TESTING PROTOCOL

ASSESSMENT REPORT

Version 2.0

Date: 18-10-2018

2.1: To raise capacity for better management of energy in public buildings at transnational level
Work package: WP3 TESTING
Activity: 3.3 Test of transnational assessment methods and indicators
Deliverable: 3.3.1 – Testing Protocol

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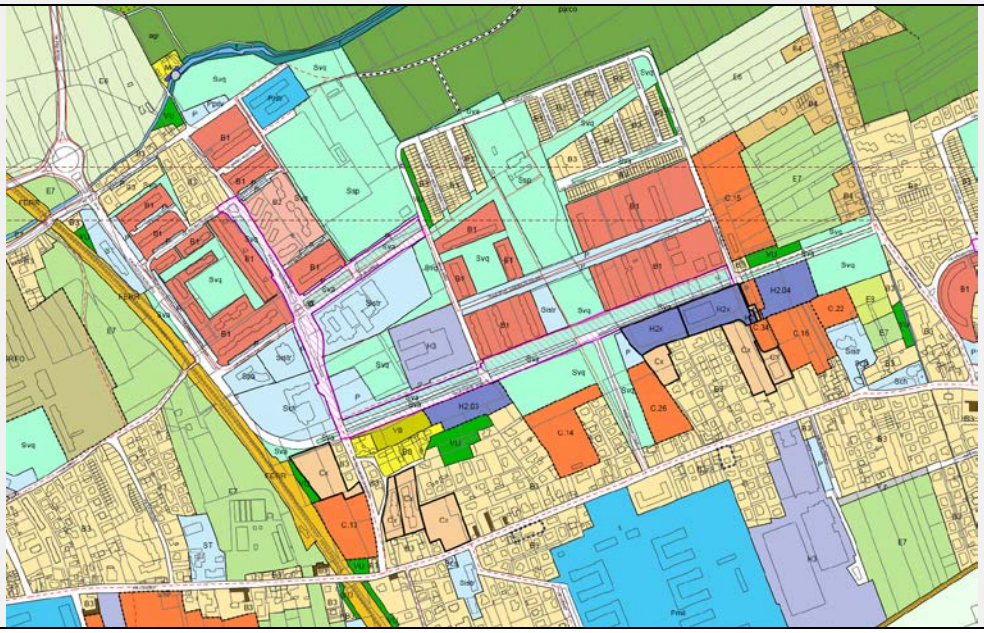
URBAN SCALE ASSESSMENT

1. INITIATION

General information on the selected urban area

City	***Udine**:* *area 5.719.33 ha,* *Resident population: 98287*
Brief description	*Peripheral district in the north-east of the city of Udine. with a population density per square meter equal to:* ***Udine**: - 0,0017 ab/mq,* ***Experimental city**: 0,0043 ab/mq* *The main urban destination is residential with a military area (barracks) now no longer active.*
Size (ha)	***Experimental city**: 109,73 ha (1.097.324,15 mq)*
Residential population	***Experimental city**:* *- 5.246 Resident population: (2011) (ISTAT)* *- 4.455 updated resident population (2018)*
Average building density (total m^2/land surface m^2)	Average density of the building: 0.17 sqm / sqm (total m2 / m2 surface area)
Plan of the urban area	

Significant pictures	Aerial views   
Desciption of the adjacent areas	*The area borders to the north and east with poorly urbanized areas. They are areas with park and agricultural destination. To the south and west, the area is connected to other urbanized areas on the outskirts of the city of Udine.*
Property ownership	*The real estate properties in the area are mixed public and private.*
Social and economic context	*Area with predominantly popular economic construction, a district with a purely working-class and low-income population.*
Legal /administrative boundary lines	*The boundaries of the area correspond to the existing road axes and the limits of the census areas as identified in 2011. The northern border of the area reflects the PEEP EST Aurora boundary.*
Energy supply infrastructure	*The area is completely covered by the methane gas network and the electricity grid.*
Relevance of the surrounding infrastructures	
Reference stakeholders in	*Municipality of Udine and ATER (Territorial Residential Construction Agency)*

retrofit process	
Other significant information	***Periodo di costruzione: Period of construction*** ***Experimental city:*** *Residential buildings built before 1919: 1* *Residential buildings built from 1919 to 1945: 23* *Residential buildings built from 1946 to 1960: 42* *Residential buildings built from 1961 to 1970: 73* *Residential buildings built from 1971 to 1980:25* *Residential buildings built from 1981 to 1990: 34* *Residential buildings built from 1991 to 2000: 27* *Residential buildings built from 2001 to 2005: 6* *Residential buildings built after 2005 and until 2011: 9*

2. PREPARATION

a. SNTool structure

In this section it is described the structure of your SNTool.
Please, enter here the list of the criteria selected from the CESBA MED Generic Framework ay Urban scale.
Please remember that KPIs are mandatory.

A - BUILT URBAN SYSTEMS	
A1	**Urban Structure and Form**
A1.2	*Urban compactness*
A1.4	** Residential density*
A1.7	*Conservation of Land*
A2	**Transportation Infrastructure**
A2.5	*Cyclomatic complexity of the street network*
A2.8	*Scale of the street network*

B - ECONOMY	
B1	**Economic Structure and Value**
B1.1	*Affordability of housing property*
B1.2	*Affordability of housing rental*
B1.6	*Percent of residential units in the neighborhood that are vacant.*
B2	**Economic activity**
B2.3	*Employment rate.*
B3	**Cost and Investment**
B3.3	*Use stage energy cost for public buildings.*

C - ENERGY

C1	**Non-renewable energy**
C1.1	*Total final thermal energy consumption for building operations.*
C1.4	*Total final electrical energy consumption for building operations.*
C1.7	*Total primary energy demand for building operations.*
C1.20	*Energy consumption of public lighting.*
C1.21	*Energy consumption of local public transport.*
C2	**Renewable and Decarbonized energy**
C2.1	*Share of renewable energy on-site, on total final thermal energy consumptions for buildings operation.*
C2.7	*Share of electric energy generation from on-site renewable sources on final electric energy.*

D - ATMOSPHERIC EMISSIONS	
D1	**Atmospheric emissions**
D1.2	*Total GHG Emissions from primary energy used in building operations.*
D1.4	*Aggregate emissions of acidifying emissions during building operations.*

E - NON - RENEWABLE RESOURCES	
E1	**Potable water, stormwater and greywater**
E1.3	*Re-use of rainwater in residential buildings.*
E1.4	*Re-use of rainwater in non-residential building.*
E1.6	*Consumption of potable water for residential population.*
E1.7	*Consumption of potable water for non-residential building systems.*
E1.8	*Consumption of potable water for irrigation purposes.*
E2	**Solid and Liquid Wastes**
E2.1	*Solid waste and recycling collection points.*
E2.6	*Public wastewater that is disposed or treated.*
E3	**Resource consumption, retention and maintenance**
E3.5	*Preservation and maintenance of existing buildings and structures.*

F - ENVIRONMENT	
F1	**Environmental impacts**
F1.3	*Recharge of groundwater through permeable paving or landscaping.*
F1.11	*Albedo*
F2	**Outdoor environmental quality**
F2.3	*Ambient air quality with respect to particulates <10 μm (PM10) over a one-year period.*
F2.11	*Ambient night-time noise conditions.*
F3	**Ecosystems and landscapes**
F3.1	*Green zones & recreation areas availability*
F3.6	*Tree coverage for shade and management of local ambient temperatures.*
F3.7	*Green roofs.*
F3.9	*Presence or potential for wildlife corridors.*

G - SOCIAL ASPECTS	
G1	**Traffic and Mobility Services**
G1.2	*Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.*
G1.3	*Barrier-free accessibility in local outdoor public areas.*
G1.4	*Ease of access to and use of public transport for physically disabled persons..*
G2	**Traffic and Mobility Services**
G2.1	*Performance of the public transport.*
G2.2	*Availability of car sharing services*
G2.4	*Quality of pedestrian and bicycle network.*
G3	**Communication services**
G3.1	*Availability of a broadband communication network*
G4	**Public and private facilities and services**
G4.2	*Availability and proximity of key services*
G4.6	*Availability and proximity of leisure facilities*
G5	**Local Food**
G5.2	*Residents' access to and use of urban agricultural plots.*
G6	**Management and community involvement**
G6.3	*Community involvement in urban planning activities*

b. SNTool criteria selection rationale

In this section PPs must motivate the selection of the criteria that have been included in the SNTool. Why the criterion has been included? The reason could depend on regional policies, targets, specific characteristics of the territory (i.e. touristic area, agricultural area, etc.…).

A - BUILT URBAN SYSTEMS	
CRITERION	**REASON/MOTIVATION**
A1.2 - *Urban compactness*	*Assess the actual consumption and use of land. EMAS declaration 30.06.2017 rev. 13. General urban development plan.*
A1.4 - Residential density	*Analyze the population density to avoid creating "ghetto" areas.*
A1.7 - *Conservation of Land*	*Protect the area with high agricultural and environmental characteristics. EMAS declaration 30.06.2017 rev. 13. General urban development plan.*
A2.5 - *Cyclomatic complexity of the street network*	*Evaluate the network of paths and the ease of access to the various areas.*
A2.8 - *Scale of the street network*	*Evaluate the length of the routes.*

B - ECONOMY	
CRITERION	**REASON/MOTIVATION**
B1.1 - *Affordability of housing property*	*Maintaining a proper ratio between the income of the residents and the purchase cost of the accommodation.*
B1.2 - *Affordability of housing rental*	*Maintaining a proper ratio between the income of the residents and the cost of renting the accommodation.*
B1.6 - *Percent of residential units in the neighbourhood that are vacant.*	*Evaluate hypothesis of abandonment of the area by residents.*
B2.3 - *Employment rate.*	*Evaluate social quality with respect to employment.*
B3.3 - *Use stage energy cost for public buildings*	*Evaluate the impact of energy costs per square meter of public buildings. PAES "Sustainable Energy (and Climate) Action Plan" of 23-07-2010*

C - ENERGY	
CRITERION	**REASON/MOTIVATION**
C1.1 - *Total final thermal energy consumption for building operations.*	*Evaluate the real energy consumption index of the area. PAES "Sustainable Energy (and Climate) Action Plan" of 23-07-2010. Energy regulation.*
C1.4 - *Total final electrical energy consumption for building operations.*	*Evaluate the real electric consumption index of the area. PAES "Sustainable Energy (and Climate) Action Plan" of 23-07-2010.*
C1.7 - *Total primary energy demand for building operations.*	*Evaluate the deviation between the primary reference energy with the calculated primary energy. PAES "Sustainable Energy (and Climate) Action Plan" of 23-07-2010. D.M. Minimum requirements*
C1.20 - *Energy consumption of public lighting.*	*Evaluate the consumption of public lighting. EMAS declaration 30.06.2017 rev. 13.*
C1.21 - *Energy consumption of local public transport.*	*Check the level of sustainability achieved by the consumption of public transport. EMAS declaration 30.06.2017 rev. 13. PAES "Sustainable Energy (and Climate) Action Plan" of 23-07-2010*
C2.1 - *Share of renewable energy on-site, on total final thermal energy consumptions for buildings operation.*	*Evaluate the relationship between renewable and total energy. EMAS declaration 30.06.2017 rev. 13. PAES "Sustainable Energy (and Climate) Action Plan" of 23-07-2010. DLgs 28/11*
C2.7 - *Share of renewable energy on-site, on final electric energy consumptions.*	*Evaluate the percentage of on - site electric renewable energy with respect to the total. EMAS declaration 30.06.2017 rev. 13. PAES "Sustainable Energy (and Climate) Action Plan" of 23-07-2010. DLgs 28/11*

D - ATMOSPHERIC EMISSIONS	
CRITERION	**REASON/MOTIVATION**
D1.2 - *Total GHG Emissions from primary energy used in building operations.*	*Evaluate the level of emissions in relation to the PAES "Sustainable Energy (and Climate) Action Plan" of 23-07-2010*
D1.4 - *Aggregate emissions of acidifying emissions during building operations.*	*Evaluate the impact of other emissions in relation to the ISO 14001 Environmental Certification. PAC (Municipal Action Plan) 4 February 2014.*

