in-patient public hospital beds per 1.000 inhabitants	n/1.000 inhabitants

\_\_\_\_ \_

G8	Food security		
CODE	CRITERION	INDICATOR	UNIT
G8.1	Urban agricultural land	Area of urban agricultural land on total neighborhood area	%
G9	Culture and Heritage		
CODE	CRITERION	INDICATOR	UNIT
G9.1	Compatibility of urban design with local cultural values	Compatibility with local area tradi- tional values of street layouts and the character of urban spaces	Score
G9.2	Compatibility of public open space with local cultural values	Compatibility with local area tradi- tional values of local public open spaces, including major uses, dimen- sions and adjacent uses	Score
G10	Perceptual		
CODE	CRITERION	INDICATOR	UNIT
G10.1	Perceived safety of public areas for pedestrians	Perceived safety of public places and pedestrian routes, as determined by a sample of pedestrians	Score
G10.2	Impact of commercial signage on the visual environment	Visual impact of exterior commercial signage	Score
G10.3	Impact of overhead electric distribution system	Visual impact of above-grade electri- cal distribution systems	Score
Н	Economy		
H1	Economic performance		
CODE	CRITERION	INDICATOR	UNIT
H1.1	Average annual per-capita income of residents	Percentage of average per-capita income	%
H2	Employment	1	
CODE	CRITERION	INDICATOR	UNIT
H2.1	Unemployment rate	Percentage of working age adults unemployed or actively looking for work	%
H2.2	Youth unemployment rate	Percentage of unemployed youth	%
SNTool M			57

56

1 1

Н3	Innovation		
CODE	CRITERION	INDICATOR	UNIT
H3.1	New business registration rate	Proportion of business registrations per 10.000 inhabitants aged 16 and above	n
H4	ICT infrastructure		
CODE	CRITERION	INDICATOR	UNIT
H4.1	Fixed Broadband Subscriptions	Percentage of households with fixed (wired) broadband	%
H4.2	Wireless Broadband Coverage	Percentage of the neighborhood area served by wireless broadband (3G, 4G, 5G)	%
H4.3	Availability of WIFI in Public Areas	Number of public WIFI hotspots in the neighborhood per 1000 inhabi- tants	n/1.000 inhabitants
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 inhabitants
	Climate Change: mitigation and	adaptation	
11	Climate change mitigation		

CODE	CRITERION	INDICATOR	UNIT
11.1	I I I Greenhouse gas emissions I I	<ul> <li>Total amount of greenhouse gases</li> <li>(equivalent carbon dioxide units)</li> <li>generated from building operations</li> <li>over a calendar year per inhabitant</li> </ul>	t CO <sub>2</sub> eq. / inhabitant/yr
11.2	Greenhouse gas emissions from residential buildings	<ul> <li>Total amount of greenhouse gases in</li> <li>Kg (equivalent carbon dioxide units)</li> <li>generated over a calendar year per</li> <li>aggregated indoor useful floor area</li> </ul>	Kg CO <sup>2</sup> eq / m <sup>2</sup>
 I1.3	Embodied carbon for construction and renovation of infrastructures	Aggregated total embodied carbon per aggregated linear area	kg CO <sub>2</sub> eq / m <sup>2</sup>
 I1.4	Embodied carbon for construction/ Embodied carbon for construction/ renovation of residential buildings	Aggregated total embodied carbon per aggregated indoor useful floor area	kg CO <sub>2</sub> eq / m <sup>2</sup>
 I1.5	Embodied carbon for construction/ renovation of public offices/educa- tional buildings	Aggregated total embodied carbon per aggregated indoor useful floor area	kg CO <sub>2</sub> eq / m <sup>2</sup>
11.6	CO2 sequestration	Potential CO2 sequestraion in the neighborhood per hectare	kg CO <sub>2</sub> eq / m <sup>2</sup>
 58			SNTool MED

Adaptatior	i to the c	limatic	action:	heat
------------	------------	---------	---------	------

CODE	CRITERION	INDICATOR	UNIT
12.1	I Albedo I I	Mean Solar Reflectance Index of paved surfaces and roofs in the neighborhood	SRI I
I2.2	Use of vegetation to provide ambient outdoor cooling	Leaf Area Index: ratio of total vege- tated surface area (on ground and on roofs, and including trees), divid- ed by total site area	Index
12.3	I Green roofs I	<sup>I</sup> Aggregate area of building roofs <sup>I</sup> covered with vegetated material I	   %

### Adaptation to the climatic action: pluvial flood

13

15

CODE	CRITERION	INDICATOR	UNIT
13.1	Stormwater retention capacity on site by buildings	Share of the attenuation storage capacity by buildings in relation to the optimal volume	   % 
I3.2	I – – – – – – – – – – – – – – – – – I I Sustainable Urban Drainage I	<ul> <li>I =</li></ul>	     % 
- <b></b> I3.3	Permeability of land	Percentage of weighted ground permeability	     % 
14	Adaptation to the climatic action	n fluvial and coastal flood	1

CODE	CRITERION	INDICATOR	UNIT
14.1	I Flood risk	Percentage of population exposed to flood risk	%
 14.2	Protection of vulnerable zones	Share of land in vulnerable areas protected by flooding barriers	  %
I4.3	Protection of buildings from flooding	Share of buildings with elevated ground floor in vulnerable sites	 

### Adaptation to the climatic action: drought

CODE	CRITERION	INDICATOR	UNIT
15.1	<ul> <li>Rainwater collection and storage</li> <li>from buildings for non-potable uses</li> </ul>	I Share of buildings in the neighbor- hood with a rainwater collection system	I I I I I
15.2	Rainwater collection and storage from outdoor areas	Share of rainwater collected from paved (not permeable) surfaces in the neighborhood (excluding build- ings' roofs and plots)	
SNTool MI	! FD	I	I 59

### waves and increase of temperature

 15.3	I	Share of buildings in the neighbor- hood with a greywater collection	
15.4	I I Local vegetation I	I Share of landscape (green areas) plated with local vegetation	%
16	Adaptation to the climatic action	n: pluvial flood	
CODE	CRITERION	INDICATOR	UNIT
l6.1	i Wildfire risk I	Percentage of population exposed to wildfire risk I	%
 I6.2	I	I	
16.3	I I I Fireproof ground	I       I       I       I         I       Share of ground cover materials       I         I       (excluding buildings' plots) in vulner-       I         I       able areas that are fire resistant       I	%
17	Climatic hazard: wind		
CODE	CRITERION	INDICATOR	UNIT
17.1	l Windproof urban form	Strategies to minimise the impact of wind	Score
	1	I	
J	Governance		
J J1	Governance Urban Planning		
J J1 CODE	Governance Urban Planning CRITERION	I I I I INDICATOR	UNIT
J J1 CODE J1.1	Governance Urban Planning CRITERION Community involvement in urban planning activities	INDICATOR Percentage of residents active in public urban planning	UNIT Level
J J1 CODE J1.1 J2	Governance Urban Planning CRITERION Community involvement in urban planning activities Management and community in	INDICATOR Percentage of residents active in public urban planning volvement	UNIT Level
J J1 CODE J1.1 J2 CODE	Governance Urban Planning CRITERION Community involvement in urban planning activities Management and community in CRITERION	INDICATOR Percentage of residents active in public urban planning volvement INDICATOR	UNIT Level UNIT
J J1 CODE J1.1 J2 CODE J2.1	Governance Urban Planning CRITERION Community involvement in urban planning activities Management and community in CRITERION Involvement of residents in commu- nity affairs	INDICATOR Percentage of residents active in public urban planning volvement INDICATOR Percentage of resident population above 16 years having an involve- ment in community affairs	UNIT Level UNIT %
J J1 CODE J1.1 J2 CODE J2.1 J3	Governance Urban Planning CRITERION COMMUNITY INVOLVEMENT IN Urban planning activities Management and community in CRITERION Involvement of residents in community affairs Management and community in	INDICATOR Percentage of residents active in public urban planning volvement INDICATOR Percentage of resident population above 16 years having an involve- ment in community affairs	UNIT Level UNIT %
J J1 CODE J1.1 J2 CODE J2.1 J3 CODE	Governance Urban Planning CRITERION COMMUNITY INVOLVEMENT IN Urban planning activities Management and community in CRITERION Involvement of residents in commu- nity affairs Management and community in CRITERION	INDICATOR Percentage of residents active in public urban planning volvement INDICATOR Percentage of resident population above 16 years having an involve- ment in community affairs volvement INDICATOR	UNIT Level UNIT % UNIT
J J1 CODE J1.1 J2 CODE J2.1 J3 CODE J3.1	Governance Urban Planning CRITERION COMMUNITY INVOLVEMENT IN Urban planning activities Management and community in CRITERION Involvement of residents in commu- nity affairs Management and community in CRITERION Public buildings sustainability	INDICATOR Percentage of residents active in public urban planning volvement INDICATOR Percentage of resident population above 16 years having an involve- ment in community affairs volvement INDICATOR Percentage of population exposed to wildfire risk	UNIT Level UNIT %
J J1 CODE J1.1 J2 CODE J2.1 J3 CODE J3.1	Governance Urban Planning CRITERION Community involvement in urban planning activities Management and community in CRITERION Involvement of residents in commu- nity affairs Management and community in CRITERION Public buildings sustainability Operating energy costs for public buildings	INDICATOR Percentage of residents active in public urban planning Volvement INDICATOR Percentage of resident population above 16 years having an involve- ment in community affairs Volvement INDICATOR Percentage of population exposed to wildfire risk Aggregated annual operating energy cost per aggregated indoor useful floor area	UNIT Level UNIT % UNIT %

Total end buildings divided b of these
l b d o

nd use of energy in public			
gs within a neighborhood			
by total indoor useful area	1	kWh/m <sup>2</sup>	
e buildings	1		

# 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.

	A. Use of Lo Biodive	ınd and rsity	SN Tool	
A1	Urban Structu	re		
A1.2	Urban Compa	ictness	1	
Intent: To maximize efficiency in the use of land used for buildings.				
	ndicator	Unit of Measure		

Relation between the	
usable space of the	m <sup>3</sup> / m <sup>2</sup>
buildings (volume) and the	
urban space (area).	

### **Assessment Methodology:**

1. Calculate the aggregate gross volume of all buildings in the local area, in m<sup>3</sup>

2. Calculate the net developable area by stubtracting the surface area used for parks, streets, parking and, pedestrian areas from the gross surface area of the locality.

**3.** Determine the ratio of the aggregate volume of the buildings to the net local developable area, expressed as m³/ha.

l:	Reference:
	1.CESBA MED Proje
	2 SNTool Assessmer

	A. Use of L Biodiv	and and ersity	SN Tool
A1	Urban Structu	ıre	
A1.1	Population De	ensity	
Inter betw	nt: To evaluate the een residents and	increase of the proximit local goods and service	y s.
h	ndicator	Unit of Measure	9
Populo bui (neighboi gree	tion density in lt-up areas. hood area minus n and blue).	Inhabitants / km²	
Assessm	ent Methodolog	y:	
1. Ca 2. Ca (neig) 3. Ca The n per so	lculate the total ne (A) - r lculate the total are hborhood area min (B) - de lculate the value of esult shall be expre quare kilometer.	ighborhood population. numerator ea of the neighborhood us green and blue) . enominator f the indicator as A/B. ssed as number of perso	ns
Standar	d: _	Reference: 1.CESBA MED Project 2 SNT∞l Assessment S	System.

	A. Use of Land and Biodiversity	SN Tool
A1	Urban Structure	
A1.3	Homogeneity of the Urban Fabric	
Intent: To	o identify voids in the urban fabric and c	at the

same time to contain the peripheral expansion.

Indicator	Unit of Measure
Percentage of the perimeter of the area directly adjacent to urbanized areas.	%

### **Assessment Methodology:**

Standard:

1. Quantify the total length of the perimeter of the area anayzed (A).

2. Evaluate by quantifying, the linear meters of urban fabric adjacent to the urbanized areas (B). 3. Calculate the percentage ratio between the length of the urban fabric perimeter adjacent to the urbanized areas and the overall length of the perimeter of the area:  $(B/A)^*$  100.

> **Reference:** 2 SNTcol Assessment Sys

CNITeel	MED
211001	IVIEL

000	A. Use of I Biodiv	and and ersity		SN Tool
A1	Urban Struct	ure		
A1. 4	Conservation	of Land		
Intent: To value for	determine the prop ecological or agr unde	ortion of land, co icultural purpos eveloped.	onsidered to ses, that r e	o be of emains
h	ndicator	Unit of	Measu	'e
Pre-deve val	eloped ecological ue of land.	Sco	ore	
Assessm 1. Detern 2. Detern considered value. 3. Calcul the total -Only and also in co account. -The area the perin -Parks an -Definition to native	nine the area of the nine the area of the ed by authorities to ate the ratio betwee area of the neighborh ase of reconverted of as of the neighborh neter selection. Ind squares are not of on of agricultural var ral objectives (food, on of ecological value life forms, making	a neighborhood. a undeveloped lo be of ecological en the undevelo orhood. decological or a areas, must be to considered under lue: an area that forage, etc.). ue: an area that up natural ecos	and that is and agricu ped area an gricultural v aken into included wi eveloped lar st is intende provides su ystems.	ltural nd value, thin nd. ed for upport
Stand	ard: -	<b>Referenc</b> 1.CESBA M 2 SNTool A	: <b>e:</b> IED Project Issessment S	System.
	A. Use of	Land and		SN Tool

- <u>-</u>	BIOGIV	/ersity
A2 A2.2	Green Urban Green Areas in Re Population	Areas elation to the Neighborhood
Intent: To regulate supplies	improve the air quality and clii and protecting lai ru	urban environment helping mate, recharging groundwater kes and streams from polluted unoff.
h	ndicator	Unit of Measure
Total gr neighbo po	een area in the orhood by total opulation.	m²/inhabitant
Assessm	ent Methodolog	ay:
1. Ca neigh 2. Ca 3. Ca	lculate the total of borhood (m²). (A)- 1 lculate the neighb (B)-Da lculate the value c A/B (m²	green areas in the Numerator orhood's total population. enominator of the indicator as: ?/inhabitants)
Standa	rd:	Reference:
		IEFCA 2019 Edition- Calculation Guideline

SNTool MED

A. Use of I Biodiv	Land and versity	SN Tool		
A2 Green Urban	n Areas			
A2.1 Availability of	Green Urban Areas			
Intent: To improve the permeability of the area and to benefit from the availability of green spaces (capturing pollutants, reducing the "heat island" effect, providing recreational spaces, etc.).				
Indicator	Unit of Measur	e		
Proportion of all vegetated areas within the neighborhood in relation to the total area.	%	_		
Assessment Methodolog	g <b>y:</b>			
<ol> <li>Calculate the amoun hectares) in the neighbor</li> </ol>	it of vegetated areas (in orhood.			
(A) - <b>2.</b> Calculate the total a	numerator rea of the neighborhood .			
(B)- d <b>3.</b> Calculate the value c ,	enominator of the indicator as: A/B (%)			
Standard:	Reference:	I		
-	2 SNTool Assessment S	System.		
A. Use of I Biodiv	Land and versity	SN Tool		
A. Use of Biodiv A2 Green Urban	Land and versity n Areas	SN Tool		
A. Use of Biodiv A2 Green Urban A2.3 Green Area A	Land and versity n Areas accessibility	SN Tool		
A. Use of Biodiv A2 Green Urban A2.3 Green Area A Intent: To work towards a neighborhood's inhabitan effects of the ur	Land and versity Areas Accessibility higher quality of life for ts and to reduce the neg rbanization process.	SN Tool or the gative		
A. Use of Biodiv A2 Green Urban A2.3 Green Area A Intent: To work towards a neighborhood's inhabitan effects of the ur Indicator	Land and versity Areas Accessibility higher quality of life for ts and to reduce the neg rbanization process. Unit of Measure	SN Tool or the gative		
A2 Green Urban A2 Green Urban A2.3 Green Area A Intent: To work towards a neighborhood's inhabitan effects of the ur Indicator Percentage of inhabitants with accessibility to green areas.	Land and versity Areas Accessibility higher quality of life for ts and to reduce the neg rbanization process. Unit of Measure %	SN Tool		
A. Use of Biodiv A2 Green Urban A2.3 Green Area A Intent: To work towards a neighborhood's inhabitan effects of the ur Indicator Percentage of inhabitants with accessibility to green areas.	Land and versity Areas Accessibility higher quality of life for ts and to reduce the neg rbanization process. Unit of Measure %	SN Tool		
A. Use of Biodiv A2 Green Urban A2.3 Green Area A Intent: To work towards a neighborhood's inhabitan effects of the ur Indicator Percentage of inhabitants with accessibility to green areas. Assessment Methodolog 1. Calculate the numbe 300 meter distance of a space of at least 0.5 ha (A) -	Land and versity Areas Accessibility higher quality of life for ts and to reduce the neg rbanization process. Unit of Measure %	SN Tool		
A. Use of Biodiv A2 Green Urban A2.3 Green Area A Intent: To work towards a neighborhood's inhabitan effects of the ur Indicator Percentage of inhabitants with accessibility to green areas. Assessment Methodolog 1. Calculate the numbe 300 meter distance of a space of at least 0.5 ha (A) - 2. Calculate the neighb (B)- d	Land and versity Areas Accessibility I higher quality of life for ts and to reduce the neg- rbanization process. Unit of Measure % Sy: er of inhabitants living with a publicly accessible green numerator porhood's total population enominator	SN Tool		
A. Use of Biodiv A2 Green Urban A2.3 Green Area A Intent: To work towards a neighborhood's inhabitan effects of the ur Indicator Percentage of inhabitants with accessibility to green areas. Assessment Methodolog 1. Calculate the numbe 300 meter distance of a space of at least 0.5 ha (A) - 2. Calculate the neighb (B) - d 3. Calculate the value of a	Land and versity Areas Accessibility I higher quality of life for ts and to reduce the neg- rbanization process. Unit of Measure % Py: Pr of inhabitants living with a publicly accessible green I numerator porhood's total population enominator of the indicator as: A/B (%)	SN Tool		
A. Use of Biodiv A. Green Urban A. Green Urban Green Area A Intent: To work towards a neighborhood's inhabitan effects of the ur Indicator Percentage of inhabitants with accessibility to green areas. Assessment Methodolog 1. Calculate the number 300 meter distance of a space of at least 0.5 ha (A) - 2. Calculate the number (B) - d 3. Calculate the value of a space of at least 0.5 ha (B) - d	Land and versity A Areas Accessibility I higher quality of life for the and to reduce the neg- tranization process. Unit of Measure % Sy: r of inhabitants living with a publicly accessible green numerator porhood's total population enominator of the indicator as: A/B (%)	SN Tool		



SNTool MED



**Description of the Information** B: Issue **Bx:** Category **B1: Energy Infrastructure B2: Energy Consumption 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

$\langle \mathbf{D} \rangle$	B. Er	nergy	SN Tool	
B2 Energy Consumption Total Final Thermal Energy Consumption for Building Operations				
Intent: To estimate urban thermal energy consumption for building operations.				
Ind	icator	Unit of Measur	e i	
Aggregated annual total final thermal energy kWh/m²/yr consumption per aggregated indoor useful floor area				
Assessment Methodology:				
To perform the calculation, it is possible to use: Metered Data or Estimated Data For the evaluation of the actual performance of the urban area it is preferable to use metered data. If metered data aren't available, estimated data shall be used. Estimated data shall be used for evaluating alternative scenarios in planning and decision-making processes. In reporting the indicator's value, the data source must be indicated. Note: See anex for further details on the calculation steps.				
Standard: EN	13790	Reference: CESBA MED Project - S	NTcol	

Ð	B. E	nergy	SN Tool
B1	Energy Insfr	astructure	
B1.1	Access to Ele	ctrical Service	
Int contribu	ent: To evaluate ting indicator of econom	the electrical services as sustainability, resilienc ic productivity	a :e and
1	ndicator	Unit of Measu	re
Percento with aut	age of household horized access to electricity	%	
Asses	sment Method	ology:	
<ol> <li>Cala with au</li> <li>Cala</li> <li>Cala</li> <li>Cala</li> </ol>	ulate the number uthorized electrica (A) ulate the total po (B) - ulate the value of	of people in the neighbo I services - numerator pulation of the neighborh denominator f the indicator as =A/B	rhood ood
Standar	d: Ref ISO and Serv	erence: 37120: Sustainable Cities Communities - Indicators f ices and Quality of Life	or City
$(\mathbf{f})$	B. En	ergy	SN Tool
B2 B2.2	Energy Consu Fotal Final Therma Residential Buildin	umption Il Energy Consumption for 1g Operations	
Intent: To estimate urban thermal energy consumption per gross area of all residential buildings.			
In	dicator	Unit of Measure	) 9
Urban th consumptio of all resid	ermal energy n per gross area ential buildings	kWh/m²/yr	
Assessm	Assessment Methodology:		

1.Calculate the annual total final thermal energy consumption of non-renewable energy for the building operations (Heating, Cooling, Domestic Hot Water and Lighting), in kWh, for each residential buildings in the neighborhood.