E - NON - RENEWABLE RESOURCES

CRITERION	REASON/MOTIVATION
E1.3 - *Re-use of rainwater in residential buildings.*	*Verify the recovery of rainwater in residential buildings. Energy regulation 6 February 2013. EMAS declaration 30.06.2017 rev. 13.*
E1.4 - *Re-use of rainwater in non-residential building.*	*Verify the recovery of rainwater in non-residential buildings. Energy regulation 6 February 2013. EMAS declaration 30.06.2017 rev. 13.*
E1.6 - *Consumption of potable water for residential building systems.*	*Analyze water savings in residential buildings*
E1.7 - *Consumption of potable water for non-residential building systems.*	*Analyze water savings in non-residential buildings*
E1.8 - *Consumption of potable water for irrigation purposes.*	*Check the impact of water consumption for irrigation and rainwater recovery.*
E2.1 - *Solid waste and recycling collection points.*	*Evaluate the quality of the service and the level of recycling. EMAS declaration 30.06.2017 rev. 13.*
E2.6 - *Public wastewater that is disposed or treated.*	*Evaluate the level of treatment of processed and disposed of public waters EMAS declaration 30.06.2017 rev. 13.*
E3.5 - *Preservation and maintenance of existing buildings and structures.*	*Evaluate the level of maintenance quality.*

F - ENVIRONMENT

CRITERION	REASON/MOTIVATION
F1.3 - *Recharge of groundwater through permeable paving or landscaping.*	*Check the capacity of the area to feed the groundwater. UNI PdR 13 ITACA.*
F1.11 - *Albedo*	*Evaluate the quality of the external environment during the summer season. UNI PdR 13 ITACA ...*
F2.3 - *Ambient air quality with respect to particulates <10 µm (PM 10) over a one-year period.*	*Analyze the quality of the air. EMAS declaration 30.06.2017 rev. 13.*
F2.11 - *Ambient night-time noise conditions.*	*Evaluate the level of noise pollution. EMAS declaration 30.06.2017 rev. 13.*
F3.1 - *Green zones & recreation areas availability*	*Evaluate the allocation of Green surfaces. EMAS declaration 30.06.2017 rev. 13.*
F3.6 - ** Tree coverage for shade and management of local ambient temperatures.*	*Evaluate the quality of the Green areas in relation to their usability. Green regulation*
F3.7 - *Green roofs.*	*Encourage the use of green roofs Energy regulation 6 February 2013.*
F3.9 - Presence or potential for wildlife corridors.	*Allow the fauna to be able to populate the various green areas and allow their full use*

G - SOCIAL ASPECTS	
CRITERION	**REASON/MOTIVATION**
G1.2 - *Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.*	*Evaluate the accessibility of the sidewalks by disabled people*
G1.3 - *Barrier-free accessibility in local outdoor public areas.*	*Verify the barrier-free accessibility of public areas.*
G1.4 - *Ease of access to and use of public transport for physically disabled persons.*	*Evaluate the accessibility of public transport by people with disabilities.*
G2.1 - *Performance of the public transport.*	*Analyze the public service in its general aspects EMAS declaration 30.06.2017 rev. 13. PUM Urban Mobility Plan October 2011.*
G2.2 - *Availability of car sharing services*	*Incentive use of car-sharing. EMAS declaration 30.06.2017 rev. 13. PUM Urban Mobility Plan October 2011.*
G2.4 - *Quality of pedestrian and bicycle network.*	*Measure the availability of pedestrian paths and cycle paths. EMAS declaration 30.06.2017 rev. 13. PUM Urban Mobility Plan October 2011.*
G3.1 - *Availability of a broadband communication network*	*Allow access to information and online services Reduce the digital divide. AGICOM.*
G4.2 - *Availability and proximity of key services*	*Evaluate the quality of public human services in the area. EMAS declaration 30.06.2017 rev. 13.*
G4.6 - *Availability and proximity of leisure facilities*	*Analyze the sporting and cultural services in the area. EMAS declaration 30.06.2017 rev. 13.*
G5.2 - *Residents' access to and use of urban agricultural plots.*	*Offer the opportunity to produce garden produce on site and encourage the consumption of vegetables and forms of socialization. Agenda 21. Guidelines "The garden and the moon" by G.C. n. 338 of 1 October 2013.*
G6.3 - *Community involvement in urban planning activities*	*Evaluate the level of community involvement and the actual level of participatory planning. EMAS declaration 30.06.2017 rev. 13. Programmatic declarations of the Mayor of Udine*

c. SNTool weights rationale

In this section PPs must motivate the value of weights assigned to issues, categories and criteria. Why the weight of a particular issue or criterion is higher (or lower)? Weights should reflect the regional political priorities.

ISSUES WEIGHTS

ISSUE	WEIGHTING FACTOR (1 to 3)	MOTIVATION
A - BUILT URBAN SYSTEMS	1	Rigidity of the system
B - ECONOMY	2	Reduced power of intervention - Reduced intervention domain
C - ENERGY	3	Political priority; PAC - PAES - EMAS
D - ATMOSPHERIC EMISSIONS	2	Reduced power of intervention - Reduced intervention domain
E - NON - RENEWABLE RESOURCES	3	Political priority; PAC - PAES - EMAS
F - ENVIRONMENT	2	Reduced power of intervention - Reduced intervention domain
G - SOCIAL ASPECTS	2	Reduced power of intervention - Reduced intervention domain

CATEGORIES WEIGHTS

Note: the categories weight results automatically from the criteria level

CATEGORIES	WEIGHT (%)
A1 - Urban Structure and Form	44,44
A2 - Transportation Infrastructure	55,56
TOTAL	100
B1 - Economic Structure and Value	73,91
B2 - Economic activity	13,04
B3 - Cost and Investment	13,04
TOTAL	100
C1 - Non-renewable energy	68,24
C2 - Renewable and Decarbonized energy	31,76
C3 - Energy recycling and storage	NA
TOTAL	100
D1 - Atmospheric emissions	100
TOTAL	100
E1 - Potable water, stormwater and greywater	55,10
E2 - Solid and Liquid Wastes	32,65
E3 - Resource consumption, retention and maintenance	12,24
TOTAL	100

F1 - Environmental impacts	16,51
F2 - Outdoor environmental quality	41,28
F3 - Ecosystems and landscapes	42,20
TOTAL	100
G1 - Safety and Accessibility	25,35
G2 - Traffic and Mobility Services	29,58
G3 - Communication services	8,45
G4 - Public and private facilities and services	16,90
G5 - Local Food	8,45
G6 - Management and community involvement	11,27
G7 - Society, Culture and Heritage	NA
G8 - Perceptual	NA
TOTAL	100

CRITERIA WEIGHTS

CESBA MED GF-U, sheet WeightsA: B= Impact of the Potential Effect (1-3), C=Extent of potential effect (1-5), D=Duration of potential effect (1-5)

CESBA MED SNTool, sheet WeightsB: LF = Local Factor

A - BUILT URBAN SYSTEMS

A1 - Urban Structure and Form

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
A1.2	*1,73*	*3*	*2*	*4*	*1*	*Confirmed*
A1.4	*1,73*	*3*	*2*	*4*		*Except for the criterion A1.2*
A1.7	*1,15*	*2*	*2*	*4*	*1*	*Confirmed*

A2 - Transportation Infrastructure

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
A2.5	*1,44*	2	*2*	*5*	*1*	*Confirmed*
A2.8	*4,33*	*3*	*4*	*2*	*1*	*Confirmed*
TOTAL	10,38					

B - ECONOMY

B1 - Economic Structure and Value

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
B1.1	*2,60*	*3*	*2*	*3*	*1*	*Confirmed*
B1.2	*1,73*	*3*	*2*	*2*	*1*	*Confirmed*
B1.6	*0,58*	*2*	*2*	*1*		*The lodgings are conventioned building*

B2 - Economic activity

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
B2.3	*0,87*	3	*2*	*1*	*1*	*Confirmed*

B3 – Cost and Investment

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
B3.3	*0,87*	*1*	*2*	*3*	*1*	*Confirmed*
TOTAL	6,63					

C - ENERGY

C1 - Non-renewable energy

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
C1.1	*3,89*	*3*	*2*	*3*	*1*	*Confirmed*
C1.4	*2,60*	*3*	*2*	*2*	*1*	*Confirmed*
C1.7	*2,60*	*3*	*2*	*2*	*1*	*Confirmed*
C1.20	*0,87*	*1*	*2*	*2*		*Shortage of documentation*
C1.21	*2,60*	*2*	*2*	*1*		*Service managed by another body*

C2 - Renewable and Decarbonised energy

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
C2.1	*3,89*	*3*	*2*	*3*	*1*	*Confirmed*
C2.7	*1,95*	*1*	*3*	*3*	*1*	*Confirmed*
TOTAL	18,39					

D - ATHMOSPHERIC EMISSIONS

D1 - Atmospheric emissions

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
D1.2	*10,81*	*3*	*5*	*5*	*1*	*Confirmed*
D1.4	*3,46*	*2*	*4*	*3*	*1*	*Confirmed*
TOTAL	14,28					

E - NON-RENEWABLE RESOURCES

E1 - Potable water, stormwater and greywater

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
E1.3	*1,73*	*2*	*2*	*2*	*1*	*Confirmed*
E1.4	*0,87*	*1*	*2*	*2*	*1*	*Confirmed*
E1.6	*2,60*	*3*	*2*	*2*	*1*	*Confirmed*
E1.7	*0,87*	*1*	*2*	*2*	*1*	*Confirmed*
E1.8	*1,73*	*2*	*2*	*2*		*Large lawn surfaces*

E2 - Solid and Liquid Wastes

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
E2.1	*1,15*	*2*	*2*	*2*	*1*	*Confirmed*
E2.6	*3,46*	*2*	*4*	*3*	*1*	*Confirmed*

E3 - Resource consumption, retention and maintenance

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
E3.5	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*
TOTAL	14,13					

F - ENVIRONMENT

F1 - Environmental impacts

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
F1.3	*0,87*	*1*	*2*	*3*	*1*	*Confirmed*
F1.11	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*

F2 - Outdoor environmental quality

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
F2.3	*3,89*	*3*	*3*	*3*	*1*	*Confirmed*
F2.11	*2,60*	*3*	*2*	*3*		*Lack of punctual data*

F3 - Ecosystems and landscapes

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
F3.1	*1,15*	*2*	*2*	*2*	*1*	*Confirmed*
F3.6	*2,60*	*3*	*2*	*3*		*Large lawn surfaces*
F3.7	*1,15*	*2*	*2*	*2*		*Seismic zone no increase in coverage load*
F3.9	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*
TOTAL	15,72					

G - SOCIAL ASPECTS

G1 - Safety and Accessibility

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
G1.2	*1,73*	*2*	*2*	*3*		*Data not available*
G1.3	*1,73*	*2*	*2*	*3*		*Data not available*
G1.4	*1,73*	*2*	*2*	*3*		*Data not available*

G2 - Traffic and Mobility Services

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
G2.1	*2,60*	*3*	*2*	*3*	*1*	*Confirmed*
G2.2	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*
G2.4	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*

G3 - Communication services

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
G3.1	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*

G4 - Public and private facilities and services

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
G4.2	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*
G4.6	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*

G5 - Local Food

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
G5.2	*1,73*	*2*	*2*	*3*	*1*	*Confirmed*

G6 - Society, Culture and Heritage

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
G6.3	*2,31*	*2*	*2*	*4*	*1*	*Confirmed*
TOTAL	20,48					

d. SNTool benchmarks rationale

In this section PPs must motivate 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. Please keep in mind that score 3 represents a best practice performance. Score 5 is an excellent performance.