2. Calculate the aggregated annual total final thermal energy consumption for all residential buildings. 3.Calculate the indicator:

Aggregated annual total final thermal energy consumption / Total gross area of all residential buildings.

Standard: **Reference:** CESBA MED Project - SNTool Assessment Sytem

(4) **B. Energy** SN Too **B2** Energy Consumption Total Final Thermal Energy Consumption for B2.3 Public Office/ Educational Building Operations Intent: To estimate the urban thermal energy consumption per gross area for public office/educational building operations Indicator Unit of Measure Urban thermal energy Consumption per gross kWh/m<sup>2</sup>/yr area for public office/ educational building operations **Assessment Methodology:** 1. Calculate the annual total final thermal energy consumption of non-renewable energy for building operations (Heating, Cooling, Domestic Hot Water and Lighting), in kWh, for each public office/ educational building in the neighborhood. 2. Calculate the aggregated annual total final thermal energy consumption for all public office/educational buildings. 3. Calculate the indicator as: Aggregated annual total final thermal energy consumption/ Total gross area of all public office/educational buildings **Reference:** Standard: CESBA MED Project - SNTcol Assessment System **B.** Energy SN Too **B2** Energy Consumption Total Electrical Energy Consumption for Residential B2.5 **Building Operations** Intent: To estimate urban electrical energy consumption per gross area for residential building operations Indicator Unit of Measure Urban electrical energy consumption of residential kWh/m<sup>2</sup>/yr buildings **Assessment Methodology:** 1. Calculate the annual total final electrical energy consumption of non-renewable energy for building operations (Heating, Cooling, Domestic Hot Water and, Lighting), in kWh, for each residential building in the neighborhoood. 2. Calculate the aggregated annual total final electrical energy consumption for all residential buildings. 3. Calculate the indicator:

Aggregated Total Annual Final Electrical Energy Consumption / Total Gross Area of All Residential Buildings

Standard:

CESBA MED Project - SNTool Assessment System

SNTool MED



67

![](_page_34_Picture_0.jpeg)

1. Calculate the annual total primary energy consumption of non-renewable energy for building operations (Heating, Cooling, Domestic Hot Water and Lighting), in kWh/m of gross area for each public office/educational buildings in the local area.

**2.** Calculate the neighborhood's public office/educational buildings total primary energy consumption as the weighted mean value of total primary energy.

**3.** Calculate the indicator:

Neighborhood's public office-educational buildings total primary energy consumption / Local minimum value \* 100

Standard: Reference: CESBA MED Project - SNTool Assessment System

 $(\mathbf{4})$ **B.** Energy SN Tool **B2** Energy Consumption Total Primary Energy Demand for Residential **B2.8 Building Operations** Intent: To reduce the need of energy for residential building operations Indicator Unit of Measure Ratio of average total primary energy consumption % of residential buildings to the local minimum value. **Assessment Methodology:** 1. Calculate the annual total primary energy consumption of non-renewable energy f or building operations(Heating, Cooling, Domestic Hot Water and Lighting), in kWh/m, of gross area for each residential building in the local area. 2. Calculate the neighborhood's residential total primary energy consumption as the weighted mean value of total primary energy consumption over the floor surfaces of all residential buildings in the area. 3. Calculate the indicator as: (Neighborhood Residential Total Primary Energy Consumption/Local Minimum Value)\*100 **Reference:** Standard: CESBA MED Project - SNTool Assessment System  $(\mathbf{f})$ **B.** Energy SN Too **B2 Energy Consumption** Energy Consumption of Public Lighting B2.10 Intent: To improve the efficiency of street lighting for cost-effective steps and energy efficiency Indicator Unit of Measure Total electricity kWh/Km/yr consumption of public street lighting by total distance of streets where streetlights are present **Assessment Methodology:** 1. Calculate the total electricity consumption of public street lighting for cost-effective steps and energy efficiency. (A)-Numerator 2. Calculate the length of streets where streetlights are present in the neighborhood. (B)-Denominator 3. Calculate the indicator: A/B **Reference:** Standard: ISO 3710: Sustainable Cities and

**B.** Energy SN Too **B**3 Re newable Energy Share of Renewable Energy On-Site, Relative to B3.1 Final Thermal Energy Consumption for Building Operations -----Intent: To incentive the consumption and production of renewable energy Indicator **Unit of Measure** Total consumption of final thermal energy generated % from renewable sources on-site by total final thermal energy consumption **Assessment Methodology:** 

### \_ . . . . . . . . . . . .

### To perform the calculation, it is possible to use: Metered Data or Estimated Data

For the evaluation of the actual performance of the urban area it is preferable to use metered data. If metered data aren't available, estimated data shall be used. Estimated data shall be used for evaluating alternative scenarios in planning and decision-making processes. In reporting the indicator's value, the data source must be indicated.

Note: See anex for further details on the calculation steps.

Standard:	Reference:
EN 13790	CESBA MED Project - SNTool Assessment System

B. Ener	ſġy	SN Tool	
B3       Re newable Energy         B3.3       Share of Renewable Energy On-Site, Relative to the Total Final Thermal Energy Consumption for Public Office/ Educational Building Operations         Intent: To incentive the consumption and       /			
Indicator	Unit of Measur	e	
Total consumption of final thermal energy generated from renewables sources on-site by the total final thermal energy consumption of public office/ educational buildings	%		
Assessment Methodology	<i>r</i> :	1	
1. Calculate the annual total final energy consumption of non-renewable energy for building operations (Heating, Cooling, Domestic Hot Water and Lighting), in kWh/m of gross area for each public office/educational buildings in the neighborhood, including renewables, if applicable, in the			
<ol> <li>Calculate the aggregated annual total final energy consumption for all public office/educational buildings.</li> <li>Calculate the annual total final energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each public office/educational buildings in the local area without the installed renewables, if applicable.</li> <li>Calculate the aggregated annual total final energy consumption without the renewables for all public office/ educational buildings.</li> <li>Calculate the ratio:</li> </ol>			
Aggregated annual total final energy consumption / Aggregated annual total final energy consumption without the renewables.			
Standard: •	Reference: CESBA MED Project - S Assessment System	NTool	

SNTool MED

Communities- Indicators for City Services and Quality of Life.

![](_page_34_Picture_16.jpeg)

Ì	B. Er	iergy	SN Tool
B3 B3.5 Intent: T	Renewable E Share of Renewal Relative to Total Consumption for Operations o reduce the ne building	nergy ole Energy On-Site, Final Electrical Energy Residential Buildings ed of energy for resid operations	ential
1	ndicator	Unit of Measur	е
Total consumption of final electric energy generated from renewable sources on-site divided by total final electric energy consumption of residential buildings		%	

**Assessment Methodology:** 

1.Calculate the annual total final electric energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each residential building in the local area including renewables, if applicable, in the existing condition.

condition.
2. Calculate the aggregated annual total primary energy consumption for residential buildings.
3. Calculate the annual total final electric energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each residential building in the local area without the installed renewables, if applicable. 4.Calculate the aggregated annual total final electric energy consumption without the renewables for residential buildings.

**5.**Calculate the ratio:

Aggregated annual total final electric energy consumption / Aggregated annual total final electric energy consumption without the renewables.

itandard:	Reference:
-	CESBA MED Project - SNTc Assessment System

$(\mathbf{z})$	B. Energy		SN Tool	
<b>B</b> 3	Re newable E	nergy		
<b>★</b> B3.7	Share of Renwabl Total Primary Ene Operations	e Energy On-Site, Relative rgy Consumption for Build	∍ to lings	
Intent: 1	o incentive the co renewa	nsumption and producti ble energy	on of	
	ndicator	Unit of Measur	е і	
Total consumption of primary energy generated % from renewable sources on-site divided by the total primary energy consumption				
Assessment Methodology:				
Calculate	e the indicator as:			
Aggregated total annual primary energy consumption from on-site renewable energy sources/ Aggregated total annual primary energy consumption				
Note: For further information on the calculation process go to anex				
Standa	rd:	Reference:		
	EN 13790	CESBA MED Project - S Assessment System	NIOOI	
70				

Ý	B. Ener	Зλ	SN Tool	
B3 B3.6	Re newable Ene Share of Renewable to Total Final Electric for Public Office/Edu Operation	e <b>rgy</b> Energy On-Site,Relati cal Energy Consumptio cational Buildings	ve n	
Intent: To	Intent: To incentive the consumption and production of renewa- ble energy			
I	ndicator	Unit of Measur	e i	
Total c electric e renew divided energy c office/e	consumption of final energy generated from able sources on-site by total final electric consumption of public educational buildings	%		
Accorer	nont Mothodology			

### Assessment Methodology:

1.Calculate the annual total final electric energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each public office/educational building in the local area including renewables, if applicable, in the existing condition.

 Calculate the aggregated annual total primary energy consumption for public office/educational buildings.
 Calculate the annual total final electric energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each public office/educational building in the local area without the installed renewables, if applicable.

**4.**Calculate the aggregated annual total final electric energy consumption without the renewables for public office/ educational buildings.

5. Calculate the ratio: Aggregated annual total final electric energy consumption / Aggregated annual total final electric energy consumption

without the renewables.		
tandard:	Reference:	
	CESBA MED Project - SNT Assessment System	

B. En	ergy	SN Tool	
B3 Re newable Energy B3.8 Share of Renewable Energy On-Site, Relative to the Total Primary Energy Consumption for Residential Buildings Operations			
Intent: To incentive the co renewa	nsumption and producti ble energy	ion of	
Indicator	Unit of Measu	re !	
Total consumption of primary energy generated from renewable sources on-site % divided by total primary energy consumption of residential buildings			
Assessment Methodolo	gy:	1	
<ol> <li>Calculate the annual total primary energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each residential building in the local area including renewables, if applicable, in the existing condition.</li> <li>Calculate the aggregated annual total primary energy consumption for residential buildings.</li> <li>Calculate the annual total primary energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each residential building in the local area without the installed renewables, if applicable.</li> <li>Calculate the aggregated annual total primary energy consumption without the renewables for residential buildings.</li> <li>Calculate the ratio:</li> </ol>			
Aggregated annual total primary energy consumption / Aggregated annual total primary energy consumption without the renewables.			
Standard: -	<b>Reference:</b> CESBA MED Project - S Assessment System	NTool	

$\langle \mathbf{f} \rangle$	B. Energy SNTO		
<b>B</b> 3	Re newable Energy		
B3.9	Share of R enewable Energy On- Site, On T otal Primary Energy Consumptions for Public Office/Educational Building Operations		
Intent: To incentive the consumption and production renewable energy			on of
Indicator		Unit of Measur	е
Total consumption of primary energy generated from renewable sources on-site divided by total primary energy consumption of public office/ educational buildings		%	
Assessment Methodology:			
<ol> <li>Calculate the annual total final electric energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each public office/educational building in the local area including renewables, if applicable, in the existing condition.</li> <li>Calculate the aggregated annual total primary energy</li> </ol>			

2. Calculate the aggregated annual total primary energy consumption for residential buildings.
3. Calculate the annual total final electric energy consumption for building operations (heating, cooling, domestic hot water and lighting), in kWh, for each public office/educational building in the local area without the installed renewables, if applicable.

**4.**Calculate the aggregated annual total final electric energy consumption without the renewables for public office/

educational buildings.

5.Calculate the ratio:

Aggregated annual total final electric energy consumption / Aggregated annual total final electric energy consumption without the renewables.

Standard:	Reference:
•	CESBA MED Project - SNTool Assessment System

![](_page_36_Picture_0.jpeg)

Description of the Information 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

6	C. Water		SN Tool
C1 Water Infrastructure C1. 2 Availability of Wastewater Treatment System			
Intent: To evaluate the neighborhood's health, cleaniliness and quality of life			
Indicate	or	Unit of Measur	e
Number of people within the neighborhood who are % served by a wastewater collection divided by the neighborhood's population.			
Assessment Methodology:			
<ol> <li>Calculate the number of people within the neighborhood who are served by a wastewater collection.         <ul> <li>(A) - numerator</li> </ul> </li> <li>Calculate the total population of the neighborhood.             <ul> <li>(B) - denominator</li> </ul> </li> <li>Calculate the value of the indicator as:</li></ol>			
Standard: ISO 37120: Sustainable Cities and Communities - Indicators for City Services and Quality of Life		for City	

C. Wa	ater snta	
C1 Water Infrastr C1. 1 Availability of a Supply	ructure a Public Municipal Water	
Intent: To evaluate the neighborhood's health and quality of life		
Indicator	Unit of Measure	
Number of people within the neighborhood who are served by a municipal water supply divided by the neighborhood's population.	%	
Assessment Methodol	ogy:	
<ol> <li>Calculate the number of per who are served by a municipa (A) - nu</li> <li>Calculate the test of a served by</li> </ol>	eople within the neighborhood al water supply. umerator	
<ol> <li>Calculate the total population of the neighborhood. (B) - denominator</li> <li>Calculate the value of the indicator as: =A/B (%)</li> </ol>		
Standard, Rofo		
ISO 3 and C Servic	rence: 7120: Sustainable Cities Communities - Indicators for Cit tes and Quality of Life	
- ISO 3 and C Servic	rence: 7120: Sustainable Cities Communities - Indicators for City ies and Quality of Life	
C2 Water Consum C2. 1 Total Water Con	rence: 7120: Sustainable Cities Communities - Indicators for City ies and Quality of Life ater SN Ta nption	
C. Water Consum C2. 1 Total Water Con	rence: 7120: Sustainable Cities Communities - Indicators for City ies and Quality of Life cater SNTA nption nsumption	
C. Water Consum C2 Water Consum C2. 1 Total Water Consum Intent: To evaluate the neighbo	rence: 7120: Sustainable Cities Communities - Indicators for City ises and Quality of Life SNTC ater SNTC Inption nsumption e water resources in the orhood.	
C. Water Consum C. Water Consum C2 Water Consum C2. 1 Total Water Consum Intent: To evaluate the neighbour	rence: 7120: Sustainable Cities Communities - Indicators for City ies and Quality of Life ater SNT nption nsumption e water resources in the orhood. Unit of Measure	
C. Water Consum C. Water Consum C2 Water Consum C2. 1 Total Water Consum Intent: To evaluate the neighborhood's water consumption in litres per day divided by the total neighborhood's population	rence: 7120: Sustainable Cities Communities - Indicators for City ises and Quality of Life cater SNTA mption nsumption e water resources in the orhood. Unit of Measure L/day/occupant	
C. Water Consum C. Water Consum C2 Water Consum C2. 1 Total Water Consum Intent: To evaluate the neighborhood's water consumption in litres per day divided by the total neighborhood's population Assessment Methodolo	rence: 7120: Sustainable Cities Communities - Indicators for City tes and Quality of Life atter switch mption nsumption e water resources in the orhood. Unit of Measure L/day/occupant	
C. Water Consum C. Water Consum C2 Water Consum C2. 1 Total Water Consum Intent: To evaluate the neighborhood's water consumption in litres per day divided by the total neighborhood's population Assessment Methodolo 1. Calculate the total amount consumption in litres per day.	rence: 7120: Sustainable Cities Communities - Indicators for Cit- tes and Quality of Life atter SNTA nption nsumption e water resources in the orhood. Unit of Measure L/day/occupant	
C. Wa C. Wa C. Wa C. Wa C. Wa C. Wa C2 Water Consum C2. 1 Total Water Consum Intent: To evaluate the neighborhood's water consumption in litres per day divided by the total neighborhood's water consumption in litres per day divided by the total neighborhood's population Assessment Methodolo 1. Calculate the total amount consumption in litres per day. (A) - m 2. Calculate the total population (B) - der 3. Calculate the value of the i	rence: 7120: Sustainable Cities communities - Indicators for Cit- tes and Quality of Life ater switch mption nsumption e water resources in the orhood. Unit of Measure L/day/occupant ogy: of the neighborhood's water umerator ion of the neighborhood. nominator indicator as:	
C. Wo Service C. Wo C2 Wa ter Consum C2 Wa ter Consum C2 Total Water Consum Intent: To evaluate the neighborhood's water consumption in litres per day divided by the total neighborhood's water consumption in litres per day divided by the total neighborhood's population Assessment Methodol 1. Calculate the total amount consumption in litres per day. (A) - m 2. Calculate the total population (B) - der 3. Calculate the value of the i	rence: 7120: Sustainable Cities communities - Indicators for Cit- tes and Quality of Life ater SNT mption nsumption e water resources in the orhood. Unit of Measure L/day/occupant Ogy: of the neighborhood's water umerator ion of the neighborhood. nominator indicator as: A/B	

C. Water SNTO				
C2 Water Consumption				
C2. 2 Efficiency in Wo	ater Use			
· · · · · · · · · · · · · · · · · · ·				
Intent: To make an efficie	ent use of water resourc	ces.		
Indicator Unit of Measure				
Volume of water supplied minus the volume of utilized water divided by the total volume of water supplied	%			
Assessment Methodol	ogy:			
1. Calculate the total volume	of water supplied in the	•		
(A) - ni 2. Calculate the volume of uti	umerator ilized water			
(B) - der	nominator			
	/B (%)			
Standard: Refe	rence: 2019 Edition-Calculatior	n		
<b>C</b> . We	ater	SN Tool		
C. Wo C2 Water Consur	ater nption	SN Tool		
C. Wa C2 Water Consur C2. 4 Consumption o Public Offices	ater nption f Potable Water in	SN Tool		
C. Wa C2 Water Consur C2. 4 Consumption of Public Offices Intent: To make an efficie	ater nption f Potable Water in ent use of water resource	SN Tool		
C. Wa C2 Water Consur C2. 4 Consumption of Public Offices Intent: To make an efficient Indicator	nption of Potable Water in ent use of water resource Unit of Measur	SN Tool ces		
C. Wo C2 Water Consur C2. 4 Consumption of Public Offices Intent: To make an efficient Indicator Annual potable water consumption per occupant	ater nption f Potable Water in ent use of water resource Unit of Measur L/occupant/year	SN Tool ces re		
C. Wo C2 Water Consur C2. 4 Consumption of Public Offices Intent: To make an efficient Indicator Annual potable water consumption per occupant	ater nption f Potable Water in ent use of water resource Unit of Measur L/occupant/year	SN Tool ces e		
C. We C2 Water Consur C2. 4 Consumption of Public Offices Intent: To make an efficient Indicator Annual potable water consumption per occupant Assessment Methodol 1. For each public office build annual potable water consum The consumption data must b	ater nption f Potable Water in ent use of water resource Unit of Measur L/occupant/year ogy: ling, collect the monitore uptions for building oper e estimated taking the c	SN Tool ces re ed ations. average		
C. We C2 Water Consur C2. 4 Consumption of Public Offices Intent: To make an efficient Indicator Annual potable water consumption per occupant Assessment Methodol 1. For each public office build annual potable water consum The consumption data must b over a 3 year period (litres). 2. Sum the annual potable water building up to an aggregated consumption (litres (vicer)	ater nption f Potable Water in ent use of water resource Unit of Measur L/occupant/year ogy: ling, collect the monitore aptions for building oper e estimated taking the co ater consumption of eac annual total potable wo	SN Tool ces ces ed rations. average h office ater		
C. We C2 We ter Consur C2. 4 Consumption of Public Offices Intent: To make an efficient Indicator Annual potable water consumption per occupant Assessment Methodol 1. For each public office build annual potable water consum The consumption data must be over a 3 year period (litres). 2. Sum the annual potable water boulding up to an aggregated consumption (litres/year). 3. Estimate the number of occ buildings. 4.Calculate the indicator as:	cater nption of Potable Water in ent use of water resource Unit of Measur L/occupant/year ogy: ling, collect the monitore uptions for building oper e estimated taking the consumption of eac annual total potable wo cupants in the public officient	SN Tool		
C. We C2 Wa ter Consur C2. 4 Consumption of Public Offices Intent: To make an efficient Indicator Annual potable water consumption per occupant Assessment Methodol I. For each public office build annual potable water consum The consumption data must be over a 3 year period (litres). 2. Sum the annual potable water consumption (litres/year). 3. Estimate the number of occup ouildings. 4.Calculate the indicator as: Aggregated annual total po Number of	ater nption f Potable Water in ent use of water resource Unit of Measur L/occupant/year ogy: ling, collect the monitore uptions for building oper e estimated taking the c ater consumption of eac annual total potable water cupants in the public offic potable water consumption f occupants	SN Tool ces re ed rations. average th office ater ice on /		