A - URBAN STRUCTURE AND FORM				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
A1.2	***Urban compactness***	m^3 / m^2	*0: 1,0*	*maximum index of extensive zones*
			5: 3,5	*Maximum territorial Index PRGC*
A1.4	***Residential density***	Pp/ha	*0: 40*	*Average value of the city*
			5: 300	*Assumption of doubling the value of Aurora neighborhood*
A1.7	***Conservation of Land***	%	*0: 7*	*Real data of the neighborhood*
			5: 42	*Global data of the city*
A2.5	***Cyclomatic complexity of the street network***	n	*0: 30*	-
			5: 100	-
A2.8	***Scale of the street network***	m	*0: 160*	*Walking path in two minutes*
			5: 80	*walking path in one minutes*

B - ECONOMY				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
B1.1	***Affordability of housing property***	%	*0: 18*	-
			5: 25	-
B1.2	***Affordability of housing rental***	%	*0: 18*	-
			5: 25	-
B1.6	***Percent of residential units in the neighbourhood that are vacant***	%	*0: 4*	-
			5: 2	-
B2.3	***Employment rate.***	%	*0: 65*	*FVG employment rate 2018*
			5: 98	*Physiological value 2%*
B3.3	***Use stage energy cost for public buildings***	Euro/m^2/year	*0: 10*	*Current basic data*
			5: 3	*Passive or NZEB Building*

C - ENERGY				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
C1.1	***Total final thermal energy consumption for building operations.***	kWh/m^2/year	*0: 80*	*Current index*
			5: 10	*Energy regulation*
C1.4	***Total final electrical energy consumption for building operations.***	kWh/m2	*0: 23*	-
			5: 5	-
C1.7	***Total primary energy demand for building operations.***	kWh/m^2/year	*0: 72*	*D.M. Minimum requirements*
			5: 50	-
C1.20	***Energy consumption of public lighting.***	kWh/m2	*0: 56*	*Present value*
			5: 16	*PAES value*
C1.21	***Energy consumption of local public transport.***	Pax.km/Mj	*0: 500*	-
			5: 1000	-
C2.1	***Share of renewable energy on-site, on total final thermal energy consumptions for buildings operation.***	%	*0: 25*	*D.Lgs 28/11*
			5: 50	-
C2.7	***Share of renewable energy on-site, on final electric energy consumptions***	%	*0: 35*	-
			5: 75	-

D - ATMOSPHERIC EMISSIONS				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
D1.2	***Total GHG Emissions from primary energy used in building operations.***	kg CO_2 eq,/ m^2/year	*0: 13*	*D.M. Minimum requirements*
			5: 11	*PAES value*
D1.4	***Aggregate emissions of acidifying emissions during building operations.***	g / 1000 m2	*0: 120*	*The data is confirmed*
			5: 18	*PAES savings 40%*

E - NON-RENEWABLE RESOURCES				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
E1.3	***Re-use of rainwater in residential buildings.***	%	*0: 10*	*The data is confirmed*
			5: 60	*The data is confirmed*
E1.4	***Re-use of rainwater in non-residential building.***	%	*0: 10*	*The data is confirmed*
			5: 80	*The data is confirmed*
E1.6	***Consumption of potable water for residential population.***	m^3/occupant/year	*0: 47,450*	*ITACA standard value*
			5: 23,700	*With best performance at 50% on the standard*
E1.7	***Consumption of potable water for non-residential building systems.***	m^3/m^2	*0: 1,3*	*Standard UNI PdR ITACA not residential*
			5: 0,6	*Best UNI PdR ITACA not residential*
E1.8	***Consumption of potable water for irrigation purposes.***	m^3/1000m2	*0: 300*	*UNI PdR ITACA not residential*
			5: 0	*Total recovery*
E2.1	***Solid waste and recycling collection points.***	%	*0: 70*	*Current neighborhood data*
			5: 98	*Expected coverage*
E2.6	***Public wastewater that is disposed or treated.***	%	*0: 90*	*The data is confirmed*
			5: 100	*All the waters are processed*
E3.5	***Preservation and maintenance of existing buildings and structures.***	benchmark text scale	*0: 0*	*Maintenance standard*
			5: 5	*High quality interventions*

F - ENVIRONMENT				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
F1.3	***Recharge of groundwater through permeable paving or landscaping.***	%	*0: 40*	*UNI PdR ITACA*
			5: 60	*UNI PdR ITACA*
F1.11	***Albedo***	%	*0: 0*	*UNI PdR ITACA*
			5: 100	*UNI PdR ITACA*
F2.3	***Ambient air quality with respect to particulates <10 µm (PM10) over a one-year period.***	day/year	*0: 35*	*Average annual limit*
			5: 0	*Value 3 = 35* ug/m3 -

				EMAS
F2.11	***Ambient night-time noise conditions.***	%	*0: -*	-
			5: -	-
F3.1	***Green zones & recreation areas availability***	m2/inhab	*0: 20*	*ISTAT value about city of Udine*
			5: 75	-
F3.6	***Tree coverage for shade and management of local ambient temperatures.***	%	*0: -*	-
			5: -	-
F3.7	***Green roof***	%	*0: -*	-
			5: -	-
F3.9	***Presence or potential for wildlife corridors.***	benchmark text scale	*0: 0*	*Traffic with low traffic*
			5: 5	*Specific design.*

G - SOCIAL ASPECTS

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
G1.2	***Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.***	%	*0: -*	-
			5: -	-
G1.3	***Barrier-free accessibility in local outdoor public areas.***	%	*0: -*	-
			5: -	-
G1.4	***Ease of access to and use of public transport for physically disabled persons.***	%	*0: -*	-
			5: -	-
G2.1	***Performance of the public transport.***	%	*0: 60*	*The data is confirmed*
			5: 100	*Total coverage*
G2.2	***Availability of car sharing services***	%	*0: 1*	*The data is confirmed*
			5: 20	*The data is confirmed*
G2.4	***Quality of pedestrian and bicycle network.***	m/100 inhabitants	*0: 43*	*Average data of the city*
			5: 129	*PUM forecast*
G3.1	***Availability of a broadband communication network***	%	*0: 50*	*Minimum coverage required by the broadband strategy*
			5: 100	*Cancellation of the digital divide*
G4.2	***Availability and proximity of key services***	%	*0: 30*	*The data is confirmed*
			5: 80	*The data is confirmed*

G4.6	***Availability and proximity of leisure facilities***	%	*0: 20*	*The data is confirmed*
			5: 40	*The data is confirmed*
G5.2	***Residents' access to and use of urban agricultural plots.***	%	*0: 20*	*Analogy with criterion G4.6*
			5: 40	*Analogy with criterion G4.6*
G6.3	***Community involvement in urban planning activities***	-	*0: 3*	*Tokenism degree - minimum 3 - information*
			5: 9	*Total control of citizens from project to project delivery 9*

e. SNTool Criteria Specifications

In this section PPs must indicate for each selected criterion:

- *Information source: The source of the data/information that will be used to characterize the value of the indicator. Example: monitored data, measured data, statistic data, models and simulation, studies, data banks, etc.*
- *Assessment method: Short and concise description of the assessment method used to verify the value of indicators. Example: calculation steps, data analysis process, monitoring procedure, content of a study, use of statistic data, etc.*
- *Standards: technical documents taken as reference for the assessment method.*

A - BUILT URBAN SYSTEMS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
A1.2	***Urban compactness***	*Information source*	*CTRN - tema: edifici - Edificato CTRN 5000 - 2° Edizione - Edificato 066 Census areas - 2011*
		Assessment method	*Calculated the area of the scope and the volumes by reprocessing volumes to deduce the surface of the eaves.*
		Standard	*Rules of the General urban development plan*
A1.7	***Conservation of Land***	*Information source*	*Full Surface area - census areas.*
		Assessment method	*To relate the total surface with respect to the ecological value of the neighborhood area.*
		Standard	*Present value of the district*
A2.5	***Cyclomatic complexity of the street network***	*Information source*	*Database Regione Friuli Venezia Giulia - Road segment*
		Assessment method	*Evaluate the number of segments that connect the individual nodes*
		Standard	*I keep the present data*
A2.8	***Scale of the street network***	*Information source*	*Evaluate the ease of access to the various areas of the neighborhood*
		Assessment method	*Ratio between length and number of segments*
		Standard	*Walking path in two minutes (UNI PdR_13 ITACA Residential)*

B - ECONOMY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
B1.1	***Affordability of housing property***	*Information source*	*OMI Observatory trades*
		Assessment method	*Ratio between income and purchase value*
		Standard	*-*
B1.2	***Affordability of housing rental***	*Information source*	*OMI Observatory trades*
		Assessment method	*Ratio between income and rent value*
		Standard	*-*
B2.3	***Employment rate.***	*Information source*	*ISTAT index*
		Assessment method	*Relationship between people in working age and employed*
		Standard	*FVG 2018 employment rate*
B3.3	***Use stage energy cost for public buildings***	*Information source*	*Energy costs from bills*
		Assessment method	*Ratio between energy cost and net area of public buildings exceeding 1000 square meters*
		Standard	*Current value of consumption*

C - ENERGY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
C1.1	***Total final thermal energy consumption for building operations.***	*Information source*	*Energy consumption data*
		Assessment method	*Calculate the annual consumption and divide it by the net area of the buildings*
		Standard	*Current value*
C1.4	***Total final electrical energy consumption for building operations.***	*Information source*	*Energy consumption data*
		Assessment method	*Calculate the annual consumption and divide it by the net area of the buildings*
		Standard	*Current value*
C1.7	***Total primary energy demand for building operations.***	*Information source*	*APE Energy Performance Certification*
		Assessment method	*Calculate the standard consumption and compare it to the reference standard consumption*
		Standard	*References of the law*
C2.1	***Share of renewable energy on-site, on total final thermal energy consumptions for buildings operation.***	*Information source*	*APE Energy Performance Certification*
		Assessment method	*Calculate the consumption of renewable energy in relation to total energy consumption*
		Standard	*References of the law*
C2.7	***Share of renewable energy on-site, on final electric energy consumptions.***	*Information source*	*APE Energy Performance Certification*
		Assessment method	*Calculate the consumption of renewable electricity in relation to total electricity consumption*
		Standard	*Reference of the law*

D - ATMOSPHERIC EMISSIONS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
D1.2	***Total GHG Emissions from primary energy used in building operations.***	*Information source*	*APE Energy Performance Certification*
		Assessment method	*Calculate standard CO2 emitted*
		Standard	*References of the law*
D1.4	***Aggregate emissions of acidifying emissions during building operations.***	*Information source*	*Energy bills*
		Assessment method	*Calculate the emissions of individual fuels by normalizing them and dividing by the useful surfaces of buildings*
		Standard	*The data is accepted*

E - NON-RENEWABLE RESOURCES			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
E1.3	***Re-use of rainwater in residential buildings.***	*Information source*	*Numerical regional technical map. Building authorizations*
		Assessment method	*Calculate the ratio between the amount of rainwater and the recoverable one*
		Standard	*The data is accepted*
E1.4	***Re-use of rainwater in non-residential building.***	*Information source*	*Numerical regional technical map. Building authorizations*
		Assessment method	*Calculate the ratio between the amount of rainwater and the recoverable one*
		Standard	*The data is accepted*
E1.6	***Consumption of potable water for residential population.***	*Information source*	*Water suppliers*
		Assessment method	*Amount of water consumed*
		Standard	*130 lt/gg from UNI PdR_13 ITACA*
E1.7	***Consumption of potable water for non-residential building systems.***	*Information source*	*Water suppliers*
		Assessment method	*Ratio between consumption in mc and the net area in square meters of buildings*
		Standard	*1,3* m^3/m^2

		Information source	*Waste plan and on-site relief of containers*
E2.1	***Solid waste and recycling collection points.***	*Assessment method*	*Percentage of the population at a distance of 100 m from the containers*
		Standard	*Current neighborhood data*
		Information source	*Water suppliers*
E2.6	***Public wastewater that is disposed or treated.***	*Assessment method*	*Ratio between treated water and produced water*
		Standard	*Standard not present at least 90%*
		Information source	*Projects or interventions performed*
E3.5	***Preservation and maintenance of existing buildings and structures.***	*Assessment method*	*Evaluation of the maintenance standard*
		Standard	*Typical regional ordinary maintenance*

F - ENVIRONMENT			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
F1.3	***Recharge of groundwater through permeable paving or landscaping.***	*Information source*	*Census territorial area.* *Urban furniture projects.* *Orthophotographic images.*
		Assessment method	*Calculate the ratio of the permeable surface to the total.*
		Standard	*40% - UNI PdR_13 ITACA*
F1.11	***Albedo***	*Information source*	*Census territorial area.* *Urban furniture projects.* *Orthophotographic images.*
		Assessment method	*Calculate the ratio of the weighted surface according to the reflection coefficient and the total*
		Standard	*0% - UNI PdR_13 ITACA*
F2.3	***Ambient air quality with respect to particulates <10 µm (PM10) over a one-year period.***	*Information source*	*ARPA source data*
		Assessment method	*Annual average of the pollutant*
		Standard	*35 gg/year* *40 µg / m3 - Law limit*

F3.1	***Green zones & recreation areas availability***	*Information source*	*Census scope* *General urban development plan* *Municipal registry office*
		Assessment method	*Divide the green area for the resident population*
		Standard	*ISTAT Index Municipality of Udine*
F3.9	***Presence or potential for wildlife corridors.***	*Information source*	*General urban development plan*
		Assessment method	*Evaluation of connections between the various green areas*
		Standard	*Few opportunities to establish natural corridors.*

G - SOCIAL ASPECTS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
G2.1	***Performance of the public transport.***	*Information source*	*Numeric Regional Technical Map - Road axes - House numbers - Municipal registry office. Public transport timetables.*
		Assessment method	*Percentage of the population at 400 m from the nearest public transport*
		Standard	*-*
G2.2	***Availability of car sharing services***	*Information source*	*List of users of the service*
		Assessment method	*Percentage of the population that used the service in a year*
		Standard	*1% Analogy with Bikesharing service*
G2.4	***Quality of pedestrian and bicycle network.***	*Information source*	*Numeric Regional Technical Map - Axes - Signage survey*
		Assessment method	*Ratio between the linear meters of the cycle/ pedestrian paths and inhabitants*
		Standard	*43 m/100 inhab - Average city data*
G3.1	***Availability of a broadband communication network***	*Information source*	*Technical Numeric Regional Map* *AGCOM mapping networks*
		Assessment method	*Ratio between the resident population and the population reached by the equivalent broadband according to the quality of the service.*
		Standard	*Italian broadband strategy*

G4.2	***Availability and proximity of key services***	*Information source*	*Analysis of local services*
		Assessment method	*Calculation of the population with a maximum of 800 meters walking distance from three services*
		Standard	*-*
G4.6	***Availability and proximity of leisure facilities***	*Information source*	*Local analysis of services*
		Assessment method	*Calculation of the population with a maximum of 1000 meters walking distance from at least one service for the two categories, cultural and sports*
		Standard	*-*
G5.2	***Residents' access to and use of urban agricultural plots.***	*Information source*	*Project Urban gardens*
		Assessment method	*Percentage of the population within 1 km from urban vegetable garden*
		Standard	*-*
G6.3	***Community involvement in urban planning activities***	*Information source*	*Minutes of meetings, press articles, reports, initiatives*
		Assessment method	*Activity comparison with Sherry Arnstein scale*
		Standard	*-*

3. DIAGNOSIS

a. Performance scores

Evaluation of the actual performance and relative level of sustainability of the urban area. PPs have to indicate the scores reached.

	SCORE
A - BUILT URBAN SYSTEMS	
A1 - Urban Structure and Form	
A1.2 - Urban compactness	2,0
A1.7 - Conservation of Land	0,1
A2 - Transportation Infrastructure	
A2.5 - Cyclomatic complexity of the street network	0.9
A2.8 - Scale of the street network	3,4
B - ECONOMY	
B1 - Economic Structure and Value	
B1.1 - Affordability of housing property	-1
B1.2 - Affordability of housing rental	0,7
B2 - Economic activity	
B2.3 - Employment rate.	2,6
B3 - Cost and Investment	
B3.3 - Use stage energy cost for public buildings	0,2
C - ENERGY	
C1 - Non-renewable energy	
C1.1 - Total final thermal energy consumption for building operations.	0,6
C1.4 - Total final electrical energy consumption for building operations.	1,5
C1.7 - Total primary energy demand for building operations.	-1
C2 - Renewable and Decarbonised energy	
C2.1 - Share of renewable energy on-site, on total final thermal energy consumptions for buildings operation.	-1
C2.7 - Share of renewable energy on-site, on final electric energy consumptions.	-1
D - ATMOSPHERIC EMISSIONS	
D1 - Atmospheric emissions	
D1.2 - Total GHG Emissions from primary energy used in building operations.	-1
D1.4 - Aggregate emissions of acidifying emissions during building operations.	4,4
E - NON RENEWABLE SOURCES	
E1 - Potable water, stormwater and greywater	
E1.3 - Re-use of rainwater in residential buildings.	-1
E1.4 - Re-use of rainwater in non-residential building.	-1
E1.6 - Consumption of potable water for residential population.	-1
E1.7 - Consumption of potable water for non-residential building systems.	2,7
E2 - Solid and Liquid Wastes r	
E2.1 - Solid waste and recycling collection points.	0,5
E2.6 - Public wastewater that is disposed or treated.	5,0
E3 - Resource consumption, retention and maintenance	
E3.5 - Preservation and maintenance of existing buildings and structures.	0

F - ENVIRONMENT	
F1 - Environmental impacts	
F1.3 - Recharge of groundwater through permeable paving or landscaping.	5,0
F1.11 - Albedo	3,3
F2 - Outdoor environmental quality	
F2.3 - Ambient air quality with respect to particulates <10 µm (PM 10) over a one-year period.	1,9
F3 - Ecosystems and landscapes	
F3.1 - Green zones & recreation areas availability	4,2
F3.9 - Presence or potential for wildlife corridors.	0
G - SOCIAL ASPECTS	
G2 - Traffic and Mobility Services	
G2.1 - Performance of the public transport.	3,8
G2.2 - Availability of car sharing services	-1
G2.4 - Quality of pedestrian and bicycle network.	2,4
G3 - Communication services	
G3.1 - Availability of a broadband communication network	2,7
G4 - Public and private facilities and services	
G4.2 - Availability and proximity of key services	5
G4.6 - Availability and proximity of leisure facilities	5
G5 - Local Food	
G5.2 - Residents' access to and use of urban agricultural plots.	-1
G6 - Management and community involvement	
G6.3 - Community involvement in urban planning activities	0

b. Key Performance Indicators value

KPI	Indicator	Unit of measure	Value
A1.7 - Conservation of Land	Area of undeveloped land with ecological or agricultural value / area of the neighborhood	%	7,20
B3.3 - Use stage energy cost for public buildings	Aggregated annual operating energy cost per aggregated indoor useful floor area	Euro/m^2/year	9,7
C1.1 - Total final thermal energy consumption for building operations	Aggregated annual total final thermal energy consumption per aggregated indoor useful floor area	kWh/m^2/year	76,26
C1.4 - Total final electric energy consumption for building operations	Aggregated annual total final electric energy consumption per aggregated indoor useful floor area	kWh/m^2/year	17,43
C1.7 - Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area	kWh/m^2/year	181,06
C2.1 - Share of renewable energy on-site, on total final thermal energy consumptions for buildings operation	Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy consumption	%	3,01
C2.7 - Share of renewable energy on-site, on final electric energy consumptions	Share of renewable electric energy in final electric energy consumptions	%	3,11
D1.2 - Total GHG Emissions from primary energy used in building operations	CO_2 equivalent emissions per useful internal floor area per year	kg CO_2 eq./m^2/yr	34,36
E1.6 - Consumption of potable water for residential population	Annual potable water consumption per occupant	m^3/occupant/year	48,680
E1.7 - Consumption of potable water for non-residential building systems	Annual water consumption per occupant	m^3/m^2	0,924
F1.3 - Recharge of groundwater through permeable paving or landscaping	Area of permeable surfaces on total neighborhood area	%	61,03
F2.3 - Ambient air quality with respect to particulates <10 µm (PM10) over a one year period	Number of days exceeding the daily limits in a year	days/year	22
G2.1 - Performance of the public transport	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop.	%	90,08
G2.4 - Quality of pedestrian and bicycle network	Total walkway meters of dedicated pedestrian paths and meters of bicycle path and “shared space” per 100 inhabitants.	m/100 inhabitants	84,89
G4.2 - Availability and proximity of key services	Percentage of inhabitants that are within 800 meters walking distance of at least 3 key services	%	97,33
G6.3 - Community involvement in urban planning activities	Level of involvement of users in urban planning	Level (score)	0

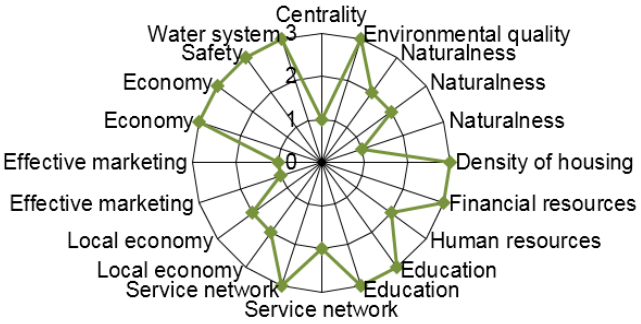
c. SWOT analysis

Where are we now ?

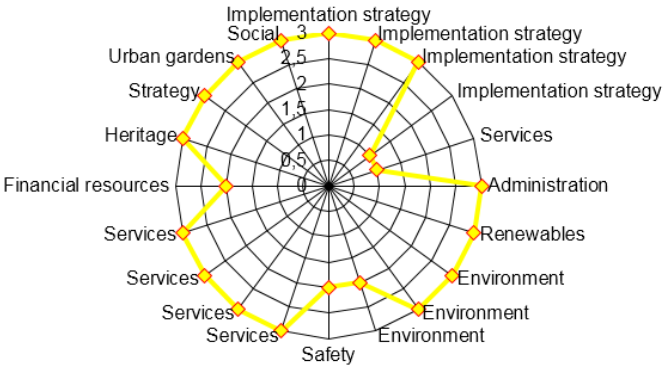
A SWOT analysis is a study undertaken to identify its strengths, weaknesses, available opportunities, and possible threats. The analysis is based on a quadrant matrix, in which strengths and weaknesses (internal factors) are presented above the x-axis, and opportunities and threats (external factors) are presented below. Typically, strengths and opportunities (positive factors) are listed on the left of the y-axis, while weaknesses and threats (negative factors) are listed on the right.

STRENGTHS	WEAKNESSES
- Peripheral geographical position and good environmental quality - Reduced land consumption for building purposes - We have adequate financial resources - Presence of education centers - Contact between different cultures - Well-developed infrastructures (water supply, digital networks) - Reduce operational energy costs of public buildings - Reduce energy costs in residential housing structures - Improve public lighting to increase the perception of security - Large public areas suitable for the reuse of rainwater	- Difficulty performing retrofit work on private buildings - We are not able to activate water saving strategies - Difficulty in applying the technique of green roofs - Reduce energy consumption by increasing service quality - We are not able to supply energy from renewable sources - We have little impact on acidifying emissions and ozone in the atmosphere - Maintenance of ecological continuity - Inadequacy localization of functions - Decrease of public transport travel on public holidays - Poor accessibility for the disabled, the visually impaired - Distance from car sharing services - Poor quality of settlement - Little involvement of the population in the political choices - Access to urban gardens in authorized area - Loneliness and isolation of the elderly
OPPORTUNITIES	**THREATS**
- Reduce the operational energy costs of public buildings - Support from the central government and from external donors / investors - Disused areas as opportunities to experiment with new settlement models - Recovery of buildings and public areas abandoned by other activities	- The seismic adjustment requirements become onerous - Delay in carrying out financed interventions - Concentration of discomfort - Operate without involving the inhabitants in future choices

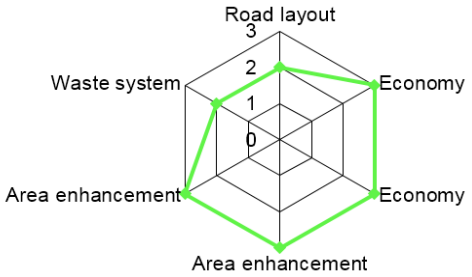
STRENGHTH RATING



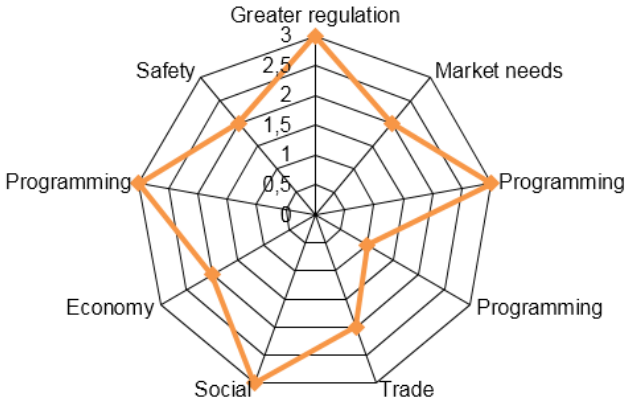
WEAKNESSES RATING



OPPORTUNITIES RATING



THREATS RATING



4. STRATEGIC DEFINITION

a. Performance targets

The overall Environmental, Social and Economic targets have to be described

Environmental targets	• Limit land consumption by favoring the reuse and recovery of buildings and empty areas, reducing the areas of residential expansion; • Connect 100% of homes to the integrated water cycle; • Enhancing and strengthening the urban green space and city parks as biodiversity corridors and places of aggregation and supporting the quality of relationships in local communities; • Support the use of renewable sources such as solar thermal and photovoltaic, mini-hydroelectric, geothermal, biomass of public parks, district heating; • Maintaining the obligation to increase the energy efficiency of buildings, for the construction of "almost zero" energy buildings and for the renovation of old houses and to introduce incentives for this purpose; • Complete maintenance programs for safety and energy efficiency of school facilities and minor sports facilities; • Extend the energy certification of buildings to an environmental assessment of the building system - urban area by introducing it into the planning tools of the institution. *(EMAS n. rev, 13)*
Social targets	• Enhance the towns and neighborhoods of the city by favoring the decentralization of services; • Implement sustainable mobility to improve air quality and acoustic climate through Traffic Plans; • Promote public transport, use of the bicycle and pedestrian traffic, extending the network of cycle paths, increasing the number of "bike seats" in the city, razionalizing traffic in the historic center, expanding the pedestrian area and enhancing Piazza 1 ° Maggio; • Lines and routes of the TPL must be redefined in line with the pedestrianization of the historic center, reviewing the parking network in the structure, flush and exchangers and the related tariffs, promoting new modes of public transport with the call service and new modes of private transport with electric vehicles; • Strengthen the control activities of local police on the territory for urban safety and decorum;

	• Promote the wellbeing of citizens with initiatives in favor of active lifestyles, both from a physical and social point of view, with attention to the environment and to nutrition; *(EMAS n. rev, 13)*
Economy targets	• Investing in energy issues through the actions of the Municipal Energy Plan. *(EMAS n. rev, 13)* • Create the conditions to organize purchasing groups of photovoltaic / solar thermal systems. *(PAES giugno 2010)* • It is also our intention to be an active part in the establishment of the "Table of Poverty", made up of institutional and private subjects, with the aim of intercepting families hard hit by the economic crisis or other critical factors, which need economic and social support; • We do not want to renew the AURA project in order to discourage the distribution of immigrants waiting for recognition in the apartments, to recreate a peaceful climate in many condominiums of the city and to stem the real estate devaluation that has already affected large areas of Udine. *(Dichiarazioni programmatiche del Sindaco Pietro Fontanini – 2018)*

Each partner must establish a target value for each criterion in the SNTool reflecting the overall targets..