Assessment System

SNTool MED

![](_page_36_Picture_7.jpeg)

	C. We	SN Tool		
C2 Water Consumption C2. 6 Re-Usage of Rainwater in Residential Buildings				
Intent: To assess the collection of rainwater from roofs in residential buildings				
I	Indicator	Unit of Measur	е	
I Sho I colled I reside	are of rainwater cted from roofs of ential buildings for reutilization	%		
Assessment Methodology:				
<ol> <li>Calculate the volume of rainwater collected in the neighborhood.</li> </ol>				
(A) - Numerator 2. Calculate the volume of greywater used for toilets and irrigation in residential buildings in the neighborhood. (B) - Denominator			ets	
<b>3.</b> Calculate the value ot the indicator as: A/B (%)				
Standa	rd: Refe	rence:		
CESBA MED Project - SNTcol Assessment System				

	$\mathbf{O}$	C. Water		SN Tool
	C2 Water Consumption			
	C2. 8	Solar-Powered	Water Desalinizatio	n
	Intent: To a to reduce saline wa	alleviate water stress, production cost for i ter in o rder t o rer consumption and	maximize the use of solar removing s alts from brack nder i t acceptable for h d/or agriculature.	energy kish o r numan
	Ir	ndicator	Unit of Measur	е
	Perce accept consump from so	entage of water table for human ption or agriculture lar-desalinization	%	
	Assess	ment Methodol	ogy:	
ר פ i	To perform estimated o indirect (elo	the calculation, it is data for producing fre ectrical) solar-desalin	possible to use metered o esh water from direct (the ation systems.	r rmal) or
	1.Calculate desalinizat 2.Calculate city (B). 3.Calculate average an water cons	e the annual water pr ion facilities (m <sup>3</sup> /year e the annual total wo e the value of the indi nnual w ater p roduct umption (%) as:	roduction from all solar- ) serving the city (A). tter consumption (m <sup>3</sup> /yea icator as a percentage rati ion divided by the annu	r) of the io of the val t otal
			4/В	
2	Standarc	I: -WHO/HSE/ - WHO/HSE/ - from Desalin - Directive [EL -EurEau 202]	: WSH/11.03 Safe Drinking ization,2011. J) 2020/2184 I. Europe's Water i <u>n Figur</u>	Water res

![](_page_37_Figure_2.jpeg)

C. Water SN Too C3 Effluents Management Public Wastewater (from Outdoor C3. 2 Areas) that is Disposed or Treated Intent: To reduce the incidence of a variety of waterborne diseases. Indicator Unit of Measure Percentage of public wastewater that is % disposed or treated **Assessment Methodology:** 1.Calculate the total volume of public wastewater from outdoor areas disposed or treated in the neighborhood. (A)-Numerator 2.Calculate the total volume of public wastewater produced from outdoor areas in the neighborhood. (B)-Denominator 3.Calculate the indicator: A/B (%) Reference: Standard: UNECE.Collection Methodology for Key Performance Indicators for Smart Sustainable Cities

C. Water SNTG			
C3 Effluents Management			
C3. 3 Household Sanitation			
Intent: To maintain basic hygiene levels in households.			
Indicator	Unit of Measur	e	
Percentage of households with access to basic % sanitation facilities			
Assessment Methodo	ology:	       	
<ol> <li>Calculate the total number of neighborhood households with access to basic sanitation and facilities.</li> <li>(A) Numerator</li> </ol>			
(A)-INUMERATOR <b>2.</b> Calculate the total number of neighborhood households. (B)-Denominator			
<b>3.</b> Calculate the indicator as: A/B (%)			
Standard: Ref	erence: -CE-Collection Methodolog	v for	

Key Performance Indicators for Smar Sustainable Cities

# D.Solid Waste

	D
Description of the Information	D1.1
D: Issue	
Dx: Category	Inte
D1: Solid Waste Collection	
D2: Solid Waste Management	1
g	F
Dx.x: Criterion	l pop
<b>Intent:</b> Description of the objective of the criterion	
<b>Indicator:</b> Name of the indicator to be calculated	Asso
Unit of Measure: Measuring unit of each indicator	that ar
<b>Standard:</b> The calculation standard for the criterion	neighb
<b>References:</b> The acquiring source of information	<b>3.</b> Calc
★ Key Performance Indicator	Stand

D. So	lid Waste	SN Tool	4	
D2 Solid Wast		C		
D2. 1 Access to Solid Waste and Recycling Collection Points				
Intent: To assess the pr households and non-r nearby collection poin	roportion of potential esidential users with ts for solid waste and	residential access to recycling.	Inter	
Indicator	Unit of Me	asure	 	
Proximity of the resident population to the solid % waste and recycling collection points			Pe with an poi	
Assessment Methodology:				
<ol> <li>Identify the ecological areas or individual bins for differentiated collection of waste present in the neighborhood.</li> </ol>				
<b>2.</b> Calculate the actual distance on foot between these nodes and the accesses of the buildings.			<b>2.</b> Ca	
<b>3.</b> Calculate the percentage of the population that is located more than 50 meters from the waste collection points, compared to the main entrances of the buildings.			<b>3.</b> Ca	
Standard: F - A	Reference: CESBA MED Project-SNTo Assessment System.	ol	Stan	

ł	D. Solid	Waste	SN Tool
D1 Solid	Waste C	ollection Infrastru	cture
D1.1 Avail	ability of S	Solid Waste Collect	ion
Intent: To evo	aluate the no quality	eighborhood's health v of life.	and
Indicat	or	Unit of Measu	re
Percentage population wit solid waste co	of the h regular ollection.	%	
Assessment	Methodolo	ogy:	
<ol> <li>Calculate the number of households in the neighborhood that are served by solid waste collection.</li> <li>(A) - numerator</li> <li>Calculate the total number of households in the</li> </ol>			
neighborhood. (B) - denominator			
<b>3.</b> Calculate the value of the indicator as: =A/B (%)			
Standard: –	<b>Refe</b> UNEC Key P Susta	rence: CE-Collection Methodolo erformance Indicators fo inable Cities.	gies for r Smart
ł	D. Solid	Waste	SN Too
D2 Solid D2.2 Acces Colle	Waste M ss to Solid ction Poin	anagement Waste and Recyclii ts	ng
Intent: To impro	ve separate to burr	collection disposal, av waste.	voiding
1.12			

Indicator	Unit of Measure
Percentage inhabitants with access to solid waste and recycling collection points within 400 meters of walking distance.	%
Assessment Methodolo	ogy:
<ol> <li>Calculate the share of inha distance to the solid waste an the neighborhood.</li> <li>(A) - no</li> </ol>	bitants living with 400 meters d recylcing collection points in umerator
<ol> <li>Calculate the total populat (B) - der</li> </ol>	ion of the neighborhood. nominator
<b>3.</b> Calculate the value of the i =A/	ndicator as: /B (%)
Standard: Refe	rence: E-Collection Methodologies for

Key Performance Indicate Sustainable Cities.	ors for Smart
	SNTool MED

# **E.**Environmental Quality

**Description of the Information** E: Issue **Ex**:Category E1: Air Quality E2: Noise E3: EMF Exposure **E4: Environmental Impacts 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. Environmental Quality 23 SN Tool **E**1 Air Quality **★**E1.2 Particulate Matter (PM 10) Concentration Intent: To assess the long-term ambient air quality with respect to particulates <10mu (PM10) in the neighborhood. Indicator Unit of Measure Number of days within a Days/Year year that PM<sub>10</sub> concentration exceeds the daily limit. **Assessment Methodology:** 1. Daily test air samples in accordance with national or regional procedures over a period time of one year. 2. Evaluate the number of days exceeding the daily limits in a year. Note: For further information on the calculation steps go to the KPIs Anex. **Reference:** Standard: CESBA MED Project - SNTool Assessment System. 78

12	E. Environme	ental Quality	SN Tool
E1	Air Quality		
E1. 1	Fine Particulate	Matter (PM <sub>2.5</sub> ) Concentro	ition
Intent:	To evaluate the c exceeded daily	juality of the air throug limits of pollutants.	h the
	Indicator	Unit of Measur	е
Numb	per of days within a year that PM 2.5 ntration exceeds the daily limit.	%	
Asse	ssment Methodo	logy:	
<ol> <li>Select according</li> </ol>	t the number of day ng to the following o	s per year with a bad air o riteria:	quality
	D2: Number of day: CO: Number of day: IOx: Number of day D3: Number of days M10: Number of da	with more than 125 $\mu$ g/r with more than 10 mg/m s with more than 50 $\mu$ g/m with more than 120 $\mu$ g/m ys with more than 50 $\mu$ g/r	m <sup>3</sup> 1 <sup>3</sup> 1 <sup>3</sup> 1 <sup>3</sup> m <sup>3</sup>
Standa	ird: Rei _ CES _ Ass	erence: BA MED Project - SNTool essment System.	
J.	E. Environme	ental Quality	SN Tool
5 E1	E. Environmo	ental Quality	SN Tool
E1 E1.3	E. Environme Air Quality Nitrogen Dioxid	ental Quality e Concentration (NO <sub>2</sub> )	SN Tool
E1 E1.3	E. Environme Air Quality Nitrogen Dioxid	ental Quality e Concentration (NO <sub>2</sub> ) quality of the air throug its of pollutants (NO <sub>2</sub> ).	SN Tool h the
E1 E1.3 Intent:	E. Environme Air Quality Nitrogen Dioxid To evaluate the o exceeded daily lim	ental Quality e Concentration (NO <sub>2</sub> ) quality of the air throug its of pollutants (NO <sub>2</sub> ). Unit of Measur	SN Tool h the
E1 E1.3 Intent: Numb concer	E. Environme Air Quality Nitrogen Dioxid To evaluate the of exceeded daily lime Indicator oper of days within a year that NO <sub>2</sub> ntration exceeds the daily limit.	ental Quality e Concentration (NO <sub>2</sub> ) quality of the air throug its of pollutants (NO <sub>2</sub> ). Unit of Measur μg/m <sup>3</sup>	SN Tool h the
E1 E1.3 Intent: Numb concer	E. Environme Air Quality Nitrogen Dioxid To evaluate the of exceeded daily lim Indicator Deer of days within a year that NO <sub>2</sub> intration exceeds the daily limit.	ental Quality e Concentration (NO <sub>2</sub> ) quality of the air throug its of pollutants (NO <sub>2</sub> ). Unit of Measur μg/m <sup>3</sup>	SN Tool h the
E1 E1.3 Intent: Numb concer Assee 1. Cal	E. Environme Air Quality Nitrogen Dioxid To evaluate the of exceeded daily lime Indicator oper of days within a year that NO <sub>2</sub> nitration exceeds the daily limit.	ental Quality e Concentration (NO <sub>2</sub> ) quality of the air throug its of pollutants (NO <sub>2</sub> ). Unit of Measur μg/m <sup>3</sup>	SN Tool h the e
E1 E1.3 Intent: Numb concer Asset 1. Cal 2. Cal meters	E. Environme Air Quality Nitrogen Dioxid To evaluate the of exceeded daily lim Indicator Der of days within a year that NO <sub>2</sub> intration exceeds the daily limit. Ssment Methodo foulate the mass of p (A)- culate the volume of s µg/m <sup>3</sup> .	ental Quality e Concentration (NO <sub>2</sub> ) quality of the air throug its of pollutants (NO <sub>2</sub> ). Unit of Measur μg/m <sup>3</sup>	SN Tool h the e g).
E1 E1.3 Intent: Numb concer Asser 1. Cal 2. Cal meters 3. The in micr	E. Environme Air Quality Nitrogen Dioxid To evaluate the of exceeded daily lim Indicator Deer of days within a year that NO <sub>2</sub> nitration exceeds the daily limit. Ssment Methodo culate the mass of (A)- culate the volume of s µg/m <sup>3</sup> . (B)-D result shall be expre	ental Quality e Concentration (NO <sub>2</sub> ) quality of the air throug its of pollutants (NO <sub>2</sub> ). Unit of Measur μg/m <sup>3</sup> Nogy: pollutant collected NO <sub>2</sub> (μg Numerator air sampled in standard cut penominator ssed as the concentration of I cubic meters. μg/m <sup>3</sup>	SN Tool h the e g). bic
E1 E1.3 Intent: Numb concer Asser 1. Cal 2. Cal meters 3. The in micr	E. Environme Air Quality Nitrogen Dioxid To evaluate the of exceeded daily lim Indicator Der of days within a year that NO <sub>2</sub> Intration exceeds the daily limit. Ssment Methodo foulate the mass of ( (A)- culate the volume of s µg/m <sup>3</sup> . (B)-D result shall be expre rograms per standard	ental Quality e Concentration (NO <sub>2</sub> ) quality of the air throug its of pollutants (NO <sub>2</sub> ). Unit of Measur μg/m <sup>3</sup> Unit of Measur μg/m <sup>3</sup> Unit of Measur μg/m <sup>3</sup> Unit of Measur μg/m <sup>3</sup>	SN Tool h the e g). bic

12	E. Environmer	ntal Quality	SN Tool
E1	Air Quality		
E1.4	Sulfur Dioxide Co	ncentration (SO $_2$ )	
Intent:	To evaluate the que exceeded daily limit	ality of the air throug s of pollutants (SO <sub>2</sub> ).	h the
	Indicator	Unit of Measur	e ¦
Num conce	ber of days within a year that SO <sub>2</sub> ntration exceeds the daily limit.	µg/m³	
Asse	ssment Methodolo	ogy:	
<ol> <li>Calcumeters</li> <li>The rain micro</li> </ol>	late the mass of pollut (A)-Nu late the volume of air (μg/m <sup>3</sup> ). (B)-Den esult shall be expresse ograms per standard c μg	tants collected SO <sub>2</sub> (μg), imerator sampled in standard cul ominator d as the concentration o ubic meter. g/m <sup>3</sup>	.   bic   f SO <sub>2</sub>       
Stando	ird: Refe UNEC Key P Sustai	rence: CE - Collection Methodolog erformance Indicators for inchle Cities	gy for Smart
1	E. Environmer	ntal Quality	SN Tool
<b>E</b> 2	E. Environmer Noise	ntal Quality	SN Tool
E2 E2. 1	E. Environmer Noise Ambient Daytime	ntal Quality Noise Conditions	SN Tool
E2 E2. 1 Intent:	E. Environmen Noise Ambient Daytime To promote acoustic safe env	ntal Quality Noise Conditions comfort, for a health, ironment	SN Tool
E2 E2. 1 Intent:	E. Environmer Noise Ambient Daytime To promote acoustic safe env Indicator	ntal Quality Noise Conditions comfort, for a health ironment Unit of Measur	SN Tool
E2 E2. 1 Intent: Perc	E. Environmen Noise Ambient Daytime To promote acoustic safe env Indicator tentage of building a over noise limit.	ntal Quality Noise Conditions comfort, for a health, ironment Unit of Measur %	SN Tool
E2 E2. 1 Intent: Perc are Asse	E. Environmen Noise Ambient Daytime To promote acoustic safe env Indicator eentage of building a over noise limit.	ntal Quality Noise Conditions comfort, for a health, ironment Unit of Measur %	SN Tool
E2 E2. 1 Intent: Perc are Asse 1. Ca neigi level	E. Environmen Noise Ambient Daytime To promote acoustic safe env Indicator eentage of building a over noise limit.	ntal Quality Noise Conditions comfort, for a health, ironment Unit of Measur % Dgy: f people living in the ve ambient daytime nois merator	SN Tool
E2 E2. 1 Intent: Perc are Asse 1. Co neigi level 2. Co neigi	E. Environmen Noise Ambient Daytime To promote acoustic safe env Indicator entage of building a over noise limit. essment Methodold alculate the number of aborhood with excessions. (A)-Num alculate the total number	ntal Quality Noise Conditions Comfort, for a health, ironment Unit of Measur % Dgy: f people living in the ve ambient daytime nois merator ber of people living in the	SN Tool
E2 E2. 1 E2. 1 Intent: Perc are Asse 1. Co neigi level 2. Co neigi 3. Co	E. Environmen Noise Ambient Daytime To promote acoustic safe env Indicator entage of building a over noise limit. essment Methodolo borhood with excessions. (A)-Nut alculate the number of borhood. (B)- Denvi alculate the indicator of A/B	ntal Quality Noise Conditions comfort, for a health, ironment Unit of Measur % Dgy: f people living in the ve ambient daytime nois merator ber of people living in th ominator as: f (%)	SN Tool

Assessment System.

SNTool MED

SNTool MED

E. Environmer	ntal Quality	SN Tool
E1 Air Quality		
E1.5 Ozone Concentra	tion (O <sub>3</sub> )	
Intent: To evaluate the qu exceeded daily limi	ality of the air throug ts of pollutants (O <sub>3</sub> ).	h the
Indicator	Unit of Measur	e
Number of days within a year that O <sub>3</sub> concentration exceeds the daily limit.	µg/m³	
Assessment Methodolo	ogy:	
<ol> <li>Calculate the mass of pollu (A)-Nu (A)-Nu</li> <li>Calculate the volume of air meters (μg/m<sup>3</sup>).</li> <li>(B)-Den</li> <li>The results shall be express</li> </ol>	utants collected O <sub>3</sub> (μg). umerator r sampled in standard cu nominator sed as the concentration	ubic I of O3
in micrograms per standard c (μg	ubic meter <b>.</b> /m <sup>3</sup> )	
Standard: Refe UNEC Key P Susta	rence: CE-Collection Methodolog erformance Indicators for inclus Citics	y for Smart
E. Environmer	ntal Quality	SN Tool
E. Environmer E2 Noise	ntal Quality	SN Tool
E. Environmer E2 Noise E2. 2 Ambient Night-Tir	ntal Quality ne Noise Conditions	SN Tool
E. Environmen E2 Noise E2. 2 Ambient Night-Tir Intent: To promote acoustic safe env	ntal Quality ne Noise Conditions comfort, for a health; ironment.	SN Tool
E. Environmen E2 Noise E2. 2 Ambient Night-Tin Intent: To promote acoustic safe env Indicator	ntal Quality me Noise Conditions comfort, for a healthy ironment. Unit of Measur	SN Tool
E. Environmen E. Noise E. 2 Noise E. 2 Ambient Night-Tin Intent: To promote acoustic safe env Indicator Percentage of building area over noise limit	ntal Quality ne Noise Conditions comfort, for a healthy ironment. Unit of Measur %	SN Tool
E. Environment E2 Noise E2. 2 Ambient Night-Time Intent: To promote acousting safe environment Indicator Percentage of building area over noise limit Assessment Methodolo Estimated percentage of total neighborhood that is exposed 40dBA during periods from 22	ntal Quality ne Noise Conditions c comfort, for a healthy ironment. Unit of Measur % Dgy: residential population in t to ambient noise exceedin 2:00 to 7:00.	SN Tool
E. Environmen E2 Noise E2 2 Ambient Night-Tin E2 2 Ambient Night-Tin Intent: To promote acoustic safe env Indicator Percentage of building area over noise limit Assessment Methodolo Estimated percentage of total neighborhood that is exposed 40dBA during periods from 22 1.Calculate the number of per that is exposed to ambient noise periods from 22:00 to 7:00.	ntal Quality ne Noise Conditions c comfort, for a healthy ironment. Unit of Measur % Dgy: residential population in t to ambient noise exceedin 2:00 to 7:00. pple living in the neighbor ise exceeding 40dBA durin umerator	SN Tool
E. Environment E2 Noise E2 Noise E2 2 Ambient Night-Time Intent: To promote acoustic safe environ Indicator Percentage of building area over noise limit Assessment Methodolo Estimated percentage of total neighborhood that is exposed 40dBA during periods from 22 1.Calculate the number of per- that is exposed to ambient nois periods from 22:00 to 7:00. (A)- No	ntal Quality ne Noise Conditions c comfort, for a healthy ironment. Unit of Measur % Ogy: residential population in t to ambient noise exceedin 2:00 to 7:00. ople living in the neighbor ise exceeding 40dBA durir umerator of people living in that ominator	SN Tool
E. Environment E2 Noise E2 Noise E2. 2 Ambient Night-Tim Intent: To promote acoustic safe environ Indicator Percentage of building area over noise limit Assessment Methodolo Estimated percentage of total neighborhood that is exposed 40dBA during periods from 22 1.Calculate the number of periods from 22:00 to 7:00. (A) Noise	ntal Quality ne Noise Conditions comfort, for a healthy ironment. Unit of Measur % Dgy: residential population in t to ambient noise exceedin 2:00 to 7:00. pple living in the neighbor ise exceeding 40dBA durir umerator of people living in that iominator B (%)	SN Tool

79

![](_page_40_Figure_0.jpeg)

![](_page_40_Figure_1.jpeg)

CESBA MED Project - SNTool Assessment System. E. Environmental Quality

Exposure to High Frequency Electromagnetic

Intent: To assess the quantity of buildings exposed to ELF

magnetic fields.

1. Calculate the number of buildings located in the neigh-

(A)-Numerator

(B)-Denominator

A/B (%)

**Reference:** 

Sustainable Cities

UNECE-Collection Methodology for Key Performance Indicators for Smart

borhood not respecting the safety distance from high

2. Calculate the total number of buildings in the

. . . . . . . . . . . . . . . . . .

**Unit of Measure** 

%

12

E3. 2

E3 Air Quality

Fields

Indicator

Percentage of buildings in

the neighborhood, located

not respecting the safety distance from high voltage

lines.

voltage lines.

neighborhood.

Standard:

**Assessment Methodology:** 

3. Calculate the value of the indicator:

SN Tool

# F. Transportation & Mobility

Description of the Information F: Issue FX :Category F1: Performance of Mobility Services F2: Green Mobility F3: Safety in Mobility F4: Urban Morphology & Transportation 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

<b>F</b> A	F. Transpo & Mot	ortation pility	SN Tool
F1	Performance o	of Mobility Services	I
F1. 2	Walking Distance Workers and Stud	to Public Transport for ents	Area   
Intent	: To determine the p transportat	performance of the pub tion system.	lic I
Ir	ndicator	Unit of Measur	e
Percenta studen 400 distanc public	ge of workers and ts that are within meters walking te of at least one transportation service.	%	
Assess	ment Methodolo	ogy:	i
<ol> <li>Calcute</li> <li>the area</li> <li>at least of metro)</li> </ol>	late the percentage that are within 400 one public transport	of workers and students meters walking distanc ation service stop (bus, t	s in 1 e of 1 tram, 1
Note: To must ha trips.	be considered valic ve a daily total servi	l for the calculation, a si ce frequency of at least	iop 1 20 1
For the o students	calculation of the inc and working people	dicator are considered o e in the neighborhood.	nly I I
<b>Standard</b> Global Pla Cities - Url Frame	<b>1:</b> tform for Sustainable ban Sustainability 	Reference: CESBA MED Project - S Assessment System.	SNTool

<b>F</b> A	F. Transpo & Mot	ortation bility	SN Tool
F1	Performance o	f Mobility Services	; ,
<b>₹</b> F1. 1	Performance of th	e Public Transport Syst	em I
Intent	: To determine the <sub>I</sub> transportat	performance of the pub ion system.	olic I
Ir	ndicator	Unit of Measur	'e I
Percente that are walking one put	age of inhabitants within 400 meters distance of at lesat olic transportation ervice stop.	%	; ; ;
Assess	ment Methodolo	ogy:	ļ
<ol> <li>Locate total ser neighbo</li> <li>Locate with a withe locat</li> <li>Calcul</li> <li>Calcul</li> <li>Calcul</li> <li>Calcul</li> <li>occupan</li> <li>tion of the</li> </ol>	e the public/municip vice frequency of at rhood. all the residential bu alking distance from t ed stops up to 400 m late the occupants of ate the total popula ate the indicator's v ts of the selected bu he neighborhoood.	al transport stops with a least 20trips, that serve ildings in the neighborho heir entrance to at least a eters. of the selected buildings tion of the neighborhoo alue as the percentage ildings to the total popu	daily the one of
Note: Fo to the Kl	or further informatio Pls Anex.	n on the calculation ste	ps go I I
<b>Standard</b> Global Pla Cities - Url Frame	<b>1:</b> tform for Sustainable ban Sustainability	Reference: CESBA MED Project - Assessment System.	SNTool
G	F. Transpo & Mot	ortation bility	SN Tool

	& IV(OL	ринту
F2	Green Mobility	/
F2. 1	Shared Vehicles	
Intent: To	o promote an altern	ative form of transportation.
Ir	ndicator	Unit of Measure
Number per 1.0	of shared vehicles 000 inhabitants.	N/1000 Inhabitants
Assess	ment Methodolo	ogy:
1. Calcu	late the number of s	shared vehicles.
2 Calaul	(A)- NU A)- NU	merator
populatio	on.	the heighborhood s
	(B)-Den	ominator
3. Calcu	late the indicator as	:
	A	/B

Standard: - Reference: UNECE-Collection Methodology for Key Performance Indicators for Smart Sustainable Cities.

6	F. Transpo & Mot	ortation bility	SN Tool
F2	Green Mobility	/	
F2. 2	Electric-Vehicle In	frastructure (Charging	Station)
Inte	nt: To promote the	use of electric vehicles	
Ir	ndicator	Unit of Measur	e
Electric station	vehicle's charging is per inhabitant	N/Inhabitants	
Assess 1. Calcu vehicles. 2. Calcul 3. Calcu	Ment Methodolo late the number of (A)- Nu late the neighborhoo (B)-Den late the indicator as	pgy: charging stations for ele umerator d's population. ominator :: //B	ctric
Standard	d: Re CES Ass	ference: SBA MED Project - SNT∞l essment System.	
6	F. Transpo & Mob	ortation vility	SN Tool

F2	Green Mobility	/
F2. 4	Shared Vehicles	
Intent: To	o emphazise the us reduce traffic conge	e of bicycles as a method to estion and pollution.
Ir	ndicator	Unit of Measure
Number per 1.0	of shared bicycles 000 inhabitants.	N/1000 Inhabitants
Assess	ment Methodolo	ogy:
1. Calcu	late the number of s (A)- Nu	shared bicycles available. Imerator
<b>2.</b> Calcu populatio	late the one 1.000 of on.	the neighborhood's
	(B)-Den	ominator
3. Calcu	late the indicator as	
	A	VB

Standard:	Reference:
	UNECE.Collection Methodology fo
-	Key Performance Indicators for
	Smart Sustainable Cities.
SNTool MED	

6	F. Transp & Mol	ortation oility	SN Tool
F2	Green Mobilit	у	
<b>★</b> F2. 3	Bicycle Netwo	ork	
Intent: To re	emphazise the us educe traffic cong	e of bicycles as a methestion and pollution.	nod to
In	dicator	Unit of Measur	e
Total le paths in t per	ength of bicycle he neighborhood inhabitant.	m/inhabitants	
Assessi	ment Methodolo	ogy:	l
<ol> <li>Calcul neighbor</li> </ol>	ate the total length hood.	n of bicycle paths/lanes i	n the
<b>2.</b> Estimatine	(A)- Ni te/calculate the tota nood.	umerator I number of inhabitants in	ı the
3. Calcul	(B)-Der ate the indicator a:	nominator s:	
	,	A/B	l
	L Ut Ke Sn	NECE.Collection Methodo y Performance Indicators nart Sustainable Cities.	logy for for
	F. Transpo	ortation	SN Tool
	F. Transpo & Mot	ortation oility	SN Tool
F2 F2. 5	F. Transpo & Mok Green Mobility Availability of Bio	ortation bility / cycle Parking Facilities	SN Tool
F2 F2. 5 Intent: To p	F. Transpe & Mok Green Mobility Availability of Bio promote cycling as viding a safe and e	ortation bility ycle Parking Facilities an alternative to vehicle efficient mobility networ	SN Tool
F2 F2. 5 Intent: To by prov	F. Transpo & Mok Green Mobility Availability of Bio promote cycling as viding a safe and o dicator	ortation bility ycle Parking Facilities an alternative to vehicle efficient mobility networ Unit of Measure	SN Tool
F2 F2. 5 Intent: To j by prov	F. Transpe & Mok Green Mobility Availability of Bio promote cycling as viding a safe and a dicator arking spaces per shabitant	ortation bility cycle Parking Facilities an alternative to vehicle efficient mobility network Unit of Measure N/Inhabitants	SN Tool
F2 F2. 5 Intent: To j by prov	F. Transpo & Mok Green Mobility Availability of Bid promote cycling as viding a safe and a dicator urking spaces per shabitant	ortation bility cycle Parking Facilities an alternative to vehicle efficient mobility netwoor Unit of Measure N/Inhabitants	SN Tool
F2 F2. 5 F2. 5 Intent: To f by prov Intent: To f by prov Intent: To f the second the neight	F. Transpe & Mok Green Mobility Availability of Bia promote cycling as viding a safe and a dicator arking spaces per shabitant ment Methodolo ate the number of borhood.	cycle Parking Facilities an alternative to vehicle officient mobility network Unit of Measure N/Inhabitants	SN Tool
F2 F2. 5 F2. 5 Intent: To f by prov Intent: To f by prov Intent: To f by construction Bicycle pot intent: Assessor 1. Calcula the neigh 2. Calcula	F. Transpo & Mok Green Mobility Availability of Bia promote cycling as viding a safe and a dicator arking spaces per shabitant ment Methodolo ate the number of borhood. (A)- Nu ite the neighborhood (B)-Den	ortation bility cycle Parking Facilities an alternative to vehicle efficient mobility network Unit of Measure N/Inhabitants ogy: bicycles parking available prmerator d's population. ominator	SN Tool
F2 F2. 5 F2. 5 Intent: To j by prov Intent: To j by prov Intent: To j by converse for the second the neigh 2. Calcula 3. Calcula	F. Transpo & Mok Green Mobility Availability of Bio promote cycling as viding a safe and a dicator arking spaces per shabitant ment Methodolo ate the number of l borhood. (A)- Nu (B)-Den ate the neighborhood (B)-Den ate the indicator as	Dility         Scycle Parking Facilities         Stan alternative to vehicle         efficient mobility network         Unit of Measure         N/Inhabitants         Pgy:         bicycles parking available         umerator         d's population.         ominator         ::         //B	SN Tool
F2 F2.5 F2.5 Intent: To j by prov Intent: To j Bicycle po in I. Calcula the neigh 3. Calcula 3. Calcula	F. Transpe & Mok Green Mobility Availability of Bio promote cycling as viding a safe and a dicator arking spaces per shabitant ment Methodolo (A)- Nu (A)- Nu (B)-Den ate the neighborhoo (B)-Den ate the indicator as A	cycle Parking Facilities an alternative to vehicle efficient mobility network Unit of Measure N/Inhabitants ogy: bicycles parking available umerator d's population. ominator :: /B	SN Tool

83

![](_page_42_Figure_0.jpeg)

<b>F</b> A	F. Transportation & Mobility		SN Tool
F3	Safety in Mobi	lity	
F3. 3	F3. 3 Safety of bicycle lines		
Intent: To promote the use of the bicycle as an alternative vehicle from the private car.			
In	dicator	Unit of Measur	е
Percentage of bicycle paths physically separated from % traffic roads.			
Assess	ment Methodolo	ogy:	
1. Calculate the length of the bicycle paths physically separated from traffic roads.			
<b>2.</b> Calculate the total length of bicycle paths in the neighborhood.			
(B)-Denominator			
3. Calcul	ate the indicator as A/	 B(%)	
Standard: Reference: CESBA MED Project - SNTool Assessment System			

6	F. Transportation & Mobility		
<b>F</b> 3	Safety in Mobi	lity	
F3. 2	Availability of	Sidewalks	
Intent: To	o promote road con spatial ac	nectivity, as a key elen cessibility.	nent of
Ir	ndicator	Unit of Measu	re
Perce length t	ntage of road's hat has dedicated sidewalks.	%	
Assess	ment Methodolo	ogy:	
<ol> <li>Calcusidewalk</li> </ol>	late the roads lengt <s.< td=""><td>h that has dedicated</td><td></td></s.<>	h that has dedicated	
(A)- Numerator <b>2.</b> Calculate the total length of the roads in the neighborhood			
2 Calau	(B)-Den	ominator	
J. Calco	A/	а. В (%)	
Standard	d: Re _ CE _ As	e <b>ference:</b> SBA MED Project - SNTœ sessment System.	ы
	F. Transp	ortation	SN Tool
E2	& Mol		
	Satety in Mobi	шу	
F3.4 Traffic Fatalities			
Intent: To assess road safety			

FJ	Safety in Mobi	lity	
F3.4	3.4 Traffic Fatalities		
	Intent: To ass	ess road safety	
	ndicator	Unit of Measure	
Traffic f	atalities per 1.000 inhabitants	N/1.000 Inhabitants	
Asses	sment Methodolo	ogy:	
1. Calco	ulate the number of (A)- Nu	traffic fatalities. umerator	
<b>2.</b> Calcu populati	ulate one 1.000 inhab on.	itants of the neighborhood's	
	(B)-Den	ominator	
3. Calc	ulate the indicator as	:	
	A/	B(%)	
Standar	d: Re UN - Key Sm	ference: ECE-Collection Methodology for Performance Indicators for art Sustainable Cities.	

G	F. Transpo & Mol	F. Transportation & Mobility		
F4	Urban Morpho	ology & Transporta	tion	
F4.	Cyclomatic Cor Network	nplexity of the Stree	t	
Intent	Intent: To assess road connectivity as a key element of spatial accessibility.			
	Indicator	Unit of Measur	е	
	Cyclomatic Number	Number		
Ass	essment Methodolo	ogy:		
To assess this indicator, it is necesarry to add up all the road links and subtratc the number of intersections. Links-Nodes+1 For the calculation of the performance indicator proceed as follows:			the d as	
<ul> <li>Locate in the neighborhood the intersections (nodes N), and quantify them.</li> </ul>			les	
2. Find in the neighborhood segments between				
successive intersections, quantify them (sides L) <b>.</b> <b>3.</b> Apply the formula: L-N+1				
Stand	lard: Re	ference:		

Assessment System.

6	F. Transportation			
F4	Urban Morpho	ology & Transporte	ıtion	
F4. 2	Connectivity o	of the Street Netwo	ork	
Intent: To determine the connectivity of the local street network.				
h	ndicator	Unit of Measur	е	
Number of intersections related to the overall surface area.			_	
Assess	sment Methodolo	ogy:		
1. Calcu neighbo	<ol> <li>Calculate the number of streets intersections in the neighborhood.</li> </ol>			
	(A)- Numerator			
<b>2.</b> Calcu	2. Calculate the area of the neighborhood in Km <sup>2</sup> .			
(B)-Denominator				
	A	/В		
Standar	d: Re	eference:		

CESBA MED Project - SNTool Assessment System.

SNTool MED

# G.Social Aspects

**Description of the Information** 

### **G:** Issue

### **Gx**:Category

G1: Accessibility	G
(Disabled People)	G
G2: Housing	G
Private Facilities & Services	G
G4: Education	G
G5: Social Inclusion	

G6: Safety G7: Health G8: Food Security G9: Culture & Heritage G10: Perceptual

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. Social Aspects SN Tool			SN Tool
G1 Accessibil	ity (D	visabled People)	
G1.2 Sidewalks & Other Pedestrian Paths that are Accessible for Use by Physically Disabled People			
Intent: T o assess the ability of residents, workers or visitors with physical disabilities to be able to make use of public outdoor facilities in the neighborhood.			
Indicator		Unit of Measure	e
Percentage of sidewalks and other pedestrian ways that are accessible for use by physically disabled people Assessment Methodology:			
<ol> <li>Identify key pedestrian paths or other public routes that may be frequently used by people with physical disabilities.</li> </ol>			
2. Assess the accessibility of exterior parking and pedestrian access areas, considering all major disability types.			
<ol> <li>Establish the percentage of public pedestrian routes that may be considered accessible.</li> </ol>			
Standard:		Reference:	
		CESBA MED Project - S Assessment System	SNTool

![](_page_43_Picture_14.jpeg)

Indicator	Unit of Measure
Percentage of accessible public outdoor areas that are barrier-free compared to the total public area	%

### **Assessment Methodology:**

**1.** Identify key outdoor public facilities that may be frequently used by people with physical disabilities.

**2.** Assess the accessibility of pedestrians routes, considering all major disability types.

**3.** Establish the percentage of public outdoor facilities that may be considered accessible.

Standard: Reference: CESBA MED Project - SNTool Assessment System.

SN.	Tool	М	FD

İİİ	G. Social Aspects		
G2	Housing		
G2.1	Affordability of Ho	using Property	
Intent: T	o assess the afforda the neigh	bility of housing prop borhood.	erty in
1	ndicator	Unit of Measu	re
Housing properties in the neighborhood that are % financially accessible to the lowest quintile of area population.			
Asses	sment Methodolo	gy:	
1. Calco neighbo quintile	1. Calculate the number of housing properties in the neighborhood that are financially accessible to the lowest quintile of area population. (A)-Numerator		
<b>2.</b> Calcu neighbo	Jate the total number rhood. (B)-Den	ot housing properties in ominator	the
<b>3.</b> Calo	<ol> <li>Calculate the indicator as: A/B (%)</li> </ol>		
Standard: Reference: CESBA MED Project - SNTool Assessment System.		SNTool	
iii	G. Social /	Aspects	SN Tool

62	Housing
G2.3	Vacant Residential Units in the Neighborhood
Intent: T	o understand the current and future housing

needs in the neighborhood.