A - BUILT URBAN SYSTEMS			
A1 - Urban Structure and Form			
A1.2 - Urban compactness		Actual value	2,01
Relation between the usable space of the buildings (volume) and the urban space (area).	mc/mq	Target value	3,5
A1.7 - *Conservation of Land*		Actual value	7,20
Undeveloped land considered to be of value for ecological or agricultural purposes.	%	Target value	20
A2 - Transportation Infrastructur			
A2.5 - Cyclomatic complexity of the street network		Actual value	43
Cyclomatic number	-	Target value	50
A2.8 - Scale of the street network		Actual value	104,85
Average distance between the intersections of the area	m	Target value	100,00

B - ECONOMY			
B1 - Economic Structure and Value			
B1.1 - Affordability of housing property		Actual value	17,51
Housing properties in the local area that are financially accessible for purchase by the lowest 50% of the area population.	%	Target value	22
B1.2 - Affordability of housing rental		Actual value	19,01
Percentage of the average salary of the lowest quintile of the population used for rental payments.	5	Target value	26
B2 - Economic activity			
B2.3 - Employment rate.		Actual value	82.48
Percent of working age adults in the local area who are employed or actively looking for work.	%	Target value	95
B3 - Cost and Investment			
B3.3 - Use stage energy cost for public buildings		Actual value	9,7
Aggregated annual operating energy cost per aggregated indoor useful floor area	Euro/m^2/year	Target value	5,8

C - ENERGY			
C1 - Non-renewable energy			
C1.1 - Total final thermal energy consumption for building operations.		Actual value	76,26
Aggregated annual total final thermal energy consumption per aggregated indoor useful floor area	kWh/m^2/year	Target value	45
C1.4 - Total final electrical energy consumption for building operations.		Actual value	17,43
Aggregated annual total final electric energy consumption per aggregated indoor useful floor area	kWh/m^2/year	Target value	12
C1.7 - Total primary energy demand for building operations.		Actual value	182,72
Aggregated annual total primary energy consumption per aggregated indoor useful floor area	kWh/m^2/year	Target value	58.80
C2 - Renewable and Decarbonised energy			
C2.1 - Share of renewable energy on-site, on total final thermal energy consumptions for buildings operation.		Actual value	3,01
Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy consumption	%	Target value	35
C2.7 - Share of renewable energy on-site, on final electric energy consumptions.		Actual value	3,11
Share of renewable electric energy in final electric energy consumptions.	%	Target value	57

D - ATMOSPHERIC EMISSIONS			
D1 - Atmospheric emissions			
D1.2 - Total GHG Emissions from primary energy used in building operations.		Actual value	34,36
CO_2 equivalent emissions per useful internal floor area per year	kg CO_2 eq./ m^2/year	Target value	11.80
D1.4 - Aggregate emissions of acidifying emissions during building operations.		Actual value	31,2
Percentage of acidifying emissions over a 5-year period.	g/1000 / m^2	Target value	25

E - NON RENEWABLE SOURCES			
E1 - Potable water, stormwater and greywater			
E1.3 - Re-use of rainwater in residential buildings.		Actual value	0
Share of rainwater collected from roofs of residential buildings.	%	Target value	50
E1.4 - Re-use of rainwater in non-residential building.		Actual value	0
Share of rainwater collected from roofs of non residential buildings.	%	Target value	50
E1.6 - Consumption of potable water for residential population.		Actual value	48,680
Annual potable water consumption per occupant	m^3/occupant/year	Target value	33,220
E1.7 - Consumption of potable water for non-residential building systems.		Actual value	0,924
Annual water consumption per occupant.	m^3/m^2	Target value	0,9
E2 - Solid and Liquid Wastes			
E2.1 - Solid waste and recycling collection points.		Actual value	72,75
Proximity of the resident population to the solid waste and recycling collection point (100 m).	%	Target value	85
E2.6 - Public wastewater that is disposed or treated.		Actual value	100
Percent of public wastewater that is disposed or treated.	%	Target value	100
E3 - Resource consumption, retention and maintenance			
E3.5 - Preservation and maintenance of existing buildings and structures.		Actual value	0
The percent of existing buildings and structures in the local area not requiring demolition, that have been preserved and maintained in full operating condition.	-	Target value	3

F - ENVIRONMENT			
F1 - Environmental impacts			
F1.3 - Recharge of groundwater through permeable paving or landscaping.		Actual value	61,03
Area of permeable surfaces on total neighborhood area	%	Target value	50
F1.11 - Albedo		Actual value	65,21
Albedo of the outer surfaces in the area.	%	Target value	60
F2 - Outdoor environmental quality			
F2.3 - Ambient air quality with respect to particulates <10 μm (PM 10) over a one-year period.		Actual value	22
Number of days exceeding the daily limits in a year	day/year	Target value	14,00

F3 - Ecosystems and landscapes			
F3.1 - Green zones & recreation areas availability		Actual value	66,35
Availability of green zones & recreation areas	mq/inhab	Target value	70
F3.9 - Presence or potential for wildlife corridors.		Actual value	0
Continuity of green areas to support small wildlife.	-	Target value	3

G - SOCIAL ASPECT			
G2 - Traffic and Mobility Services			
G2.1 - Performance of the public transport.		Actual value	90,08
Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop.	%	Target value	95
G2.2 - Availability of car sharing services		Actual value	0
Resident and working population using car sharing services.	%	Target value	10
G2.4 - Quality of pedestrian and bicycle network.		Actual value	84,89
Total walkway meters of dedicated pedestrian paths and meters of bicycle path and “shared space” per 100 inhabitants.	m /100 inhabitants	Target value	110
G3 - Communication services			
G3.1 - Availability of a broadband communication network		Actual value	77,43
Percentage of population covered compared to the equivalent population depending on the quality of service	%	Target value	85
G4 - Public and private facilities and services			
G4.2 - Availability and proximity of key services		Actual value	97,33
Percentage of inhabitants that are within 800 meters walking distance of at least 3 key services.	%	Target value	60
G4.6 - Availability and proximity of leisure facilities		Actual value	96,12
Percent of residential buildings located within a distance of 1 km of public or commercial leisure facilities.	%	Target value	30
G5 - Local Food			
G5.2 - Residents' access to and use of urban agricultural plots.		Actual value	0
Percentage of the population with access to public urban agricolture plots.	%	Target value	30
G6 - Management and community involvement			
G6.3 - Community involvement in urban planning activities		Actual value	4
Level of user involvement in urban planning (expanded).	-	Target value	6

b. Constraints and restrictions

CONSTRAINTS / RESTRICTIONS	
Legal constraints	*P.R.G.C. current and Building Regulations. Communication of the 19/08/2016 of the Archaeological, fine Arts and Landscape Supervision Office of Friuli Venezia Giulia. Memorandum of understanding with Udine Prefecture*
Technical constraints	*-*
Financial constraints	*Announcement for the preparation of the extraordinary program of intervention for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978. "Experimental City" provides 18 public works to be realized autonomously for a total of € 17,550,000 and an action for € 750,000 proposed together with AcegaApsAmga, through an operating agreement, aimed to increase the safety (public lighting with very low consumption and remote control, vehicle license plate control, video surveillance, safety of pedestrian crossings with new systems, etc.). The total cost of the project is estimated at € 29.86 million.*
Environmental condition constraints	*-*
Stakeholder based restrictions	*Company Ferrovie Udine Cividale s.r.l. - project for the construction of the "San Gottardo" intermodal passenger center; FIAB Udine / Abicitudine Association - project for bicycle repair; Macross Association - project for new cohousing strategies; design, constitution and management of cultural artistic activities; AcegasApsAmga S.p.A. - project for the realization of "Smart City" technological systems and integration with public facilities lighting; Rugby Udine Union FVG s.r.l. - participation in the Educational Sports Table; ATER Udine - project for urban redevelopment and enhancement of the territorial security of the "Aurora" district for a "new way of living"in public housing; UISP Udine - management project for the practice of competitive sports, amateur, school, cultural and recreational activities; FININT SGR S.p.A. - project for the construction of 80 apartments in the former Osoppo Barracks*
Other relevant constraints	*-*

5. DECISION MAKING

a. Description of scenarios

NAME OF SCENARIO	DESCRIPTION
1. ExperimentalCIty	Experimental city beyond the boundaries of living an opportunity for urban regeneration for the eastern area of Udine The East Udinese quadrant can be assumed as a manifesto of Friuli: a crossroads of peoples and details of a minor history, but also characterized by precious architectural evidence that can be transformed into an experimental laboratory for new ways of living and sustainability. Not only. The East Udinese area is a border area: until 1900 border between city and countryside (rurality witnessed by the presence of farmhouses and farmhouses). From the early years of the same century until the end of the Cold War, it was the eastern border of the Iron Curtain: three large barracks were established (Osoppo, Cavarzerani and Spaccamela). Summary of the objectives of the Experimental City project - Improve and qualify urban decorum; - Increase territorial security and capacity for urban resilience; - Reinforce the settlement character of the former Osoppo and Cavarzerani barracks by constructing a "piece of city" that could be a centrality of services and public spaces throughout the eastern area of Udine; - Improve and (re) activate forms of mobility not only focused on private vehicles; - Develop a multiplicity of forms of housing, work and "being together" in the public dimension; - Reduce global emissions, energy consumption, consumption of natural resources, including land consumption; - Improve the quality of life of citizens, especially weak users; - Guaranteeing equal opportunities; - Manage sustainability in a rational and consistent manner.

b. Scenarios raking

i. Performance Scores

Issues	Current state	Scenario 1
TOTAL SCORE	**1,49**	**1,81**
A – Built Urban Systems	4,65	4,65
B – Economy	0,94	0,45
C – Energy	-0,14	-0,11
D – Atmospheric	0,30	1,07
E – Non-renewable sources	1,21	1,21
F - Environment	2,35	2,36
G – Social aspects	2,32	3,45

Passport

Issues	Current state	Scenario 1
TOTAL SCORE	**0,5**	**0,9**
A – Built Urban Systems	0,1	0,1
B – Economy	0,2	0,2
C – Energy	-0,1	-0,1
D – Atmospheric	-1,0	0,0
E – Non-renewable sources	-0,1	-0,1
F - Environment	2,4	2,4
G – Social aspects	2,7	3,5

ii. Key Performance Indicators

SCENARIO 1			
KPI	**Indicator**	**Unit of measure**	**Value**
A 1.7 Conservation of Land	Area of undeveloped land with ecological or agricultural value / area of the neighborhood	%	7,20
B.3.3 Use stage energy cost for public buildings	Aggregated annual operating energy cost per aggregated indoor useful floor area	Euro/m^2/year	9,70
C.1.1 Total final thermal energy consumption for building operations	Aggregated annual total final thermal energy consumption per aggregated indoor useful floor area	kWh/m^2/year	74,26
C.1.4 Total final electric energy consumption for building operations	Aggregated annual total final electric energy consumption per aggregated indoor useful floor area	kWh/m^2/year	17,43
C.1.7 Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area	kWh/m^2/year	181,06
C.2.1 Share of renewable energy on-site, on total final thermal energy consumptions for buildings operation	Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy consumption	%	3,01
C.2.7 Share of renewable energy on-site, on final electric energy consumptions.	Share of renewable electric energy in final electric energy consumptions	%	3,11
D.1.2 Total GHG Emissions from primary energy used in building operations	CO_2 equivalent emissions per useful internal floor area per year	kg CO_2/m2/yr	33,94
E.1.6 Consumption of potable water for residential population	Annual potable water consumption per occupant	m^3/occupant/year	48,68
E.1.7 Consumption of potable water for non-residential building systems	Annual water consumption per occupant	m^3/m^2	0,924
F.1.3 Recharge of groundwater through permeable paving or landscaping	Area of permeable surfaces on total neighborhood area	%	60.79
F.2.3 Ambient air quality with respect to particulates <10 µm (PM10) over a one year period	Number of days exceeding the daily limits in a year	day/year	22
G.2.1 Performance of the public transport	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop.	%	90,08
G.2.4 Quality of pedestrian and bicycle network	Total walkway meters of dedicated pedestrian paths and meters of bicycle path and “shared space” per 100 inhabitants.	m/100 inhabitants	84.89
G.4.2 Availability and proximity of key services	Percentage of inhabitants that are within 800 meters walking distance of at least 3 key services	%	97,33
G.6.3 Community involvement in urban planning activities	Level of involvement of users in urban planning	Level (score)	3

iii. Financing mechanisms evaluation

Scenario 1	Announcement for the preparation of the extraordinary program of public work for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978.

iv. Synergies at urban level

Scenario 1	Urban redevelopment developed on the basis of a common strategic project in order to coordinate multiple actions carried out by different public and private bodies.