Indicator	Unit of Measure
Percentage of vacant residential units.	%

### **Assessment Methodology:**

![](_page_43_Figure_26.jpeg)

SNTool MED

![](_page_43_Figure_29.jpeg)

<sup>87</sup> 

![](_page_44_Picture_0.jpeg)

İİİ	G. Social Aspects SN Tool		
G3	Availability of Pub	lic, Private Facilities &	Services
G3.3	Availability and Pro School	ximity to a Public Secon	dary
Intent: To	o evaluate the perce a seconda	ntage of the population rry school.	n near
h	ndicator	Unit of Measur	'e

%

### **Assessment Methodology:**

1. Locate all the secondary schools present in the neighborhood. 2. Čalculate a 500 meter buffer zone for each primary

school located in the neighborhood. **3.**Calculate the number of buildings contained in each

buffer zone. **4.**Calculate the indicator as:

Total number of buildings located near a secondary school (500m) / Total number of buildings in the neighborhood.

### Standard:

**Reference:** ISO 37120: Sustainable Cities and Communities- Indicators for City Services and Quality of Life.

G. Social J	Aspects	SN Tool
G3 Availability of Publ	ic,Private Facilities & So	ervices
G3.2 Availability and Prop	kimity of a Public Primar	y Schoo
Intent: To evaluate the percent a primary	ntage of the population y school.	near
Indicator	Unit of Measur	e
Percentage of the population living within a 300 meter distance to a public primary school	%	
Assessment Methodolo	gy:	
<ol> <li>Locate all the primary sch neighborhood.</li> <li>Calculate a 300 meter bu school located in the neighborhood.</li> <li>Calculate the number of b buffer zone.</li> <li>Calculate the indicator as: Total number of buildings loc (300m) / Total number of buildings</li> </ol>	ools present in the ffer zone for each prime orhood. uildings contained in ec cated near a primary scl ildings in the neighborh	ıry ıch hool 10od.
Standard: R	eference:	
- Ci - Ci Se	ommunities- Indicators for ervices and Quality of Life	or City e.
G. Social J	Aspects	SN Tool
G3 Availability of Pub	lic, Private Facilities & S	Services
G3.4 Availability & Proxir Facilities	nity to Children's Play	
Intent: To evaluate the perce children's pl	ntage of the populatior ay facilities.	ı near
Indicator	Unit of Measur	е
Percentage of the population near a children's play facility.	%	
Assessment Methodolo	gy:	
<ol> <li>1. 1. Locate all the children's neighborhood.</li> <li>2. Calculate a 300 meter bu school located in the neighbi</li> <li>3. Calculate the number of bi buffer zone.</li> <li>4. Calculate the indicator as: Total number of buildings location</li> </ol>	s play facilities present i ffer zone for each prime orhood. uildings contained in ec ocated near a children's	n the ary ach play
facility (300m) / Total nu	umber of buildings in th	е

iii	G. Social /	Aspects	SN Tool
G3	Availability of Pub	lic,Private Facilities & S	ervices
G3.5 Outdoor Public Spaces			   
Intent: To local	ensure that public cultural value is pr	open space compatibl ovided in large project	e with s. I
Ir	ndicator	Unit of Measur	e ¦
Average share of the built-up area of the neighborhood that is open space for public use.     %			
Assess	ment Methodolo	gy: built-up area of the	
neigbon	(A)-Nu	merator	1
2. Calcul	ate the total area of t (B)-Den	he neighborhood. ominator	
<b>3.</b> Calculate the value of the indicator as: A/B (%)			
Standarc	l: -	Reference: CESBA MED Project - S Assessment System.	SNTool
iii	G. Social I	Aspects	SN Tool

TT	G. Social I	Aspects	SN Too
G4	Education		
G4.2	Rate of Female Scho	larship	
	Intent: To monito	r woman's rights	
h	ndicator	Unit of Measur	е
Ratio of female to male mean years of education received og population age 25+		%	
Assess	ment Methodolo	gy:	

ъ.

1. Calculate the number of female's average years of education received of population age 25+ in the

neighborhood. (A)-Numerator 2. Calculate the number of male's average years of education received of population age 25+ in the neighborhood.

(B)-Denominator 3. Calculate the value of the indicator as: Δ/R/%

SNTool MED

~, D( /0)	

Standard:	Reference:
	Sustainable Development in the Mediterranean Report.

Reference: ISO 37120: Sustainable Cities and Communities- Indicators for City

Services and Quality of Life.

Standard:

![](_page_44_Figure_20.jpeg)

<sup>89</sup> 

![](_page_45_Picture_0.jpeg)

### Assessment Methodology:

income below 60% of the national median income.

```
G. Social Aspects
                                                   SN Tool
  G5
         Social Inclusion
G5.1
         Energy Poverty of Households
            . . . . . . . . . . . . . . . . . . .
             Intent: To assess poverty risk.
       Indicator
                               Unit of Measure
 Percentage of households
 unable to afford the most
                                       %
   basic levels of energy
   (more than 10% of the
  income spent on energy
           bills)
 Assessment Methodology:
 1. Calculate the number of households unable to afford
 the most basic levels of energy (more than 10% of the
 income spent on energy bills)
 (A)-Numerator
2. Calculate the total number of households in the
 neighborhood.
                    (B)-Denominator
 3.Calculate the indicator as:
                        A/B(%)
                             Reference:
Standard:
              G. Social Aspects
                                                   SN Tool
  G6
         Safety
G6.1
         Police Service
Intent: To assess the overall crime prevention in place in
                  the neighborhood.
       Indicator
                               Unit of Measure
 Number of police officers
                              N/1.000 Inhabitants
   per 1.000 inhabitants.
```

### **Assessment Methodology:**

Standard:

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

SNTool MED

iii	G. Social I	Aspects	SN Too
G6	Safety		
G6.2	Fire Service		
Intent: To	o assess the overal place in the n	l fire security/prevent eighborhood <b>.</b>	'ion in
h	ndicator	Unit of Measu	re
Number 1.00	of firefigthers per 00 inhabitants	N/1.000 Inhabitan	ts
Assess 1. Calcu sworn-ir 2. Calcu population 3. Calcu	inter number of perm n firefigthers in the n (A)-Nu late one 1.000 of the on. (B)-Den late the value of the A	gy: nanent full-time or (FTE eighborhood. merator neighborhood's total ominator indicator as: /B	;)
Standard	: -	<b>Reference:</b> Sustainable Developm	nent in
		the Mediterranean Re	port.
iii	G. Social /	Aspects	SN Tool
G7	Health		
G7.1	In-Patient Hospital B	Beds	
Intent: 1	o monitor the level	of a health service de	livery.

Indicator	Unit of Measure
Number of in-patient public hospital beds per 1.000 inhabitants	N/1.000 Inhabitants

### Assessment Methodology:

<ol> <li>Calculate the total t (public and private)</li> <li>Calculate one 1.00 population.</li> <li>Calculate the indica</li> </ol>	number of in-patient hospital beds (A)-Numerator 0 of the neighborhood's 3)-Denominator tor as: A/B

UNECE - Collection Methodology

for Key Performance Indicators fo Smart Sustainable Cities

SNTool MED

	G.	Social A	Aspects	SN Tool
G6 So	afety			
G6.3 Po	pulatio	n Living in	Disaster Prone Areas	
Intent: To c significant r hazards	issess isk of c ; cycloi vol	population leath or d nes, droug canoes ar	ns living i n areas subj amage caused by pron ght, floods, earthquake nd landslides.	ect to ninent s,
Indi	icator		Unit of Measur	е I
Percentage living in a z natura	e of inho zone su Il hazar	abitants ibject to <sup>.</sup> ds.	%	
Assessme 1. Calculate tants living damage ca 2. Calculate population.	ent Mo e the to in area used by e the to	ethodolo otal numbe is subject t y prominen (A)-Nu otal numbe	egy: er of neighborhood inho to significant risk of dea nt hazards. merator er of the neighborhood's ominator	ıbi= th or s
<ol> <li>Calculate</li> </ol>	the ind	dicator as: A/I	B(%)	
Standard:		<b>Refere</b> UNECE Key Per Sustain	nce: - Collection Methodol formance Indicators fo able Smart Cities.	logy for pr
	G.	Social	Acporte	
		Social	Aspecis	SN Tool
G8 F	ood S	ecurity	Азресіз	SN Tool
G8 Fe G8.1 UI	ood S rban A	ecurity griculture	al Land	SN Tool
G8 Fe G8.1 Un Intent: To p agriculture projects	romote and al with th reutiliz	ecurity griculture inclusion lso plans ne goal of zation of u	al Land of areas devoted to of new u rban develop producing food throug urban resources.	sn tool urban oment yh
G8 Fe G8.1 Un Intent: To p agriculture projects	rond S rban A romote and al with th reutiliz	ecurity griculture inclusion lso plans ne goal of zation of u	al Land of areas devoted to of new u rban develop producing food throug urban resources. Unit of Measur	sn tool urban oment gh
G8.1 Un G8.1 Un Intent: To p agriculture projects Indi Area for urk land o neighbo	romote and al with th reutiliz	ecurity gricultura inclusion loo plans of goal of zation of u ricultural otal area.	al Land of areas devoted to of new urban develop producing food throug urban resources. Unit of Measur %	sn tool urban oment gh e
G8 Fe G8.1 Un Intent: To p agriculture projects Indi Area for urt land o neighbo	romote and al with th reutilizion cator oan agu n the to rhood o	ecurity gricultura inclusion so plans of a goal of zation of u ricultural otal area.	al Land of areas devoted to a of new u rban develop producing food throug urban resources. Unit of Measur %	e
G8 Fe G8.1 Un Intent: To p agriculture projects Indi Area for urk land o neighbo Assessme 1. Calculate used for foo boundaries	romote and al with th reutilizion cator oan agu n the to rhood of ent Ma e the to od proc	ecurity gricultura e inclusion lso plans of regoal of zation of u ricultural otal area. ethodolo btal design fuction loc	al Land of areas devoted to of new urban develop producing food throug urban resources. Unit of Measur % egy: ated urban agricultural ated within neighborho	sn tool urban oment gh e area od
G8 Fe G8.1 Un Intent: To p agriculture projects Indi Area for urk land o neighbo Assessme 1. Calculate used for foo boundaries 2. Calculate	romote and al with th reutilizion cator oan ago n the to rhood of ent Mo e the to od proc	ecurity gricultura e inclusion lso plans of regoal of zation of u ricultural otal area. ethodolo btal design duction loc (A)-Nu otal extensi	al Land of areas devoted to of new urban develop producing food throug urban resources. Unit of Measur % egy: ated urban agricultural ated within neighborhood merator ion of the neighborhood	sn tool urban oment gh e area od
G8 Fe G8.1 Un Intent: To p agriculture projects Indi Area for urk land o neighbo Assessmu 1. Calculate used for foc boundaries 2. Calculate area. 3.Calculate	romote and al with th reutiliz icator oan agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con agr n the to con a t	ecurity gricultura e inclusion les o plans o ne goal of zation of u ricultural otal area. ethodolo otal design duction loc (A)-Nu otal extensi (B)-Den dicator as: A/I	al Land of areas devoted to of new u rban develop producing food throug urban resources. Unit of Measur % PGY: ated urban agricultural ated within neighborhood ominator B(%)	e area od
G8 Fe G8.1 Un Intent: To p agriculture projects Indi Area for urk land o neighbo Assessme 1. Calculate used for foo boundaries 2. Calculate area. 3.Calculate	romote and al with th reutilizion cator oan agu n the to crhood ent Ma e the to od proc	ecurity gricultura e inclusion loo plans of the goal of zation of u ricultural otal area. ethodolo that design duction loc (A)-Nu otal extensi (B)-Den dicator as: A/l	al Land of areas devoted to of new u rban develop producing food throug urban resources. Unit of Measur % egy: ated urban agricultural ated within neighborhood ominator B(%) ence:	sn tool urban oment gh e area od
G8 Fe G8.1 Un Intent: To p agriculture projects Indi Area for urk land o neighbo Assessme 1. Calculate used for foo boundaries 2. Calculate area. 3.Calculate	romote and al with th reutilizion cator oan ago n the to rhood of ent Mo e the to od proc	ecurity gricultura e inclusion loo plans of the goal of zation of u ricultural otal area. ethodolo that design fuction loc (A)-Nu otal extensi (B)-Den dicator as: A/I Refer CESBA Assessi	al Land of areas devoted to of new urban develop producing food throug urban resources. Unit of Measur % egy: ated urban agricultural ated within neighborhood ominator ion of the neighborhood ominator B(%) ence: MED Project - SNTool ment System.	sn tool urban oment gh e d

![](_page_46_Picture_0.jpeg)

G. Social	Aspects SN Tool
G9 Culture and H	leritage
G9.2 Compatibility of Pu Cultural Values	blic Open Space with Local
Intent: To ensure that public local cultural values is p	c open space compatible with provided in large projects.
Indicator	Unit of Measure
Compatibility with local area traditional values of local public open spaces, including major uses, dimensions and adjacent uses.	Score
Assessment Methodolo	ogy:
Subjective qualita experienced third -p and/or	itive assessment by an party design professional sociologist.
Standard: Refere CESBA Assess	ence: MED Project - SNTool ment System.
G. Social	Aspects SN Tool
G10 Perceptual G10. 2 Impact of Commerce Environment Intent: To avoid visual environment the integration of commerce	cial Signage on the Visual ronment obstruction through commercial signage.
Indicator	Unit of Measure
Indicator Visual Impact of exterior commercial signage.	Unit of Measure Score
Indicator Visual Impact of exterior commercial signage. Assessment Methodolo	Unit of Measure Score
Indicator Visual Impact of exterior commercial signage. Assessment Methodolo Aggregate visual impact of based on degree of integ diversity in signage dime determined by a sample of	Unit of Measure Score ogy: exterior commercial signage, ration with building exterior, ensions and illumination; as of the local area population.

G. s	ocial /	Aspects	SN Tool		
G1 0 Perceptu	Jal				
G10.3 Impact of C	Overhead	Electric Distribution Sys	tem		
Intent: To avoid visu overhead	Intent: To avoid visual environment obstruction caused by overhead electric distribution system.				
Indicator		Unit of Measur	е		
Visual impact above-grade elec distribution syste	of trical ems	Score			
Assessment Methodology: Aggregate visual impact of above-grade electrical distribution systems, based on degree of visual clutter; as determined by a sample of the local area population.					
Standard: -		Reference: CESBA MED Project -			

<b>B</b> H.Economy
Description of the Information
H: Issue
Hx: Category
H1: Economic Performanc e
H2: Employment
H3: Innovatio n
H4: ICT Infrastructure
Hx.x: Criterion
Intent: Description of the objective of t criterion
Indicator: Name of the indicator to b calculated
Unit of Measure: Measuring unit a each indicator
<b>Standard:</b> The calculation standard for the criterion

**References:** The acquiring source of information

★ Key Performance Indicator

(5)	H. Ecor	nomy	SN Tool	
H2 E	mployment			
H2.1 U	nemployment	Rate		
Intent: To assess the labour market status, the economy development and citizens' quality of life.				
Indi	cator	Unit of Measur	e I	
Percentage adults un actively wo	of working age employed or rking for work.	%		
Assessment Methodology: 1. Calculate the number of working age adults unemployed or actively looking for work in the neighborhood. (A) - Numerator 2. Calculate the number of working age people in the neighborhood. (B)-Denominator 3. Calculate the value of the indicator as: A/B(%)				
Standard:	•	Reference: CESBA MED Project - Assessment System.	SNTool	

6	H. Ecor	nomy	SN Tool	
H1 Ec	onomic Perfo	ormance		
H1.1 Ave	erage Annual P idents	er-Capita Income of		
Intent:	To evaluate the	economic well-being.		
Indic	ator	Unit of Measur	е	
Percentage per-capit	e of average a income.	%		
Assessme 1. Calculate neighborhoo 2. Calculate urban region 3. Calculate	Assessment Methodology: 1. Calculate the income per-capita of residents in the neighborhood. (A) - Numerator 2. Calculate the income per-capita income of the whole urban region. (B)-Denominator 3. Calculate the value of the indicator as: A/B(%)			
Standard:		Reference: CESBA MED Project - S Assessment System.	SNTool	
6	H. Ecor	nomy	SN Tool	
H2 Ur	H2 Unemployment			
H2.2 Youth unemployment rate				
Intent: To quantify and analyze the current labor market trends and challenges of young people.				
Indic	ator	Unit of Measur	е	
Percentage o yo	f unemployed uth.	%		

### Assessment Methodology:

**Reference:** ISO 37120: Sustainable Cities and Communities - Indicators for City Services and Quality of Life.

![](_page_47_Figure_8.jpeg)

Indicator	Unit of Measure
Percentage of the neighborhood served by wireless broadband (3G,4G,5G)	%

### **Assessment Methodology:**

SNTool MED

<ol> <li>Calculate the armobile services (km</li> <li>Calculate the tota</li> <li>Calculate the tota</li> <li>Calculate the value</li> <li>Note: Each service and, 4G)</li> </ol>	ea of the neighborhood covered by n <sup>2</sup> ). (A) - Numerator al area of the neighborhood (Km <sup>2</sup> ). (B)-Denominator alue of the indicator as: A/B(%) should be reported on separately (3G,
itandard: -	<b>Reference:</b> UNECE.Collection Methodology for Key Performance Indicators for Smart Sustainable Cities

SNTool MED

(5) H. Ecor	nomy	SN Tool		
H4 ICT Infrastruct	H4 ICT Infrastructure			
H4.1 Fixed Broadband	Subscriptions			
Intent: To assess the act technology	cess to information and connectivity.	1		
Indicator	Unit of Measur	e		
Percentage of households with fixed (wired) broadband.	%			
Assessment Methodolo 1. Calculate the number of f in the neighborhood. (A) - Nu 2. Calculate the total number neighborhood	Assessment Methodology: 1. Calculate the number of fixed broadband subscriptions in the neighborhood. (A) - Numerator 2. Calculate the total number of households in the			
(B)-Den <b>3.</b> Calculate the value of the A/I	ominator = indicator as: 3(%)			
Standard: Re	Standard: Reference:			
for Sm	Key Performance Indicate	ors for		
Smult Sustainable Chies.				
(3) H. Economy SN Tool				
H4 ICT Infrastruct	ure			
H4.3 Availability of WI	FI in Public Areas	I		
Intent: To increase access to internet at little or no cost.				
Indicator	Unit of Measur	e I		
Number of public WIFI hotspots in the neighborhood per 1.000 inhabitants.	n/1000 inhabitants			
Assessment Methodology:				
<ol> <li>Calculate the total number of WIFI hotspots provided by the neighborhood's administration.</li> </ol>				
(A) - Numerator <b>2.</b> Calculate one 1.000th of the neighborhood's total population.				
<b>3.</b> Calculate the value of the indicator as: A/B(%)				
Current Pe	ference:			

95

for Key Performance Indicators for Smart Sustainable Cities.

(5)	H. Ecor	nomy	SN To	
H4 H4.4	ICT Infrastructu Mobile Phone Sub:	J <b>re</b> scriptions		
Inter technolog	nt: To evaluate the lagy, information, con innove	evels of communication nmunication technolog ation.	n ıy and	
Ir	ndicator	Unit of Measur	е	
Total number of mobile phones subscriptions in the area per 1.000 inhabitants in the neighborhood.				
Assess	ment Methodolo	gy:		
<ol> <li>Calculate the total number of mobile phone connections in the neighborhood.         <ul> <li>(A) - Numerator</li> <li>Calculate one 1.000th of the neighborhood's total population</li></ul></li></ol>				
Standard	d: Re ISO - and City	ference: 937120: Sustainable Citi Communities - Indicato 9 Services and Quality of	es ors for Life <b>.</b>	

1

![](_page_49_Picture_0.jpeg)

**Description of the Information** : Issue X: Category 11: Climate Change Mitigatio n 12: Adaptation of the Climatic Action: Heatwaves & Increase of Temperatures 13: Adaptation of the Climatic Action: Pluvial Flood 14: Adaptation to the Climatic Action: Fluvial & Coastal Flood 15: Adaptation to the Climatic Action: Drought 16: Adaptation to the Climatic Action: Wildfire 17: Climatic Hazard: Win d **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

Mitigation & Adaptation		SN Tool		
I1 Climate Change Mitigation				
11.2 Greenhouse gas emissions from residential buildings				
Intent: To estimate urban greenhouse emissions from all residential buildings.				
Indicator	Unit of Measur	е		
Total amount of greenhouse gases in Kg (equivalent carbon dioxide units) generated over a calendar year per aggregated indoor useful floor area	Kg CO² eq / m²			
Assessment Methodolo	gy:			
A. Calculate the annual total final greenhouse emissions for the building operations in Kg CO <sup>2</sup> eq/m <sup>2</sup> , for each residential building.		ions each		

B. Calculate the aggregated useful floor area for all residential buildings.

C. Calculate the indicator:

A/B

ect - SNTool

Standard:	Reference:
	CESBA MED Pro Assessment Syst

	I. Climate Mitigation &	Change: Adaptation	SN Tool	
- 11	Climate Chang	ge Mitigation		
Cll.1 Green House Gas Emissions				
Inte ne	ent: To assess the ac ighborhood is maki	lverse contribution the ng to climate change.		
Ir	ndicator	Unit of Measur	е	
Total amount of greenhouse gases (equivalent to carbon dioxide units) per inhabitant, generated from building operations per year.				
Assessment Methodology:				
1. Calcu tonees ( a calend including boundar	late the total amour equivalent carbon di ar year by all activit g indirect emissions ies.	It of greenhouse gases i oxide units) generated o ies within the neighborh outside neighborhood	n over lood,	
2. Calcul	(A) - Nu ate the total populati	umerator on of the neighborhood.		
<b>3.</b> Calcu	(B)-Dend Jate the value of the A	ominator e indicator as: /B		
Standard	l: Re ISC - gp	e <b>ference:</b> D 37120: Sustainable Cit d Communities-Indicator:	ies s for	

	Mitigation &	Adaptation	SN Tool	
1	Climate Chang	e Mitigation	 	
11.3	I1.3 Embodied Carbon for Construction and Renovation Infrastructures			
Intent: To promote the use of construction materials for infrastructures with a low embodied carbon.				
Ir	ndicator	Unit of Measur	e ¦	
Aggregated total embodied carbon per aggregated linear area. kg CO <sub>2</sub> eq / m <sup>2</sup>			 2   	
Assessment Methodology:				
<ol> <li>Identify the basic composition of each infrastructure element. The mass of each constituent material has to be estimated:</li> <li>Aggregate by material: The mass for each constituent material should thereafter be aggregated to obtain the total mass for each type of material.</li> <li>Calculate the embodied carbon of each material by multiplying the specific mass with its corresponding carbon coefficient (national coefficients or international</li> </ol>				
carbon coefficients (national coefficients or international databases) the coefficients are quantified in kilograms of $CO_2$ equivalent (kg $CO_2$ eq) per unit mass (kg) of the material or sometimes also expressed per unit area of material (kg $CO_2$ eq/m <sup>2</sup> ). 4. Calculate the total linear area of the infrastructures			ns of I ) per I pres- I res I	

considered. 5. Calculate the indicator's value as:

Total embodied carbon of the building /Total linear area.

Standard:	Reference:
EN 15978	CESBA MED Project - SNT Assessment System

I. Climate Change : 69 SN Too **Mitigation & Adaptation** 11 **Climate Change Mitigation** Embodied Carbon for Construction/ 11.4 **Renovation of Residential Buildings** Intent: To promote the use of construction materials with a low embodied carbon Indicator Unit of Measure Aggregated total embodied carbon per aggregated kg CO<sub>2</sub> eq / m<sup>2</sup> indoor useful floor area. **Assessment Methodology:** 1. Identify the basic composition of each building element for

all residential building of the neighborhood. The mass of each

constituent material has to be estimated:

2. Aggregate by material: The mass for each constituent material should thereafter be aggregated to obtain the total

- mass for each type of material. 3. Calculate the embodied carbon of each material by
- multiplying the specific mass with its corresponding carbon coefficient (national coefficients or international databases)
- the coefficients are quantified in kilograms of CO2 equivalent
- (kgCO 2eq) per unit mass (kgCO 2 eq) per unit mass (kg) of the
- material or sometimes also expressed per unit area of material (kgCO<sub>2</sub>eq/m<sup>2</sup>). 4. Calculate the total interal floor area of the residential
- buildings in the neighborhood.
- 5. Calculate the indicator's value as:
- Total embodied carbon of the building /Total useful internal floor area of residential buildings.

Standard:	Reference:
EN 15978	CESBA MED Project - SNTool Assessment System

ß		I. Climate Mitigation &	Change: Adaptation	SN Tool	
I	1	Climate Chan	ge Mitigation		
11.0	I1.6 CO <sub>2</sub> Sequestration				
	Inter	nt: To promote the ( neighb	CO2sequestration in the borhood	e I I	
	Ir	ndicator	Unit of Measur	e i	
Potential CO <sub>2</sub> sequestration in the neighborhood per hectare.		l CO2 sequestration neighborhood per hectare.	tepCO2 /ha	     	
Assessment Methodology: 1. Calculate the amount of CO <sub>2</sub> sequestration in the neighborhood. (A) - Numerator 2. Calculate the total area of the neighborhood in hectares. (B)-Denominator 3. Calculate the value of the indicator as: A/B					
Stan	daro	d: Ro Cl - As	e <b>ference:</b> ESBA MED Project - SNTœ ssessment System	əl	

SNTool MED

SNTool MED

<b>E</b>	I. Climate Mitigation &	Change : Adaptation	SN Tool		
1	Climate Chang	ge Mitigation			
11.5	I1.5 Embodied Carbon for Construction/Renovation of Public Offices/Educational Buildings				
Intent: To inf	Intent: To promote the use of construction materials for infrastructures with a low embodied carbon.				
Ir	ndicator	Unit of Measur	'e i		
Aggrega carboi	ited total embodied n per aggregated linear area.	kg CO₂eq / m	2   2   		
Assess	ment Methodolo	ogy:	1		
<ol> <li>Assessment Methodology:</li> <li>I. Identify the basic composition of each building element for all office/educational buildings. The mass of each constituent material has to be estimated:</li> <li>Aggregate by material: The mass for each constituent material should thereafter be aggregated to obtain the total mass for each type of material.</li> <li>Calculate the embodied carbon of each material by multiplying the specific mass with its corresponding carbon coefficient (national coefficients or international databases) the coefficients are quantified in kilograms of CO2equivalent (kgCO2eq) per unit mass (kgCO2eq) per unit mass (kg) of the material or sometimes also expressed per unit area of material (kgCO2eq/m<sup>2</sup>).</li> <li>Calculate the total useful internal floor area for all offices/educational buildings of the neighborhood.</li> <li>Calculate the indicator's value as: Total embodied carbon of the building /Total useful internal</li> </ol>					
		<i>c</i>			
Sidhadra	a: Ki N 15978 CI As	ESBA MED Project - SNTœ isessment System	Ы		
<b>E</b>	I. Climate Mitigation &	Change: Adaptation	SN Tool		
12	Adaptation To Th Heatwaves & Inc	e Climatic Action: rease of Temperature	s		
12.1	Albedo				
Intent: To	estimate the exte effect in the r	nt of the Urban Heat neighborhood.	Island		
Ir	ndicator	Unit of Measur	е I		
Mean Index of roofs in	Solar Reflectance paved surfaces and the neighborhood	SRI			
Assess	ment Methodolo	gy:			
<ol> <li>Identify the boundaries of the area being assessed.</li> <li>Obtain records of local ambient temperatures and wind speeds during summer conditions over a 3-year period.</li> </ol>					
3. Obtai	<b>3.</b> Obtain similar data for the larger urban region.				
<b>4.</b> Identify differences between the local and regional UHI effects.					
5. Identify factors in configuration of buildings, vegetation, surface albedo and, other local factors that may explain the differences.					
Standard	d: Ro	eference:	J		
		sessment System			

![](_page_50_Picture_0.jpeg)

I. Climate	Change:
Adaptation To Th	e Climatic Action
Heatwaves & Inc	rease of Temperatures
2.3 Green Roofs	
ntent: To determine the agg	regated area of green ro
on all buildings relative to t	he total surface area in t
neighbo	orhood.
Indicator	Unit of Measure
Aggregate area of huilding	
oofs covered with vegetated	%
materia	
Assessment Methodolo	gy:
1. Identify the buildings	with green roofs and
estimate the aggregate	net green roof area.
2. Determine the ratio o	f the aggregate green
roof area to the total su	face area in the
neighborhood.	
tandard: Re	eference:
• As	
	sessment System
	sessment System
	sessment System
I. Climate	Change:
I. Climate Mitigation &	Change: Adaptation
I. Climate Mitigation & Adaptation To Th Pluvial Flood	Change: Adaptation e Climatic Action:
I. Climate Mitigation & I3 Adaptation To Th Pluvial Flood	Change: Adaptation e Climatic Action:
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba	Change: Adaptation e Climatic Action: n Drainage
I. Climate Mitigation & Adaptation To Th Pluvial Flood	Change: Adaptation e Climatic Action: n Drainage
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure	Change: Adaptation e Climatic Action: n Drainage urban drainage.
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure	Change: sw Adaptation e Climatic Action: n Drainage urban drainage.
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure	Change: Adaptation e Climatic Action: n Drainage urban drainage.
I. Climate Mitigation & Adaptation To Th Pluvial Flood Sustainable Urba Intent: To ensure	Change: SN Adaptation SN e Climatic Action: n Drainage urban drainage. Unit of Measure
<ol> <li>I. Climate Mitigation &amp; Adaptation To Th Pluvial Flood</li> <li>Sustainable Urba</li> <li>Intent: To ensure</li> <li>Indicator</li> <li>Share of the optimal capacity of sustainable</li> </ol>	Change: SN Adaptation e Climatic Action: n Drainage urban drainage. Unit of Measure
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems.	Change: Adaptation e Climatic Action: n Drainage urban drainage. Unit of Measure %
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems.	Change: sw Adaptation sw e Climatic Action: n Drainage urban drainage. Unit of Measure %
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems.	Change: sw Adaptation e Climatic Action: n Drainage urban drainage. Unit of Measure %
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems.	Change: sk Adaptation sk e Climatic Action: n Drainage urban drainage. Unit of Measure %
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems. Assessment Methodoloo I. Calculate the share of the	Change: sessment System Change: sessment System Adaptation e Climatic Action: n Drainage urban drainage. Unit of Measure % gy: optimal capacity of
<ol> <li>I. Climate Mitigation &amp; Adaptation To Th Pluvial Flood</li> <li>Sustainable Urba</li> <li>Sustainable Urba</li> <li>Intent: To ensure</li> <li>Indicator</li> <li>Share of the optimal capacity of sustainable urban drainage systems.</li> <li>Assessment Methodolo</li> <li>Calculate the share of the sustainable urban drainage</li> </ol>	Change: Adaptation SN Adaptation SN e Climatic Action: n Drainage urban drainage. S gy: optimal capacity of systems.
<ol> <li>I. Climate Mitigation &amp; Adaptation To Th Pluvial Flood</li> <li>Sustainable Urba</li> <li>Sustainable Urba</li> <li>Intent: To ensure</li> <li>Indicator</li> <li>Share of the optimal capacity of sustainable urban drainage systems.</li> <li>Assessment Methodolo</li> <li>Calculate the share of the sustainable urban drainage (A) - Nu</li> <li>Calculate the optimal capacity</li> </ol>	Change: Adaptation SN Adaptation SN e Climatic Action: n Drainage urban drainage. Unit of Measure % gy: optimal capacity of systems. umerator city of sustainable urban
<ol> <li>I. Climate Mitigation &amp; Adaptation To Th Pluvial Flood</li> <li>Sustainable Urba</li> <li>Sustainable Urba</li> <li>Intent: To ensure</li> <li>Indicator</li> <li>Share of the optimal capacity of sustainable urban drainage systems.</li> <li>Assessment Methodolo</li> <li>Calculate the share of the sustainable urban drainage (A) - Nu</li> <li>Calculate the optimal capacity (A) - Nu</li> <li>Calculate the optimal capacity (A) - Nu</li> </ol>	Change: sessment System Change: Adaptation Change: SN Adaptation Change Change: SN Chang
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems. Assessment Methodolo I. Calculate the share of the sustainable urban drainage (A) - Nu 2. Calculate the optimal capa drainage systems. (B)-Den 3. Calculate the value of the	Change: Adaptation SN Adaptation SN e Climatic Action: n Drainage urban drainage. Unit of Measure % gy: systems. merator city of sustainable urban pominator e indicator as:
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems. Assessment Methodolo 1. Calculate the share of the sustainable urban drainage (A) - Nu 2. Calculate the optimal capacity (B)-Dental 3. Calculate the value of the Adaptation of the optimal (B)-Dental (A) - Nu	Change: sessment System Change: sessment System Adaptation e Climatic Action: n Drainage urban drainage. Unit of Measure % gy: optimal capacity of systems, umerator city of sustainable urban ominator e indicator as: i (%)
I. Climate Mitigation & Adaptation To Th Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems. Assessment Methodolo 1. Calculate the share of the sustainable urban drainage (A) - Nu 2. Calculate the optimal capacity (A) - Nu 2. Calculate the optimal capacity (B)-Dentor 3. Calculate the value of the A/B	Change: sN Adaptation SN e Climatic Action: n Drainage urban drainage. Unit of Measure % gy: optimal capacity of systems. merator city of sustainable urban ominator e indicator as: 5 (%)
<ol> <li>I. Climate Mitigation &amp;</li> <li>Adaptation To Th Pluvial Flood</li> <li>Sustainable Urba</li> <li>Intent: To ensure</li> <li>Indicator</li> <li>Share of the optimal capacity of sustainable urban drainage systems.</li> <li>Assessment Methodolo</li> <li>Calculate the share of the sustainable urban drainage (A) - Nu</li> <li>Calculate the optimal capa drainage systems.</li> <li>Calculate the value of the A/B</li> </ol>	Change: SN Adaptation SN e Climatic Action: n Drainage urban drainage. Unit of Measure % gy: optimal capacity of systems. Umerator city of sustainable urban pominator e indicator as: i (%)
Adaptation To The Nitigation & Adaptation To The Pluvial Flood 3.2 Sustainable Urbac Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems. Assessment Methodolo 1. Calculate the share of the sustainable urban drainage (A) - Nu 2. Calculate the share of the sustainable urban drainage (A) - Nu 3. Calculate the share of the sustainable urban drainage (B)-Den 3. Calculate the value of the A/E	Sessment System         Change:       SN         Adaptation       SN         e Climatic Action:       Image         n Drainage       Image         urban drainage.       Image         Unit of Measure       %         gy:       %         optimal capacity of systems.       Image         umerator       Image         indicator as:       Image         inditor       Image <t< td=""></t<>
Adaptation To The Nitigation & Adaptation To The Pluvial Flood 3.2 Sustainable Urba Intent: To ensure Indicator Share of the optimal capacity of sustainable urban drainage systems. Assessment Methodolo 1. Calculate the share of the sustainable urban drainage (A) - Nu 2. Calculate the optimal capa drainage systems. (B)-Den 3. Calculate the value of the A/E	Sessment System         Change:       SN         Adaptation       SN         e Climatic Action:       Image         n Drainage       Image         urban drainage.       Image         Unit of Measure       %         gy:       %         optimal capacity of systems.       %         urban drainable urban       %         gy:       %         optimal capacity of systems.       %         optimator       %         e indicator as:       %         ofference:       %

I. Climate Change: **E** SN Too **Mitigation & Adaptation** Adaptation To The Climatic Action: 13 Pluvial Flood ★ I3.3 Permeability of Land Intent: To improve the permeability of the area Indicator Unit of Measure Percentage of weighted ground permeability % **Assessment Methodology:**  Calculate the size (Sa) of the neighborhood area (m<sup>2</sup>). 2. Calculate the size of the surfaces with a different paving or occupied by constructions in the neighborhood area. Note: For further information on the calculation steps go to the KPIs Anex. Standard: **Reference: CESBA MED Project - SNTool** Assessment System I. Climate Change: <u>(</u> SN Tool **Mitigation & Adaptation** Adaptation To The Climatic Action: 14 Fluvial & Coastal Flood 14.2 **Protection of Vulnerable Zones** Intent: To assess vulnerable zones to flood risk. Indicator Unit of Measure Share of land in vulnerable % areas protected by flooding barriers. Assessment Methodology: 1. Calculate the amount of land in vulnerable areas protected by flooding barriers. (A)-Numerator 2. Calculate the total extension of land in the neighborhood. (B)-Denominator 3. Calculate the value of the indicator as: A/B (%) Standard: **Reference: CESBA MED Project - SNTool** Assessment System.

SNTool MED

![](_page_50_Figure_5.jpeg)

101

	KI.	I. Climate Mitigation &	Change: Adaptation	SN Tool
	15	Adaptation To Th Drought	e Climatic Action:	
	15.1	Rainwater Collect Buildings for Nor	ion and Storage fron -Potable Uses.	ייייייייייייייייייייייייייייייייייייי
	Intent	: To promote rainwo	ater collection for re-us	se.
	Ir	ndicator	Unit of Measur	е
	Share neigh rainwate	of buildings in the aborhood with a r collection system.	%	
	Assess	ment Methodolo	gy:	
	1. Calcu neighbo	late the number of b rhood with a rainwa (A)-Nut	ouildings in the ter collection system. merator	
	<b>2.</b> Calcu neighbor	late the total number hood.	of buildings in the	
	3. Calcul	(B) - Den ate the value of the ir A/B	ominator idicator as: ; (%)	
:	Standard	l: Re CE - As	e <b>ference:</b> ISBA MED Project - SNToo sessment System	ol

K)	I. Climate Change: Mitigation & Adaptation				
15	15 Adaptation To The Climatic Action: Drought				
15.3	15.3 Greywater Collection in Buildings for Non- Potable Uses				
lı	ntent: To reduce potab	le water consumption.			
			1		
	Indicator	Unit of Measur	e i		
Shar nei greyw	Share of buildings in the neighborhood with a greywater collection system				
Asse	ssment Methodolo	gy:			
<ol> <li>Calculate the number of buildings in the neighborhood with a greywater collection system.</li> <li>(A) Numerator</li> </ol>					
<b>2.</b> Co neigh	<b>2.</b> Calculate the total number of buildings in the neighborhood.				
<b>3.</b> Co	(B)-Denominator <b>3.</b> Calculate the value of the indicator as: A/B (%)				
Stando	Standard: Reference: CESBA MED Project - SNTool Assessment System.				

<u> </u>	I. Climate Mitigation &	Adaptation	SN Tool
15	Adaptation To Th	e Climatic Action:	
15.2	Rainwater Collectio	on and Storage for Outo	loor
Intent: To	o ensure the optimiz distribution		ge and
h	ndicator	Unit of Measu	re
Share of from pay surfaces i (excludi	rainwater collected red (non permeable) in the neighborhood ng buildings' roofs and plots)	%	
Assessment Methodology: 1. Calculate the amount of rainwater collected from paved (not permeable) surfaces in the neighborhood (excluding buildings' roofs and plots). (A)-Numerator 2. Calculate the maximum amount of rainwater collectable from paved (not permeable) surfaces in the neighborhood (excluding buildings' roofs and plots). (B)-Denominator			
Ctore daw	A/	B (%)	
stanaar	a: Ki _ Ci	ESBA MED Project - SNTc	ol
<b>63</b> 15 15.4	I. Climate Mitigation & Adaptation To Th Drought Local Vegetation	Change: Adaptation e Climatic Action:	SN Tool
Inte	ent: To promote the	use of local vegetation	n.
I	ndicator	Unit of Measu	re
Share o areas)	f landscape (green plated with local vegetation.	%	
Assess	ment Methodolo	gy:	
<ol> <li>Cala local vi</li> <li>Cala neighb</li> <li>Cala</li> </ol>	culate the extent of egetation in the nei (A)-Nu culate the total exte porhood. (B)-Den culate the value of t A/I	green areas planted v ighborhood. merator nt of green areas in th ominator he indicator as: B (%)	with
Standar	d: Ro	eference: ESBA MED Project - SNTc	ol
	- As	ssessment System.	