6. RETROFIT CONCEPT

SELECTED SCENARIO	DESCRIPTION
1.	1) Redevelopment of a former area used as barracks with construction of new buildings and recovery of some structures; 2) New urban furniture through the creation of some sports spaces, new roads and some green spaces redevelopment; 3) Improvement of the services available for the population present in the area. 4) Energy requalification of two buildings.

KEY ELEMENTS OF THE CONCEPT

Retrofits Strategies	Redevelopment of two buildings
	Recovery of a disused military area through new urban furniture
	Realization of areas for urban gardens
Performance improvement	Reduction of greenhouse gas emissions.
	Provision of areas for cultivation of food for personal use.
	Reduction of energy costs.
Financial mechanism	Announcement for the preparation of the extraordinary program of public work for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978.

BUILDING SCALE ASSESSMENT – BUILDING 1

1. INITIATION

General information on the selected building	
PEEP EST I67	
Address	*Via Afro, 1 33100 UDINE (Italy)*
Building use	*Residential building*
Owner	*Municipality of Udine*
Year of construction	*1981-1984*
Building method	*Building in line with load-bearing wall in reinforced concrete and concrete-slab floors*
Number of levels above earth	*7*
Number of levels underground	*1*
Heating system	*Autonomous gas generator system*
Cooling system	*Absent*
DHW system	*Autonomous system with gas heat generator in the single real estate units*
Ventilation system	*Natural ventilation*
Lighting system	*Incandescent and energy-saving lamps*
Average U value	*1,250 W/m2°K*
Number of occupants	*155*
Hours of occupation per year	*8760*

2. PREPARATION

a. SBTool structure

In this section it is described the structure of your CESBA MED SBTool.
Please, enter here the list of the criteria selected from the CESBA MED SBT Generic Framework.

A - SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE	
A1	**Site Regeneration and Development**
A1.8	*Use of native plant types*
A1.10	*Provision and quality of children's play area(s)*
A1.12	*Provision and quality of bicycle pathways and parking*
A2	**Urban Design**
A2.1	*Maximizing efficiency of land use through development density*
A3	**Project Infrastructure and Services**
A3.12	*Provision of on-site communal transportation system(s)*

B - ENERGY AND RESOURCES CONSUMPTION	
B1	**Total Life Cycle Non-Renewable Energy**
B1.1	*Primary energy demand*
B1.2	*Delivered thermal energy demand*
B1.3	*Delivered electric energy demand*
B1.5	*Energy from renewable sources in total thermal energy consumption*
B1.6	*Energy from renewable sources in total electric energy consumption*
B1.11	*Embodied non-renewable primary energy*
B2	**Embodied Energy**
B3	**Use of Materials**
B3.1	*Degree of re-use of suitable existing structure(s) where available*
B3.5	*Recycled materials*
B3.7	*Easy of disassembly, re-use or recycling*
B4	**Use of potable water, stormwater and greywater**
B4.3	*Use of water for irrigation purposes*
B4.5	*Potable water consumption for indoor uses*

C - ENVIRONMENTAL LOADINGS	
C1	**Greenhouse Gas Emissions**
C1.3	*Global Warming potential*
C3	**Solid and Liquid Wastes**
C3.1	*Construction and demolition waste.*
C3.2	*Solid waste from building operation.*
C4	**Impacts on Project Site**
C4.1	*Recharge of groundwater through permeable paving or landscaping.*
C5	**Other Local and Regional Impacts**
C5.7	*Contribution to Heat Island Effect from roofing, landscaping and paved areas.*

D - INDOOR ENVIRONMENTAL QUALITY	
D1	**Indoor Air Quality and Ventilation**
D1.4	*TVOC concentration in indoor air*
D1.10	*Ventilation rate*
D2	**Air Temperature and Relative Humidity**
D2.2	*Thermal comfort index*
D3	**Daylighting and Illumination**
D3.1	*Appropriate daylighting in primary occupancies areas*
D4	**Noise and Acoustics**
D4.1	*Noise attenuation through the exterior envelope*

E - SERVICE QUALITY	
E5	**Optimization and Maintenance of Operating Performance**
E5.5	*On-going monitoring and verification of performance-*

F - SOCIAL, CULTURAL AND PERCEPTUAL ASPECTS	
F1	**Social AspectsSocial Aspects**
F1.1	*Universal access on site and within the building*
F2	**Culture and Heritage**
F2.4	*Use of traditional local materials and techniques*

G - COST AND ECONOMIC ASPECTS	
G1	**Cost and Economics**
G1.4	*Use stage energy cost*
G1.5	*Use stage water cost*

b. SBTool criteria selection rationale

In this section PPs must motivate the selection of the criteria that have been included in the regional CESBA MED SBTool. Why the criterion has been included? The reason could depend on regional policies or targets.

A – SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE	
CRITERION	**REASON/MOTIVATION**
A1.8 – *Use of native plant types*	*Reduce water consumption using native plants*
A1.10 – *Provision and quality of children's play area(s)*	*Evaluate the quality of children's playing areas*
A1.12 – *Provision and quality of bicycle pathways and parking*	*Incentive use of bicycle*
A2.1 – *Maximizing efficiency of land use through development density*	*Reduce land consumption*
A3.12 – *Provision of on-site communal transportation system(s)*	*Evaluate the public transport service*

B – ENERGY AND RESOURCES CONSUMPTION	
CRITERION	**REASON/MOTIVATION**
B1.1 – *Primary energy demand*	*Criterion is mandatory*
B1.2 – *Delivered thermal energy demand*	*Criterion is mandatory*
B1.3 – *Delivered electric energy demand*	*Criterion is mandatory*
B1.5 – *Energy from renewable sources in total thermal energy consumption*	*Criterion is mandatory*
B1.6 – *Energy from renewable sources in total electric energy consumption*	*Criterion is mandatory*
B1.11 – *Embodied non-renewable primary energy*	*Not applicable*
B3.1 – *Degree of re-use of suitable existing structure(s) where available*	*Encourage the reuse of existing volumes*
B3.5 – *Recycled materials*	*Not applicable*
B3.7 – *Easy of disassembly, re-use or recycling*	*Evaluate the degree of ease of reuse*
B4.3 – *Use of water for irrigation purposes*	*Evaluate the consumption of irrigation water*
B4.5 – *Potable water consumption for indoor uses*	*Criterion is mandatory*

C – ENVIRONMENTAL LOADINGS	
CRITERION	**REASON/MOTIVATION**
C1.3 – *Global Warming potential*	*Criterion is mandatory*
C3.1 – *Construction and demolition waste.*	*Not applicable*
C3.2 – *Solid waste from building operation.*	*Criterion is mandatory*
C3.3 - *Liquid effluents from building operations that are sent off the site.*	*To minimize the volume of waste water*
C4.1 - *Recharge of groundwater through permeable paving or landscaping.*	*To assess the extent to which natural groundwater in the site is recharged.*
C5.7 - *Contribution to Heat Island Effect from roofing, landscaping and paved areas.*	*Reduce the heat island effect*

D – INDOOR ENVIRONMENTAL QUALITY	
CRITERION	**REASON/MOTIVATION**
D1.4 – T*VOC concentration in indoor air*	*Criterion is mandatory*
D2.2 – *Thermal comfort index*	*Criterion is mandatory*
D3.1 - *Appropriate daylighting in primary occupancies areas*	*To ensure an adequate level of daylighting in all primary occupied spaces.*
D4.1 - *Noise attenuation through the exterior envelope*	*Evaluate the quality with respect to noise sources*

E – SERVICE QUALITY	
CRITERION	**REASON/MOTIVATION**
E3.1 - *Effectiveness of facility management control system*	*Evaluate the level of building control*
E5.5 - *On-going monitoring and verification of performance*	*Incentive monitoring of buildings*

F – SOCIAL, CULTURAL AND PERCEPTUAL ASPECTS	
CRITERION	**REASON/MOTIVATION**
F1.1 - *Universal access on site and within the building*	*To assess the relative ease of access and use of facilities for persons with mobility or perceptual disabilities.*
F2.4 - *Use of traditional local materials and techniques*	*To assess the extent to which traditional local materials and construction techniques will used in the execution of the project.*

G – COST AND ECONOMIC ASPECTS	
CRITERION	**REASON/MOTIVATION**
G1.4 – *Use stage energy cost*	*Criterion is mandatory*
G1.5 – *Use stage water cost*	*Criterion is mandatory*

c. SBTool weights rationale

In this section PPs must motivate the value of weights assigned to the different issues, categories and criteria. Why the weight of a particular issue or criterion is higher (or lower)? Weights should reflect the regional political priorities.

ISSUE	WEIGHT (1 to 3)	MOTIVATION
A – SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE	**1**	Rigidity of the system
B – ENERGY AND RESOURCES CONSUMPTION	**3**	Political priority; PAC - PAES - EMAS
C – ENVIRONMENTAL LOADINGS	**3**	Political priority; PAC - PAES - EMAS
D – INDOOR ENVIRONMENTAL QUALITY	**2**	Reduced power of intervention - Reduced intervention domain
E – SERVICE QUALITY	**3**	Political priority; PAC - PAES - EMAS
F – SOCIAL CULTURAL AND PERCEPTUAL ASPECTS	**2**	Reduced power of intervention - Reduced intervention domain
G – COST AND ECONOMIC ASPECTS	**2**	Reduced power of intervention - Reduced intervention domain

CATEGORIES	WEIGHT (%)
B1 – In use energy consumptions	87
B3 – Use of materials	0
B4 – Use of water, stormwater and greywater	13
TOTAL	100
C1 – Greenhouse gas emissions	56
C3 – Solid and liquid waste	44
TOTAL	100
D1 – Indoor air quality and ventilation	0
D2 – Thermal comfort	100
TOTAL	100
G1 – Cost and economics	100
TOTAL	100

CRITERIA WEIGHTS

SBTool file A – WeightA-G

B - ENERGY AND RESOURCES CONSUMPTION						
B1 – In use energy consumptions						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
B1.1	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.2	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.3	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.5	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.6	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.11	*11,3*	*5*	*5*	*2*	*0*	*Not applicable*
B3 – Use of materials						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
B3.5	*5,4*	*4*	*3*	*3*	*0*	*Not applicable*
B4 – Use of water, stormwater and greywater						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
B4.5	*8,1*	*4*	*3*	*3*		*Criterion is mandatory*

C - ENVIRONMENTAL LOADINGS						
C1 - Greenhouse gas emissions						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
C1.3	*13,5*	*5*	*4*	*3*		*Criterion is mandatory*
C3 - Solid and liquid waste						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
C3.1	*5,4*	*4*	*3*	*2*	*0*	*Not applicable*
C3.2	*5,4*	*4*	*3*	*2*		*Criterion is mandatory*

D - INDOOR ENVIRONMENTAL QUALITY						
D1 - Indoor air quality and ventilation						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
D1.4	*1,4*	*1*	*3*	*3*	*0*	*Not applicable*
D1.10	*1,4*	*1*	*3*	*3*	*0*	*Not applicable*
D2 – Thermal comfort						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
D2.2	*1,4*	*1*	*3*	*3*		*Criterion is mandatory*

G - COST AND ECONOMIC ASPECTS						
G1 - Cost and economics						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
G1.4	*0.9*	*2*	*3*	*1*		*Criterion is mandatory*
G1.5	*0.9*	*2*	*3*	*1*		*Criterion is mandatory*
TOTAL	**100**					

d. SBTool benchmarks rationale

In this section PPs must motivate 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. Please keep in mind that score 3 represents a best practice performance. Score 5 is an excellent performance.

A - SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
A1.8	*The extent of vegetated landscaped area that is planted with native plants.*	*%*	*0: 45*	*UNI PdR 13 ITACA*
			5: 70	*UNI PdR 13 ITACA*
A1.10	*The existence and type of facilities for children's play and the quality of service provided*	*-*	*0: 0*	*UNI PdR 13 ITACA*
			5: 5	*UNI PdR 13 ITACA*
A1.12	*Amount of sheltered and unsheltered bicycle parking, location of bicycle parking facilities relative to building entrances*	*-*	*0: 0*	*UNI PdR 13 ITACA*
			5: 5	*UNI PdR 13 ITACA*
A2.1	*Development density of the project, expressed as the ratio of gross floor area above grade of the Design relative to the maximum permitted gross floor area on the site.*	*%*	*0: 35*	*Current level*
			5: 100	*Maximum exploitation*
A3.12	*Existence and type of an on-site public or communal transportation system*	*-*	*0: 0*	*-*
			5: 5	*-*

B - ENERGY AND RESOURCES CONSUMPTION				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
B1.1	*Primary energy demand*	*kWh/m2/y*	*0: 140*	*-*
			5: 23	*Energy regulation*
B1.2	*Delivered thermal energy demand*	*kWh/m2/y*	*0: 80*	*-*
			5: 10	*Energy regulation*
B1.3	*Delivered electric energy demand*	*kWh/m2/y*	*0: 23*	*-*
			5: 5	*-*
B1.5	*Energy from renewable sources in total thermal energy consumption*	*%*	*0: 25*	*-*
			5: 50	*D.Leg. 28/11*
B1.6	*Energy from renewable sources in total electric energy consumption*	*%*	*0: 35*	*-*
			5: 75	*-*

B1.11	*Embodied non-renewable primary energy*	*kWh/m²/yr*	*0: -*	*Non applicable*
			5: -	*Non applicable*
B3.1	*Degree of re-use of suitable existing structure(s) where available*	*%*	*0: 0*	*UNI PdR 13 ITACA*
			5: 100	*UNI PdR 13 ITACA*
B3.5	*Recycled materials*	*%*	*0: 15*	*UNI PdR 13 ITACA*
			5: 50	*UNI PdR 13 ITACA*
B3.7	*Easy of disassembly, re-use or recycling*	*-*	*0: 0*	*Scenario*
			5: 5	*Scenario*
B4.3	*Use of water for irrigation purposes*	*m³/m² year*	*0: 0,20*	*UNI PdR 13 ITACA*
			5: 0,05	*-*
B4.5	*Water consumption for indoor uses*	*m³/occupant/year*	*0: 47*	*UNI PdR 13 ITACA*
			5: 23	*-*

C - ENVIRONMENTAL LOADINGS

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
C1.3	*Global Warming potential*	*kg CO2 eq./m²/yr*	*0: 28*	*-*
			5: 5	*Energy regulation*
C3.1	*Construction and demolition waste.*	*kg/m²/life cycle stage*	*0: -*	*Non applicable*
			5: -	*Non applicable*
C3.2	*Solid waste from building operation.*	*%*	*0: 14*	*At least one*
			5: 100	*All the services*
C3.3	*Liquid effluents from building operations that are sent off the site.*	*m3 / pp*yr*	*0: 0,13*	*UNI PdR 13 ITACA*
			5: 0	*UNI PdR 13 ITACA*
C4.1	*Recharge of groundwater through permeable paving or landscaping.*	*%*	*0: 40*	*UNI PdR 13 ITACA*
			5: 60	*UNI PdR 13 ITACA*
C5.7	*Contribution to Heat Island Effect from roofing, landscaping and paved areas.*	*%*	*0: 0*	*UNI PdR 13 ITACA*
			5: 100	*UNI PdR 13 ITACA*

D - INDOOR ENVIRONMENTAL QUALITY

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
D1.4	*TVOC concentration in indoor air*	*µg per cube meter*	*0: 2000*	*UNI PdR 13 ITACA*
			5: 1000	*<1500 limit CAM = 3*

D1.10	*Ventilation rate*	l/s/m^2	*0: 0,35*	*UNI EN 15251 Table B.5 Cat III*
			5: 0,49	*UNI EN 15251 Table B.5 Cat I*
D2.2	*Thermal comfort index*	-	*0: 10*	*UNI EN ISO 7730 Class B*
			5: 6	*UNI EN ISO 7730 Class A*
D3.1	*Appropriate daylighting in primary occupancies areas*	*%*	*0: 100*	*Reference law*
			5: 125	*UNI PdR 13 ITACA*
D4.1	*Noise attenuation through the exterior envelope*	*STC-Rw*	*0: 37*	*Standard window*
			5: 45	*Best window*

E - SERVICE QUALITY

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
E3.1	*Effectiveness of facility management control system*	-	*0: 0*	*Scenario*
			5: 5	*Scenario*
E5.5	*On-going monitoring and verification of performance*	-	*0: 0*	*Scenario*
			5: 5	*Scenario*

F - SOCIAL CULTURAL AND PERCEPTUAL ASPECTS

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
F1.1	*Universal access on site and within the building*	-	*0: 0*	*Scenario*
			5: 5	*Scenario*
F2.4	*Use of traditional local materials and techniques*	*%*	*0: 30*	*UNI PdR 13 ITACA*
			5: 80	*UNI PdR 13 ITACA*

G - COST AND ECONOMIC ASPECTS

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
G1.4	*Use stage energy cost*	€/m2/yr	*0: 10,70*	-
			5: 1,75	*Energy regulation*
G1.5	*Use stage water cost*	*€/m2/yr*	*0: 1,55*	-
			5: 0,70	*Energy regulation*

e. SBTool Criteria Specifications

In this section PPs must indicate for each selected criterion:

- *Information source: The source of the data/information that will be used to characterize the value of the indicator. Example: monitored data, measured data, statistic data, models and simulation, studies, data banks, etc.*
- *Assessment method: Short and concise description of the assessment method used to verify the value of indicators. Example: calculation steps, data analysis process, monitoring procedure, content of a study, use of statistic data, etc.*
- *Standards: technical documents taken as reference for the assessment method.*

A - SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
A1.8	*The extent of vegetated landscaped area that is planted with native plants*	*Information source*	*Assessment by landscape architect*
		Assessment method	*The percent of landscaped area (excuding paved areas) planted with native species*
		Standard	*UNI PdR 13 ITACA*
A1.10	*The existence and type of facilities for children's play and the quality of service provided*	*Information source*	*Assessment by landscape architect*
		Assessment method	*Evaluation scenario*
		Standard	*UNI PdR 13 ITACA*
A1.12	*Amount of sheltered and unsheltered bicycle parking, location of bicycle parking facilities relative to building entrances*	*Information source*	*Rilievo*
		Assessment method	*Evaluation scenario*
		Standard	*UNI PdR 13 ITACA*
A2.1	*Development density of the project, expressed as the ratio of gross floor area above grade of the Design relative to the maximum permitted gross floor area on the site.*	*Information source*	*PRGC*
		Assessment method	*The ratio of gross floor area above grade of the Design relative to the maximum permitted gross floor area on the site*
		Standard	*Current situation*

A3.12	*Existence and type of an on-site public or communal transportation system.*	*Information source*	*Hours of public service*
		Assessment method	*Evaluation scenario*
		Standard	*Scenario*

B - ENERGY AND RESOURCES CONSUMPTION			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
B1.1	*Primary energy demand per internal useful floor area per year*	*Information source*	*Consumption bills*
		Assessment method	*Calculated using the measured values*
		Standard	*Energy regulation*
B1.2	*Delivered thermal energy demand per internal useful floor area per year*	*Information source*	*Energy bills*
		Assessment method	*Calculated using the measured values*
		Standard	*Energy regulation*
B1.3	*Delivered electric energy demand per internal useful floor area per year*	*Information source*	*Energy bills*
		Assessment method	*Calculated using the measured values*
		Standard	*Reference of the law*
B1.5	*Share of renewable energy in final thermal energy consumptions*	*Information source*	*Monitoring of produced energy*
		Assessment method	*Calculated using the measured values*
		Standard	*Reference of the law*
B1.6	*Share of renewable energy in final electric energy consumption*	*Information source*	*Monitoring of produced energy*
		Assessment method	*Calculated using the measured values*
		Standard	*-*
B1.11	*Embodied non-renewable primary energy*	*Information source*	*Non applicable*
		Assessment method	*-*
		Standard	*-*

B3.1	*Degree of re-use of suitable existing structure(s) where available*	*Information source*	*Executive projects*
		Assessment method	*The percentage (by area) of existing sound structures that is planned to be re-used as part of the project*
		Standard	*UNI PdR 13 ITACA*
B3.5	*Wight of recycled materials on total weight of materials.*	*Information source*	*Non applicable*
		Assessment method	*-*
		Standard	*UNI PdR 13 ITACA*
B3.7	*Easy of disassembly, re-use or recycling*	*Information source*	*Executive projects*
		Assessment method	*Scenario*
		Standard	*Scenario*
B4.3	*Use of water for irrigation purposes*	*Information source*	*Consumption bills*
		Assessment method	*Volume of water on gross surface*
		Standard	*UNI PdR 13 ITACA*
B4.5	*Potable water consumption per occupant per year*	*Information source*	*Consumption bills*
		Assessment method	*Calculated using the measured values*
		Standard	*UNI PdR 13 ITACA*

C – ENVIRONMENTAL LOADINGS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
C1.3	*CO2 equivalent emissions per internal useful floor area per year*	*Information source*	*Energy bills*
		Assessment method	*Calculated using the estimate based on the measures*
		Standard	*Energy regulation*
C3.1	*Weight of waste and materials generated per 1 m2 of useful floor area demolished or constructed*	*Information source*	*Non applicable*
		Assessment method	*-*
		Standard	*UNI PdR 13 ITACA*

C3.2	*Ratio of the number of collectable solid waste categories within a 100 m distance from the building's entrance to the reference solid waste categories*	*Information source*	*Relief and georeferencing containers*
		Assessment method	*Calculated using the measured values*
		Standard	-
C3.3	*Liquid effluents from building operations that are sent off the site.*	*Information source*	*Bills*
		Assessment method	*The predicted volume of liquid waste per year to be sent off the site for treatment*
		Standard	*UNI PdR 13 ITACA*
C4.1	*Recharge of groundwater through permeable paving or landscaping.*	*Information source*	*Design documents and on-site surveys*
		Assessment method	*The predicted percentage of precipitation that is able to recharge groundwater through permeable paving or landscaping.*
		Standard	*UNI PdR 13 ITACA adapted*
C5.7	*Contribution to Heat Island Effect from roofing, landscaping and paved areas.*	*Information source*	*Design documents and on-site surveys*
		Assessment method	*Percentage of surface with a high reflection index*
		Standard	*UNI PdR 13 ITACA*

D – INDOOR ENVIRONMENTAL QUALITY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
D1.4	*TVOC concentration in indoor air*	*Information source*	*Not applicable*
		Assessment method	-
		Standard	*UNI PdR 13 ITACA*
D1.10	*Ventilation rate normalized per useful floor area*	*Information source*	*Not applicable*
		Assessment method	
		Standard	*UNI EN 15251*

D2.2	*Predicted Percentage Dissatisfied (PPD)*	*Information source*	-
		Assessment method	-
		Standard	*UNI EN ISO 7730 Class B*
D3.1	Daylighting and Illumination	*Information source*	Design documents
		Assessment method	*Rapporto fra DF e DF lim*
		Standard	*UNI PdR 13 ITACA*
D4.1	Noise attenuation through the exterior envelope	*Information source*	Design documents
		Assessment method	*Ratio between DF and DF lim*
		Standard	*Standard window*

E – SERVICE QUALITY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
E3.1	*Effectiveness of facility management control system*	*Information source*	*Design documents*
		Assessment method	*Scenario*
		Standard	*Scenario*
E5.5	*On-going monitoring and verification of performance*	*Information source*	*Contract documentation.*
		Assessment method	*Scenario*
		Standard	*Scenario*

F – SOCIAL CULTURAL AND PERCEPTUAL ASPECTS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
F1.1	*Universal access on site and within the building*	*Information source*	*Design documents*
		Assessment method	*Scenario*
		Standard	*Scenario*
F2.4	*Use of traditional local materials and techniques*	*Information source*	*Design documents*
		Assessment method	*The estimated percentage of traditional local materials*
		Standard	*UNI PdR 13 ITACA*

G – COST AND ECONOMIC ASPECTS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
G1.4	*Energy annual cost per usable floor area*	*Information source*	*Consumption bills*
		Assessment method	*Energy annual cost per usable floor area*
		Standard	*Energy regulation*
G1.5	*Water annual cost per usable floor area*	*Information source*	*Consumption bills*
		Assessment method	*Water annual cost per usable floor area*
		Standard	*Energy regulation*

3. DIAGNOSIS

a. Performance scores

Evaluation of the actual performance and relative level of sustainability of the Building.
PPs have to indicate the scores reached.