I. Climate Mitigation &	Change: SN Tool		
Adaptation To Th	e Climatic Action:		
I6.1 Wildfire Risk			
latent. To prove the wildlin			
	e risk of the heighborhood.		
1			
Indicator	Unit of Measure		
Percentage of the population exposed to wildfire risk.	%		
Assessment Methodolo	gy:		
wildfire risks in the neighbor (A)-Nu	hood. merator		
<b>2.</b> Calculate the total populati neighborhood.	on of the		
(B) - Der <b>3.</b> Calculate the value of the in A/E	ndicator as: 3 (%)		
Standard: Reference: CESBA MED Project - SNTool Assessment System			
I. Climate Change:			
I. Climate Mitigation &	Change: Adaptation		
I. Climate Mitigation & I6 Adaptation To Th Wildfire	Change: Adaptation e Climatic Action:		
I. Climate Mitigation & Adaptation To Th Wildfire 16.3 Fire Proof Ground	Change: Adaptation e Climatic Action:		
I. Climate Mitigation & Adaptation To Th Wildfire I6.3 Fire Proof Ground Intent: To assess the	Change: Adaptation e Climatic Action: d		
I. Climate Mitigation & Adaptation To Th Wildfire 16.3 Fire Proof Ground Intent: To assess the	Change: Adaptation e Climatic Action: d risk exposure to fire.		
<ul> <li>I. Climate Mitigation &amp; Adaptation To Th Wildfire</li> <li>Fire Proof Ground</li> <li>Intent: To assess the</li> </ul>	Change: Adaptation e Climatic Action: d risk exposure to fire.		
I. Climate Mitigation & Adaptation To Th Wildfire I6.3 Fire Proof Ground Intent: To assess the Indicator	Change: Adaptation e Climatic Action: d risk exposure to fire. Unit of Measure		
Image: Notice of ground cover materials (excluding buildings' plots) in vulnerable areas that are fire resistant.	Change:       SN Tool         Adaptation       SN Tool         e Climatic Action:       Image: Superstand Supe		
I. Climate Mitigation & Id Adaptation To Th Wildfire Id.3 Fire Proof Ground Intent: To assess the Indicator Share of ground cover materials (excluding buildings' plots) in vulnerable areas that are fire resistant. Assessment Methodolo	Change: SN Tool Adaptation e Climatic Action: d risk exposure to fire. Unit of Measure %		
I. Climate Mitigation & Adaptation To Th Wildfire     Io.3 Fire Proof Ground Intent: To assess the Intent: To assess the Intent: To assess the Intent: To assess the Indicator Share of ground cover materials (excluding buildings' plots) in vulnerable areas that are fire resistant. Assessment Methodolo I. Calculate the share of gro (excluding building's plots) in fire resistant in the neighbor (A) - No 2. Calculate the total extensio (excluding buildings' plots) in (a) - No	Change:       SN Tool         Adaptation       SN Tool         e Climatic Action:       Image: Comparison of the second sec		
I. Climate Mitigation &         16       Adaptation To The Wildfire         16       Adaptation To The Wildfire         16.3       Fire Proof Ground         Intent: To assess the         Intent: To assess the         Indicator         Share of ground cover materials (excluding buildings' plots) in vulnerable areas that are fire resistant.         Assessment Methodolo         1. Calculate the share of ground (excluding building's plots) in fire resistant in the neighborn (A) - Nu         2. Calculate the total extension (excluding buildings' plots) in neighborhood.       (B) - Der (B) - Der         3. Calculate the value of the in A/E	Change:       SN Tool         Adaptation       SN Tool         e Climatic Action:       Image: Comparison of the second sec		

SNTool MED

A I. Climate Mitigation &	Change: Adaptation	SN Tool	
16 Adaptation To Th Wildfire	e Climatic Action:		
16.2 Fire Protection			
Intent: To assess the level of	vulnerable zones to fir	e risk.	
Indicator	Unit of Measur	е	
Share of wildfire vulnerable areas protected by fire barriers.	%		
Assessment Methodolo	ogy:	1	
<ol> <li>Calculate the amount of protected by fire barriers.</li> <li>(A) - No</li> </ol>	wildifre vulnerable areas umerator	5	
<b>2.</b> Calculate the total extension in the neighborhood.	on of wildfire vulnerable a	reas	
<b>3.</b> Calculate the value of the i A/I	ndicator as: B (%)		
Standard: K C - A	e <b>terence:</b> ESBA MED Project - SNToo ssessment System	ol	
I. Climate Mitigation &	Change: Adaptation	SN Tool	
I. Climate Mitigation & 17 Climatic Hazard	Change: Adaptation d: Wind	SN Tool	
I. Climate Mitigation & I7 Climatic Hazard I7.1 Windproof Urban	Change: Adaptation d: Wind n Form	SN Tool	
I. Climate Mitigation & I7 Climatic Hazard I7.1 Windproof Urban Intent: To minimize the impo	Change: Adaptation d: Wind n Form 	SN Tool	
I. Climate Mitigation & I7 Climatic Hazard I7 Windproof Urban Intent: To minimize the import Indicator	Change: Adaptation d: Wind n Form act of wind in urban con Unit of Measur	SN Tool	
I. Climate Mitigation & Mitigation &         I7       Climatic Hazard         I7       Climatic Hazard         I7       Windproof Urban         Intent: To minimize the import       Indicator         Indicator       Strategies to minimize the impact of wind.	Change: Adaptation d: Wind n Form act of wind in urban cou Unit of Measur Score	SN Tool	
I. Climate Mitigation & Mitigation &         I7       Climatic Hazard         I7       Climatic Hazard         I7       Windproof Urban         Intent: To minimize the import       Indicator         Indicator       Strategies to minimize the impact of wind.         Assessment Methodology       Mitigation &	Change: Adaptation d: Wind n Form act of wind in urban cou Unit of Measur Score	SN Tool	
I. Climate Mitigation & Mitigation &         17       Climatic Hazard         17       Climatic Hazard         17       Windproof Urban         Intent: To minimize the import       Indicator         Indicator       Strategies to minimize the import of wind.         Assessment Methodolog       Evaluate the strategies add to minimize the	Change: Adaptation d: Wind 	SN Tool	
Assessment Methodolo     Evaluate the strategies add     to minimize the	Change: Adaptation d: Wind 	SN Tool	

![](_page_52_Picture_0.jpeg)

Description of the Information

J: Issue

### Jx:Category

J1: Urban Planning

J2: Management and Community Involvemen t J3: Public Buildings Operatio n

### 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

J. Governance SN Tool		SN Tool
J2 Management &	Community Involv	vement J3
J2.1 Involvement of Re Affairs	esidents in Communi	ty J3.1
Intent: To promote involveme affa	ent of citizens in com irs.	munity Intent:
Indicator	Unit of Measu	re i i
Percentage of residents population above 16 years having an involvement in community affairs.	%	Pero pu reco certit
Assessment Methodolo	gy:	i i I I Asse
<ol> <li>Calculate the amount of r years having an involvemen (A) - No</li> <li>Calculate the total populati 16 years.</li> </ol>	resident population ab t in community affairs. umerator on of the neighborhood	ove 16 above above <b>2.</b> Calc
(b) - Der <b>3.</b> Calculate the value of the in A/f	ndicator as: 3 (%)	<b>3.</b> Calc
Standard: Re CE Ass	ference: SBA MED Project - SNTc sessment System.	ol

	J. Gove	rnance	SN Tool
J1	Urban Plannin	g	
J1.1	Community Invol Activities	vement in Urban Plar	ıning
Intent: To raise the level of community involvement in planning through the redistribution of power.			
1	ndicator	Unit of Measur	е
Perce activ	entage of residents ve in public urban planning.	%	
Assessment Methodology: To characterize the indicator's value: Use of the Sherry Arnstein ladder on citizen participation. Rate the level of users' involvement on planning,			
<b>SCORE - 1 (LEVEL 1)</b> Non-participation or manipulation and therapy (in the Arnstein ladder). <b>SCORE 0 (LEVEL 2)</b> Degrees of tokenism: Information / Consultation / Placation (in the Arnstein ladder).			

**SCORE 3 (LEVEL 3)** Degrees of citizen power: Partnership, delegated power and citizen power (in the A rnstein ladder) in one phase, like diagnosis or after delivery. **SCORE 5 (LEVEL 4)** Degrees of citizen power: Partnership, delegated power and citizen power (in the Arnstein ladder), at every stages.

> Reference: CESBA MED Project - SNTool Assessment System.

### Standard:

Sherry Arnstein

	I. Govei	mance	SN Tool	
J3 Public	Building	s Operation		
J3.1 Public B	uildings S	ustainability		
Intent: To evaluate the number of buildings with a certifi- cation label.				
Indicator		Unit of Measur	е	
Percentage area public building recognized susta certifications on o operations	of the s with inability ongoing	%		
Assessment Me	Assessment Methodology:			
<ol> <li>Calculate the floor area of public buildings with certification to a recognized standard for ongoing building operations (m<sup>2</sup>)</li></ol>				
Standard: •	Re CE	s <b>ference:</b> SBA MED Project - SNToc Sessment System	)	

m	J. Gove	rnance	SN Tool	
J3	Public Building	s Operation		
J3.2	Operating Energy Costs for Public Buildings			
Intent: To evaluate the operational amount energy costs for public buildings.				
In	dicator	Unit of Measur	е	
Aggregated annual operating energy cost per aggregated indoor useful floor area.		\$/m2/yr		
<ul> <li>Assessment Methodology:</li> <li>I. Identify all the public buildings in the urban area and calculate their useful floor area (m ).</li> <li>Calculate the aggregated annual operating energy cost of the public buildings identified (€)</li> <li>Calculate the aggregated annual operating energy cost per aggregated indoor useful floor area, per year (€/m /yr)</li> <li>Note: in case of buildings in use, the total annual cost of actual thermal and electrical energy use from energy bills should be calculated taking the gverage energy cost over</li> </ul>				

### 3 years period. Standard:

Reference: CESBA MED Project - SNTool Assessment System.

J. Gover	rnance	SN Tool			
J3 Public Building	J3 Public Buildings Operation				
J3.3 Energy Consump	tion of Public Building	IS			
Intent: To evaluate the energy efficiency of public buildings.					
Indicator	Unit of Measur	e			
Total end use of energy in public buildings within a neighborhood by the total indoor useful area of the buildings.	kWh/m²				
Assessment Methodolo	gy:				
<ol> <li>Calculate the total end use of energy in public buildings withing the neighborhood (Kwh).         <ul> <li>(A) - Numerator</li> </ul> </li> <li>Calculate the total indoor useful area of these buildings (m<sup>2</sup>)             <ul> <li>(B) - Denominator</li> <li>Calculate the value of the indicator as:</li></ul></li></ol>					
Standard: Re	eference: SBA MED Project - SNToc	Ы			

# 4.Key performance indicators

![](_page_53_Picture_1.jpeg)

Definition:

the SNTool MED.

bourhoods in different cities.

B. Energy: 6

C. Water: 1

D. Solid waste: 1 E. Environmental quality: 1 F. Transportation and mobility: 2 G. Social aspects: 1 H. Economy: 0 I. Climate change: mitigation and adaptation: 2 J. Governance: 0

SNTool MED

SNTool MED

![](_page_53_Picture_20.jpeg)

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

KPIs are linked to the global sustainability goals in the Mediterranean and they are meaningful in any region.

KPIs allows to compare directly the perforamnce of neigh-

The value of KPIs is reported in the SMC Passport.

There are 14 key performance indicators :

A. Use of land and biodiversity: 0

### $\mathbf{f}$

**B2** 

### **B. Energy**

SN Tool

### **Energy Consumption**

Total Final Thermal Energy Consumption for Building Operations B2.1

Intent: To estimate urban thermal energy consumption for building operations

Indicator	Unit of Measure
Aggregated annual total final thermal energy consumption per aggregated indoor useful floor area	kWh/m²/yr

### **Assessment Methodology:**

To perform the calculation, it is possible to use metered or estimated data. The source of data must always be clearly declared.

For the evaluation of the actual performance of the urban area it is preferable to use metered data. If metered data aren't available, estimated data shall be used. Estimated data shall be used for evaluating a Iternative scenarios in planning and decision-making processes. In reporting the indicator's value, the data source must be indicated.

### Use of Estimated Data

1. In the calculation of the final thermal energy consumption, the following energy uses must be considered: Heating, Cooling, Domestic Hot Water.

2. For each building in the local area, calculate the annual final thermal energy consumption in kilowatts hours (kWh/year)

3. Sum the annual final thermal energy consumption of each building up to an aggregated total annual final thermal energy consumption (kWh/year)

4.Sum the indoor useful area of each building in the area up to an aggregated indoor useful area value (m<sup>2</sup>)

5. Calculate the indicator's value as: aggregated annual total final thermal energy consumption/aggregated indoor useful area (kWh/m²/year)

Note: Calculations are based on EN 13790 using the quasi-steady state monthly method.

### Use of Metered Data

1. In the evaluation of the final thermal energy consumption, the following energy uses must be considered: Heating, Cooling, Domestic Hot Water

2. For each building in the local area, collect the metered annual final thermal energy consumption in kilowatt hours (kWh/year)

3. Sum the annual final thermal energy consumption of each building up to an aggregated total annual final thermal energy consumption (kWy/year)

4.Sum the annual final thermal energy consumption of each building up to an aggregated total annual final thermal energy consumption (kWy/year)

5. Calculate the indicator's value as: aggregated annual total final thermal energy consumption/aggregated indoor useful area (kWh/m²/year)

Note: The metered energy consumption is suitable for the indicator's calculation only if the building has been in use for 3-years, in order to ensure that there has been time enough to have building systems reach their normal operating efficiency levels, and also to factor out unusual seasonal variations. This means that the buildings assessed are at least 3 years old.

**Reference:** 

Standard: EN 13790

CESBA MED Project - SNTool Assessment System

![](_page_54_Picture_26.jpeg)

**Total Final Electrical Energy Consumption for Building Operations** 

Intent: To estimate urban electrical energy consumption for building operations.

### Indicator

Aggregated annual total final electrical energy consumption per aggregated indoor useful floor area.

### **Assessment Methodology:**

To perform the calculation, it is possible to use metered or estimated data. The source of data must always be clearly declared.

For the evaluation of the actual performance of the urban area it is preferable to use metered data. If metered data aren't available, estimated data shall be used. Estimated data shall be used for evaluating alternative scenarios in planning and decision-making processes. In reporting the indicator's value, the data source must be indicated.

### Use of Estimated Data

1. In the calculation of the final electrical energy consumption, the following energy uses must be considered: heating, cooling, domestic hot water and, lighting. 2. For each building in the local area, calculate the annual final electrical energy consumption in kilowatts hours (kWh/year).

3. Sum the annual final electrical energy consumption of each building up to an aggregated total annual final electrical energy consumption (kWh/year). **4.**Sum the indoor useful area of each building in the area up to an aggregated indoor useful area value (m<sup>2</sup>).

5. Calculate the indicator's value as: aggregated annual total final electrical energy consumption/aggregated indoor useful area (kWh/m<sup>2</sup>/year). Note: Calculations are based on EN 13790 using the guasi-steady state monthly method.

### Use of Metered Data

SNTool MED

1. In the evaluation of the final electrical energy consumption, the following energy uses must be considered: Heating, Cooling, Domestic Hot Water and Lighting. 2. For each building in the local area, collect the metered annual final electrical energy consumption in kilowatt hours (kWh/year)

3. Sum the annual final electrical energy consumption of each building up to an aggregated total annual final electrical energy consumption (kWy/year) 4. Sum the annual final thermal energy consumption of each building up to an aggregated total annual final electrical energy consumption (kWy/year) 5. Calculate the indicator's value as: aggregated annual total final electrical energy consumption/aggregated indoor useful area (kWh/m<sup>2</sup>/year) Note: The metered energy consumption is suitable for the indicator's calculation only if the building has been in use for 3-years, in order to ensure that there has been time enough to have building systems reach their normal operating efficiency levels, and also to factor out unusual seasonal variations. This means that the buildings assessed are at least 3 years old.

Standard: EN 13790

SNTool MED

Unit of Measure

kWh/m<sup>2</sup>/yr

### (J

B2.7

### **B.** Energy

SN Too

### $(\mathbf{z})$

**B3.**1

### 2 Demos

**B3** Renewable Energy

Share of Renewable Energy On-Site, I for Building Operations

Intent: To incentive the consumption and production of renewable energy

### Indicator

Total consumption of final thermal energy generated from renewable sources on-site by total final thermal energy consumption

### **Assessment Methodology:**

To perform the calculation, it is possible to use metered or estimated data. The source of data must always be clearly declared.

For the evaluation of the actual performance of the urban area it is preferable to use metered data. If metered data aren't available, estimated data shall be used. Estimated data shall be used for evaluating alternative scenarios in planning and decision-making processes. In reporting the indicator's value, the data source must be indicated.

### **Use of Estimated Data**

**1.** In the calculation of the final thermal energy consumption, the following energy uses must be considered: heating, cooling, domestic hot water.

**2.** For each building in the local area, calculate the annual final thermal energy consumption in kilowatt hours (kWh/year).

**3.** Sum the annual final thermal energy consumption of each building up to an aggregated total annual final thermal energy consumption (kWh/year).

4. For each building in the local area, calculate the annual final thermal energy consumption from on-site renewable energy sources in kilowatt hours.

5. Sum the annual final thermal energy consumption from on-site renewable sources of each building up to an aggregated total annual final thermal energy consumption from on-site renewable sources (kWh/year).
6. Calculate the indicator as:

Annual total final thermal energy consumption from on-site renewable sources / Annual total final thermal energy consumption.

Note: Calculations are based on EN 13790 using the quasi-steady state monthly method.

### **Use of Metered Data**

**1.** In the evaluation of the final thermal energy consumption, the following energy uses must be considered: heating, cooling, domestic hot water.

**2.** For each building in the local area, collect the metered annual final thermal energy consumption) in kilowatt hours (kWh/year).

**3.** Sum the annual final thermal energy consumption of each building up to an aggregated total annual final thermal energy consumption (kWh/year).

**4.** For each building in the local area, collect the monitored annual final thermal energy consumption from on-site renewable sources in kilowatt hours (kWh).

5. Sum the annual final thermal energy consumption from on-site renewable sources of each building up to an aggregated total annual final thermal energy consumption from on-site renewable sources (kWh/year).
6. Calculate the indicator as:

Annual total thermal energy generation from on-site renewable energy sources / Annual total final thermal energy consumption.

Note: The metered energy consumption is suitable for the indicator's calculation only if the building has been in use for 3-years, in order to ensure that there has been time enough to have building systems reach their normal operating efficiency levels, and also to factor out unusual seasonal variations. According to the Renewables Energy Directive (RED 2018),, energy from renewable sources means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases. Heat pumps enabling the use of aerothermal, geothermal or hydrothermal heat at a useful temperature level need electricity or other auxiliary energy to function. The energy used to drive heat pumps should therefore be deducted from the total usable heat. Only heat pumps for which SPF > 1,15 \*  $1/\eta$  shall be taken into account.

Standard:		Refe
	EN 13790	CESE

**Energy Consumption** 

**Total Primary Energy Demand for Building Operations** 

Intent: To reduce the need of primary energy for building operations

Indicator Aggregated annual total primary energy consumption per aggregated indoor useful floor area

kWh/m²/yr

Unit of Measure

### **Assessment Methodology:**

To characterize the indicator's value:

**1**.In the calculation of the primary energy consumption, the following energy uses must be considered: heating, cooling, ventilation, auxiliaries, domestic hot water and lighting.

**2.**For each building in the local area, calculate the annual final (thermal and electric) energy consumption per energy carrier in kilowatt hours (kWh/year)

**3.**Sum the annual final energy consumption of each building up to an aggregated annual final energy consumption per energy carrier (kWh/year).

**4.**Using the national conversion factors, convert the aggregated annual final energy consumption per energy carrier in annual primary energy consumption per energy carrier (kWh/year).

**5.**Sum the annual primary energy consumption per energy carrier up to an aggregated annual total primary energy consumption (kWh/year).

**6.**Sum the indoor useful area of each building in the area up to an aggregated indoor useful area value  $(m^2)$ .

7. Calculate the indicator's value as:

Aggregated annual total primary energy consumption / Aggregated indoor useful area (kWh/m² /year).

Note: Calculations are based on EN 13790 using the quasi-steady state monthly method.

Standard: EN 13790 **Reference:** CESBA MED Project - SNTool Assessment System.

SNTool MED

### Share of Renewable Energy On-Site, Relative to Final Thermal Energy Consumption

	Unit of Measure
y e n	%

e**rence:** BA MED Project - SNTool Assessment System.

### **B.** Energy

### **B**3 Renewable Energy

Share of Renewable Energy On-Site, Relative to Final Electric Energy Consumption **B3.4** 

Intent: To incentive the consumption and production of renewable energy

\_\_\_\_\_

Indicator	Unit of Measure
Total consumption of final electric energy generated from renewable sources on-site divided by the total final electric energy consumption	%

### **Assessment Methodology:**

To perform the calculation, it is possible to use metered or estimated data. The source of data must always be clearly declared.

For the evaluation of the actual performance of the urban area it is preferable to use metered data. If metered data aren't available, estimated data shall be used. Estimated data shall be used for evaluating alternative scenarios in planning and decision-making processes. In reporting the indicator's value, the data source must be indicated. Exported energy is the one delivered by technical systems through the system boundary (urban area) and used outside the system boundary. Exported energy is a benefit beyond the system boundary and it has not to be included in the calculation.

### **Use of Estimated Data**

1. In the calculation of the final electric energy consumption, the following energy uses must be considered: heating, cooling, ventilation, auxiliaries, domestic hot water and lighting.

2. For each building in the local area, calculate the annual final electric energy consumption in kilowatt hours (kWh/year).

3.Sum the annual final electric energy consumption of each building up to an aggregated total annual final electric energy consumption (kWh/year).

4. For each building in the local area, calculate the annual final electric energy consumption from on-site renewable energy sources in kilowatt hours

5. Sum the annual final electric energy consumption from on-site renewable sources of each building up to an aggregated total annual final electric energy consumption from on-site renewable sources (kWh/year). **6.**Calculate the indicator as:

Annual total final electric energy consumption from on-site renewable sources / Annual total final electric energy consumption.

Note: Calculations are based on EN 13790 using the quasi-steady state monthly method.

### Use of Metered Data

1. In the evaluation of the final electric energy consumption, the following energy uses must be considered: heating, cooling, ventilation, auxiliaries, domestic hot water and lighting water.

2. For each building in the local area, collect the metered annual final electric energy consumption) in kilowatt hours (kWh/year).

3. Sum the annual final electric energy consumption of each building up to an aggregated total annual final electric energy consumption (kWh/year).

4. For each building in the local area, collect the monitored annual final electric energy consumption from on-site renewable sources in kilowatt hours (kWh).

5.Sum the annual final electric energy consumption from on-site renewable sources of each building up to an aggregated total annual final electric energy consumption from on-site renewable sources (kWh/year). **6.**Calculate the indicator as:

Annual total electric energy generation from on-site renewable energy sources / Annual total final electric energy consumption.

Note: The metered energy consumption is suitable for the indicator's calculation only if the building has been in use for 3-years, in order to ensure that there has been time enough to have building systems reach their normal operating efficiency levels, and also to factor out unusual seasonal variations.

According to the Renewables Energy Directive (RED 2018), energy from renewable sources means energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases.

Heat pumps enabling the use of aerothermal, geothermal or hydrothermal heat at a useful temperature level need electricity or other auxiliary energy to function. The energy used to drive heat pumps should therefore be deducted from the total usable heat. Only heat pumps

Standard: EN 13790

**Reference:** CESBA MED Project - SNTool Assessment System.

SNTool MED

![](_page_56_Picture_30.jpeg)

Intent: To incentive the consumption and production of renewable energy

### Indicator

Total consumption of primary energy generated from renewable sources on-site divided by the total final electric energy consumption

### **Assessment Methodology:**

SNToo

1. In the calculation of the primary energy consumption, the following energy uses must be considered: heating, cooling, ventilation, auxiliaries, domestic hot water and lighting. 2. For each building in the local area, calculate the annual final (thermal and electric) energy consumption per energy carrier in kilowatt hours (kWh/year) 3. Sum the annual final energy consumption of each building up to an aggregated annual final energy consumption per energy carrier (kWh/year). 4. Using the national conversion factors, convert the aggregated annual final energy consumption p er energy c arrier i n annual p rimary energy c onsumption p er energy c arrier (kWh/year).

5. Sum the annual primary energy consumption per energy carrier up to an aggregated annual total primary energy consumption (kWh/year). 6. For each building in the local area, calculate the annual final (thermal and electric) energy consumption per on-site renewable energy source in kilowatt hours (kWh/year) – i.e. P.V, solar thermal panels, etc.

7. Sum the annual final energy consumption from on-site renewable energy sources of each building up to an aggregated annual final energy consumption per on-site renewable energy source (kWh/year).

8. Using the national conversion factors, convert the aggregated annual final energy consumption per on-site renewable energy source in annual primary energy consumption per on-site renewable energy source (kWh/year).

9. Sum the annual primary energy consumption per on-site renewable energy source up to an aggregated annual total primary energy consumption from on-site renewable energy sources (kWh/year).

10. Calculate the indicator's value as:

EN 13790

Aggregated total annual primary energy consumption from on-site renewable energy sources / Aggregated total annual primary energy consumption.

Note Calculations are based on EN 13790 using the guasi-steady state monthly method. Exported energy is the one delivered by technical systems through the system boundary (urban area) and used outside the system boundary. Exported energy is a benefit beyond the system boundary and it has not to be included in the calculation

SNTool MED

Standard:

112

### Share of Renewable Energy On-Site, Relative to the Total Primary Energy

Unit of Measure
%

**Reference:** CESBA MED Project - SNTool Assessment System.

C. Wa	sn tool		D. Solid
C2 Water Consumption		D2 Solid Wa	iste Management
C2. 3 Consumption of Potable Water in Resider	ntial Buildings	★D2.2 Access to S	Solid Waste and Recycling Co
Intent: To make an efficient	use of water resources.	Inten	nt: To improve separate collection
Indicator	Unit of Measure		
Annual potable water consumption per occupant.	L/occupant/yr		Indicator
Assessment Methodology:		Percento to solid points	age of inhabitants with access waste and recycling collection within a 400 meters walking distance.
The potable water consumption is calculated ba appliances and sanitary fittings in the buildings.	sed on metered data for water consuming		
The scope of the criterion includes the use of pot	able water for:	Assessment Me	ethodology:
Drinking water. Water for sanitation. Domestic hot water. Water for washina machine.		1. Calculate the cling collection p	share of inhabitant living with points in the neighborhood.
-Water for dishwasher. -Water for cleaning			(A) - Nui
alor for cloaning.		<b>2.</b> Calculate the	neighborhood's population.
o calculate the indicator:			(B) - Denc
1. For each residential building, collect the mon	itored annual potable water consumptions	<b>3.</b> Calculate the	value of the indicator as :
years period (litres).	Ust be estimated taking the average over 3		A/B
2. Sum the annual potable water consumption of total potable water consumption (litres/year).	each building up to an aggregated annual		
3. Estimate the number of residential buildings'	occupants.		
4. Calculate the indicator's value as:			
Aggregated annual total potable water co	onsumption / Number of occupants.		
Standard: Refere	ence:	Standard:	Kete UNEC

SNTool MED

SNTool MED

D. Solid	Waste	SN Tool
ent		
Recycling Col	lection Points	
arate collectio	n disposal, avoiding to burn waste.	
r j	Unit of Measure	
with access g collection ers walking	%	
nt living with borhood.	400m access to the solid waste and recy-	-
(A) - Nun	nerator	
opulation.		
(B) - Deno	minator	
ator as :		
A/B (	%)	
Refer UNECE	<b>ence:</b> -Collection Methodology for Key Performance ors for Smart Sustainable Cities	

13	E. Environme	ntal Quality SN Tool				
E1	Air Quality					
E1. 2	Particulate Matter (PM <sub>10</sub> ) Concentration	n				
Inter	ent: To assess the long-term ambient air quality with respect to particulates <10 mu (PM <sub>10</sub> ) in the neigborhood.					
	Indicator Unit of Measure					
	Number of days within a year that PM <sub>1</sub> concentration exceed the daily limit	o days/yr				
Asse	essment Methodology:					
1. Do of on 2. Ev	aily test air samples in accordance with no ne year. aluate the number of days exceeding the	ational or regional procedures over a period daily limits in a year.				
Star	adard Refe	rence				

6	F. Transportation	and Mobility	SN Tool	
F1	Performance of Mobility Services			
★F1. 1	Performance of the Public Transport Sys	em	1	
	Intent: To determine the performance of the public transportation system.			
	Indicator	Unit of Measure		
	Percentage of inhabitants that are within a 400 meters walking distance of at least one public transportation service stop.	%		
Asse	essment Methodology:			
<ol> <li>Locate the public/municipal transport stops with daily total service frequency of at least 20 trips, that serve the neighborhood.</li> </ol>				
<b>2.</b> Lo their	Locate all the residential buildings in the neighborhood with a walking distance from eir entrance to at least one of the located stops up to 400 meters.			
<b>3.</b> Co	Calculate the occupants of the selected buildings.			
<b>4.</b> Co	Calculate the total population of the neighborhood.			
<b>5.</b> Co dings	Calculate the indicator's value as the percentage of the occupants of the selected buil- ngs to the total population of the neighborhood.			
For t	or the calculation of the indicator the following are considered:		l I T	
- Or	Only residents of the neighborhood and not working people in the area.			
- A s	stop must have a daily total service frequency of at least 20 trips.		1	
			1	
			1	
			1	

- Only re
- A stop

Standard: Global Platform for Sustainable Cities -Urban Sustainability Frame

SNTool MED

**Reference:** CESBA MED Project - SNTool Assessment System.

<b>F</b>	F. Transportation	and Mobility	SN Tool
F2 Green M	<b>\obility</b>		G3 Availal
F2. 3 Bycicle Ne	etwork		★ G3.1 Bycicle I
Intent: To emph	azise the use of bycicles as a m	ethod to reduce traffic congestion and poll	ution. Intent: To def
	Indicator	Unit of Measure	
Total le neigh	ength of bicycle paths in the hborhood per inhabitant.	m/inhabitant	Perce within c
Assessment <b>A</b>	Methodology:		Assessment
1. Calculate the	total length of bicycle paths/la	ines in the neighborhood.	1. Identify loc
	(A) - Nur	nerator.	<b>2.</b> Calculate the from at least (
2. Estimate/Calculate the total number of inhabitants in the neighborhood.		Note	
(B) - Denominator.			
3. Calculate the	value of the indicator as:		
	A/	В	2. Health cent 3. Law enforce 4. Sport facilit 5. Food shops 6. Bank. 7. Post office. 8. Pharmacy. 9. Shopping c 10. Culture ar
			It is possible to Private service
Standard:	- Refer - UNECE Perform	e <b>nce:</b> -Collection Methodology for Key nance Indicators for Smart Sustainable Ci	Standard:
18		SNTo	ol MED SNTool MED

### G. Social bility of Public, Private Faci Network \_\_\_\_\_ termine t he accessibility and p roz

schools. sports facilities, superma

### Indicator

entage of inhabitants that are an 800 meters walking distance of at least 3 key services.

### Methodology:

ations of key services in the local

he percentage of the inhabitants key services coming from the ni

re:

schools, kindergartens, education

- ter (hospitals, medical ward, med
- ement areas (police station, etc.)
- ies.
- enter.
- nd leisure.

o consider only one key service fr es can be considered.

cial /	Aspects SN Tool			
Facilities and Services				
nd p ro. Iperma	ximity of key s ervices f or l ocal r esidents (e.g rkets, community buildings, etc.)			
	Unit of Measure			
are ance	%			
مامدها	1			
the ni	that are within 800 meters walking distance ne categories below.			
	-			
ucation d, med	i centers, etc.) ical center, etc.)			
, etc.)	. ,			
rvice fr	om each of the ten categories.			
Refe	rence:			
CESBA	A MED Project - SNTool Assessment System.			

<b>B</b>	I. Climate C Mitigation & A	Change: daptation
11	Climate Change Mitigation	
11.1	Greenhouse Gas Emissions	
lı	ntent: To assess the adverse contribution the	neighborhood is making to climate change.
	Indicator	Unit of Measure
	Total amount of greenhouse gases (equivalent carbon dioxide units) generatede from building operations over a calendar year per inhabitant.	t CO <sub>2</sub> eq./ ihbaitant /yr
Ass	essment Methodology:	
1. C unit: indii	Calculate the total amount of greenhouse go s) generated over a calendar year by all act rect emissions outside neighborhood bound	ases in tonees (equivalent carbon dioxide ivities within the neighborhood, including laries.
	(A) - Nun	nerator
<b>2.</b> C	alculate the total population of the neighbo	orhood.
	(B)-Denor	ninator
3. (	Calculate the value of the indicator as:	
	A/E	3
Sta	ndard: Refer - ISO 3 Indica	rence: 7120: Sustainable Cities and Communities - tors for City Services and Quality of Life.
120		SNTool ME

### I. Climate Change: 69 **Mitigation & Adaptation** Adaptation to the Climatic Action: Pluvial Flood 13 **★**13.1 Permeability of Land

Intent: To improve the permeability of the area.

### Indicator

Percentage of the weighted ground permeability.

### **Assessment Methodology:**

1. Calculate the size (Sa) of the neighborhood area (m<sup>2</sup>) 2. Calculate the size of the surfaces with a different paving or occupied by constructions in the neighborhood area (i.e. green areas, surfaces paved with asphalt, surfaces occupied by buildings, etc.). Include all the surfaces in the neighborhood area so that:

 $Sa = \sum_{i=1}^{n} Sa_{1}$ 

Sa = total surface of the neighborhood area  $Sa_i = surface i-th in the neighborhood area (m<sup>2</sup>)$ 

- Calculate the real permeability of soil considering the permeability coefficient of each surface.

Sa, i = i-th surface in the neighborhood area (m<sup>2</sup>)  $\alpha i =$  permeability coefficient of the i-th surface

- Calculate the indicator's value as:

Note:

- Reference permeability coefficients:
- Grass = 1
- Gravel = 0.9
- Sand = 0.9
- Plastic gratings filled with land/grass = 0.8
- Concrete gratings leaning on the grass = 0.6

Standard:	Refer
-	ISO 3
	Indica

![](_page_60_Picture_24.jpeg)

# **5.SMC** passport

Sustainable MED cities passport

![](_page_61_Picture_2.jpeg)

SNTool MED

Definition:

two different pages. tures of the analysis. ised version of SNTool.

Observation:

![](_page_61_Picture_10.jpeg)

- The SMC Passport template is a graphical visualisation of the main information concerning the assessment and it includes
- 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, unit of measure and The third page shows the sustainability results achieved by the neighbourhood using the contextual-
- 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.

Name of the Pilot Neighborhood

### SMC Passport Neighbourhood

### Short Description

Name:		Short Description		
Total area (km²):				
General location:				
City:				
МАР		IMAGE		
Demography		Climate		
Residential population in the area	Inhab	Annual precipitation	mm	
Urban residential density	Inhab/ha	Solar irradiance on horizontal	kWh/m²y	
Population working in the area	Persons	Winter / summer design	°C	
Other info		Heating degree days (base 18°C)	HDD	
Building Stock	_	Use of land and morphology		
Number of buildings in the area	number	Percentage of consumed land area	%	
Gross area of residential Buildings	m²	Total lenght of urban streets with	km	
Gross area office buildings	m²	Total lenght of bioveles lanes	m	
Gross area of retail/ Commercial buildings	m²	Other relevant info		
Total gross area of all buildings	m²			
Total gross area of buildings con- structed before 1975	m²			
Average building density (total m <sup>2</sup> / land surface in m <sup>2</sup> )	number			

1

### SMC Key Performance Indicators

CODE	CRITERIA	INDICATOR	VALUE	UNIT
B2.1	Total final thermal energy con- sumption for building operations	Aggregated annual total final thermal energy consumption per aggregated indoor useful floor area		kWh/m²/yr
B2.4	Total final electric energy consump- tion for building operations	Aggregated annual total final electric energy consumption per aggregated indoor useful floor area		kWh/m²/yr
B2.7	Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area		kWh/m²/yr
B3.1	Share of renewable energy on-site, in total final thermal energy con- sumption for building operations	Annual total thermal energy consump- tion from on-site renewable energy sources / annual total final thermal energy consumption.		%
B3.4	Share of renewable energy on-site, in final electrical energy consump- tion for building operations	Annual total electrical energy consump- tion from on-site renewable energy sources / annual total electrical energy consumption.		%
B3.7	Share of renewable energy on-site in total primary energy consump- tion for building operations	Annual total consumption of prima- ry energy generated from renewable sources on-site / total primary energy consumption.		%
C2.3	Consumption of potable water in residential buildings	Annual potable water consumption per occupant		L /occupant/yr
D2.2	Access to solid waste and recycling collection points	Percentage of inhabitants with access to solid waste and recycling collection points within 400 meters walking dis- tance.		%
E1.2	Particulate matter (PM10) concen- tration	Number of days within a year that PM10 concentration exceeds the daily limit.		days/yr
F1.1	Performance of the public trans- port system	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop.		%
F2.3	Bicycle network	Length of bicycle paths in the neighbor- hood per inhabitant.		m/inhabitant
G3.1	Availability and proximity of key services	Percentage of inhabitants that are within 800 meters walking distance of at least 3 key services.		%
11.1	Greenhouse gas emissions	Total amount of greenhouse gases (equivalent carbon dioxide units) gen- erated from buildings' operation over a calendar year per inhabitant.		t CO₂ eq./ inhabitant/yr
13.3	Permeability of land	Percentage of weighted ground perme- ability		%

![](_page_62_Picture_9.jpeg)

Sustainable MED Cities

### Visualisation of the sustainability assessment results

![](_page_63_Figure_1.jpeg)

![](_page_63_Picture_2.jpeg)

	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
			SNTool 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

![](_page_64_Picture_1.jpeg)

In-Depth Report: Indicators for Sustainable Cities. Science for Environment Policy. European Commission. https://ec.europa.eu/environment/integration/research/newsalert/index\_en.htm.

ment and Local Government

ment-friendly-city-award.

Vol. 35, No. 4, July 1969.

SNTool MED

![](_page_64_Picture_10.jpeg)

**CESBA MED – Sustainable MED Cities** https://cesba-med.interreg-med.eu/

City sustainability Indicators - World Bank - Urban Develop-

Riccaboni, A., Sachs, J., Cresti, S., Gigliotti, M., Pulselli, R.M. (2020): Sustainable Development in the Mediterranean. Report 2020. Transformations to achieve the Sustainable Development Goals. Siena: Sustainable Development Solutions Network Mediterranean (SDSN Mediterranean).

Istanbul Environment Friendly City Award https://www.unep.org/unepmap/istanbul-environ-

Arnstein, Sherry R. "A Ladder of Citizen Participation," JAIP,

# SNTool MED

Sustainable Neighborhood Tool

![](_page_65_Picture_2.jpeg)

https://www.enicbcmed.eu/projects/sustainable-med-cities