	SCORE
B – ENERGY AND RESOURCES CONSUMPTION	
B1 – In use energy consumptions	
B1.1 – Primary energy demand	-1,0
B1.2 – Delivered thermal energy demand	-1,0
B1.3 – Delivered electric energy demand	1,0
B1.5 – Energy from renewable sources in total thermal energy consumption	-1,0
B1.6 – Energy from renewable sources in total electric energy consumption	-1,0
B1.11 – Embodied non-renewable primary energy	N.A.
B3 – Use of materials	
B3.5 – Recycled materials	N.A.
B4 – Use of water, stormwater and greywater	
B4.5 – Potable water consumption for indoor uses	-1,0
C- ENVIRONMENTAL LOADINGS	
C1 – Greenhouse gas emissions	
C1.3 – Global Warming potential	-1,0
C3 – Solid and liquid waste	
C3.1 – Construction and demolition waste.	N.A.
C3.2 – Solid waste from building operation.	-1,0
D- INDOOR ENVIRONMENTAL QU	
D1 – Indoor air quality and ventilation	
D1.4 – TVOC concentration in indoor air	N.A.
D1.10 – Ventilation rate	N.A.
D2 – Thermal comfort	
D2.2 – Thermal comfort index	-1,0
G- COST AND ECONOMIC ASPECTS	
G1 – Cost and economics	
G1.4 – Use stage energy cost	-1,0
G1.5 – Use stage water cost	-1,0

b. Key Performance Indicators value

KPI	Indicator	Unit of measure	Value
B1.1 – Primary energy demand	Primary energy demand per internal useful floor area per year	kWh/m2/yr	160,66
B1.2 – Delivered thermal energy demand	Delivered thermal energy demand per internal useful floor area per year	kWh/m2/yr	108,48
B1.3 – Delivered electric energy demand	Delivered electric energy demand per internal useful floor area per year	kWh/m2/yr	19,26
B1.5 – Energy from renewable sources in total thermal energy consumption	Share of renewable energy in final thermal energy consumptions	%	0,00
B1.6 – Energy from renewable sources in total electric energy consumption	Share of renewable energy in final electric energy consumption	%	0,00
B1.11 – Embodied non-renewable primary energy	Embodied primary non-renewable energy	MJ/m2	Non Applicable
B3.5 – Recycled materials	Weight of recycled materials on total weight of materials.	%	Non Applicable
B4.5 – Potable water consumption for indoor uses	Potable water consumption per occupant per year	m^3/occupant/year	52,232
C1.3 – Global Warming potential	CO_2 equivalent emissions per internal floor area per year	kg CO_2 eq./m2/yr	31,65
C3.1 – Construction and demolition waste	Weight of waste and materials generated per 1 m^2 of useful floor area demolished or constructed	kg/m^2/life cycle stage	Non Applicable
C3.2 – Solid waste from building operation	Ratio of the number of collectable solid waste categories within a 100 m distance from the building's entrance to the reference solid waste categories	%	0,00
D1.4 – TVOC concentration in indoor air	TVOC concentration in indoor air	µg / m^3	Non Applicable
D1.10 – Ventilation rate	Ventilation rate normalized per useful floor area	l/s/m^2	Non Applicable
D2.2 – Thermal comfort index	Predicted Percentage Dissatisfied (PPD)	%	Not detected
G.1.4 Use stage energy cost	Energy annual cost per usable floor area	€/m2/yr	12,07
G.1.5 Use stage water cost	Water annual cost per usable floor area	€/m2/yr	2,17

c. Actual performance analysis

WEAKNESSES ASPECTS	*Some interventions already carried out, thermal insulation on the blind facades and on the attic of the first floor.*
STRENGHT ASPECTS	*The building is managed by ATER and the interventions must be part of the institute's investment plan. The building is the building is entirely inhabited and the interventions of isolation from the inside (towards unheated rooms - stairwell) are not easily carried out.* *The transformation from autonomous systems to centralized systems is not possible due to the lack of adequate space for technological systems.*
POTENTIAL FOR PERFORMANCE IMPROVEMENT	*The scenario identifies as an intervention the laying of a coat and the replacement of external windows; we could evaluate the energy redevelopment of the roof and the replacement of the floor insulation on the first floor to increase its performance.* *The presence of the flat roof could allow the installation of a photovoltaic system that could however only cover shared electrical services.*

4. STRATEGIC DEFINITION

a. Performance targets

Each partner must establish a target value for each criterion in the SBTool.

The target values have to reflect the global Environmental, Social and Economic targets established at urban level.

A – SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE			
A1 – Site Regeneration and Development			
A1.8 – Use of native plant types		Actual value	100
A The extent of vegetated landscaped area that is planted with native plants	%	Target value	60
A1.10 – Use of native plant types		Actual value	-1
The existence and type of facilities for children's play and the quality of service provided	-	Target value	3
A1.12 – Provision and quality of bicycle pathways and parking		Actual value	-1
Amount of sheltered and unsheltered bicycle parking, location of bicycle parking facilities relative to building entrances	-	Target value	3
A2 – Urban Design			
A2.1 – Maximizing efficiency of land use through development density		Actual value	38,31
Development density of the project, expressed as the ratio of gross floor area above grade of the Design relative to the maximum permitted gross floor area on the site.	%	Target value	100
A3 – Project Infrastructure and Services			
A3.12 – Maximizing efficiency of land use through development density		Actual value	0
Existence and type of an on-site public or communal transportation system	-	Target value	3

B – ENERGY AND RESOURCES CONSUMPTION			
B1 – In use energy consumptions			
B1.1 – Primary energy demand (in use stage)		Actual value	160,66
Primary energy demand per internal useful floor area per year	kWh/m^2/yr	Target value	96
B1.2 - Delivered thermal energy demand (in use stage)		Actual value	108,48
Delivered thermal energy demand per internal useful floor area per year	kWh/m2/yr	Target value	65
B1.3 - Delivered electric energy demand (in use stage)		Actual value	19,26
Delivered electric energy demand per internal useful floor area per year	kWh/m2/yr	Target value	11.56
B1.5 - Energy from renewable sources in total final thermal energy consumption		Actual value	0,00
Share of renewable energy in final thermal energy consumptions	%	Target value	40

B1.6 - Energy from renewable sources in total electric energy consumption		Actual value	0,00
Share of renewable energy in final electric energy consumption	%	Target value	59
B1.11 - Embodied non-renewable primary energy		Actual value	Non Applicable
Embodied primary non-renewable energy	%	Target value	
B2 - Embodied energy			
B3 - Use of materials			
B3.1 - Degree of re-use of suitable existing structure(s) where available		Actual value	100
The percentage (by area) of existing sound structures that is planned to be re-used as part of the project :	%	Target value	50
B3.5 - Recycled materials		Actual value	Non Applicable
Weight of recycled materials on total weight of materials.	%	Target value	36
B3.7 - Easy of disassembly, re-use or recycling		Actual value	-1
Review of contract documentation by an outside deconstruction specialis	-	Target value	3
B4 - Use of water, stormwater and greywater			
B4.3 - Use of water for irrigation purposes		Actual value	0,19
The predicted gross annual potable water volume to be used for irrigation purposes in m3 / m2 per year of landscaped area (before accounting for re-use of greywater and rainwater).	m^3/m^2/year	Target value	0,11
B4.5 - Water consumption for indoor uses		Actual value	52,232
Water consumption per occupant per year	m^3/occupant/year	Target value	32

C - ENVIRONMENTAL LOADINGS			
C1 - Greenhouse gas emissions			
C1.3 - Global Warming potential		Actual value	31,65
CO2 equivalent emissions per useful internal floor area per year	kg CO2 eq./m2/yr	Target value	25
C3 - Solid and liquid waste			
C3.1 - Construction and demolition waste.		Actual value	Non Applicable
Weight of waste and materials generated per 1 m2 of useful floor area demolished or constructed	kg/m^2/life cycle stage	Target value	-
C3.2 - Solid waste from building operation.		Actual value	0,00
Ratio of the number of collectable solid waste categories within a 100 m distance from the building's entrance to the reference solid waste categories	%	Target value	71%
C3.3 - Liquid effluents from building operations that are sent off the site		Actual value	0,14
Ratio between the number of collectable solid waste types in a 50 meters distance from the building's entrance and the reference solid waste categories.	m^3 / pp*yr	Target value	5
C4 - Impacts on Project Site			
C4.1 - Recharge of groundwater through permeable paving or landscaping.		Actual value	47,74
The predicted percentage of precipitation that is able to recharge groundwater through permeable paving or landscaping	%	Target value	50

C5 - Other Local and Regional Impacts			
C5.7 - Contribution to Heat Island Effect from roofing, landscaping and paved areas.		Actual value	59,24
Rapporto tra la superficie parametrizzata con i coefficienti di riflessioni e la superficie totale	%	Target value	60

D - INDOOR ENVIRONMENTAL QUALITY			
D1 - Indoor air quality and ventilation			
D1.4 - TVOC concentration in indoor air		Actual value	Non Applicable
TVOC concentration in indoor air	$\mu g/m^3$	Target value	1500
D1.10 – Ventilation rate		Actual value	Non Applicable
Ventilation rate normalized per useful floor area	$l/s/m^2$	Target value	0,42 cat II
D2 - Air Temperature and Relative Humidity			
D2.2 - Thermal comfort index		Actual value	Not detected
Predicted Percentage Dissatisfied (PPD)	%	Target value	7
D3 - Daylighting and Illumination			
D3.1 - Appropriate daylighting in primary occupancies areas		Actual value	Not detected
The predicted Daylight Factor in a typical occupancy area located on the ground floor of the building, as indicated by drawings and specifications	%	Target value	115
D4 - Noise and Acoustics			
D4.1 - Noise attenuation through the exterior envelope		Actual value	<37
The predicted noise attenuation performance of the exterior wall most exposed to potential sources of noise, as indicated by design characteristics.	STC	Target value	42

E - SERVICE QUALITY			
E3 - Controllability			
E3.1 – Effectiveness of facility management control system		Actual value	0 -1
The presence of a computerized building management control system whose capability is consistent with the complexity of building systems.	-	Target value	3
E5 - Optimization and Maintenance of Operating Performance			
E5.5 – On-going monitoring and verification of performance		Actual value	-1
The provision of energy sub-metering systems and water consumption monitoring systems, according to design documentation.	-	Target value	3

F - SOCIAL CULTURAL AND PERCEPTUAL ASPECTS			
F1 - Social Aspects			
F1.1 - Universal access on site and within the building		Actual value	-1
The scope and quality of design measures planned to facilitate access and use of building facilities by persons with disabilities.	-	Target value	3

F2 - Culture and Heritage			
F2.4 - Use of traditional local materials and techniques		Actual value	40
Percent of the non-structural elements of the building will be constructed using traditional local materials and construction techniques.	%	Target value	60

G - COST AND ECONOMIC ASPECTS G1 - Cost and economics			
G1.4 - Use stage energy cost		Actual value	12,07
Energy annual cost per usable floor area	€/m^2/yr	Target value	5
G1.5 - Use stage water cost		Actual value	2,17
Water annual cost per usable floor area	€/m^2/yr	Target value	1,00

b. Constraints and restrictions

CONSTRAINTS / RESTRICTIONS	
Legal constraints	*P.R.G.C. current and Building Regulations. Communication of the 19/08/2016 of the Archaeological, fine Arts and Landscape Supervision Office of Friuli Venezia Giulia. Memorandum of understanding with Udine Prefecture*
Technical constraints	*-*
Financial constraints	*Announcement for the preparation of the extraordinary program of intervention for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978. "Experimental City" provides 18 public works to be realized autonomously for a total of € 17,550,000 and an action for € 750,000 proposed together with AcegaApsAmga, through an operating agreement, aimed to increase the safety (public lighting with very low consumption and remote control, vehicle license plate control, video surveillance, safety of pedestrian crossings with new systems, etc.). The total cost of the project is estimated at € 29.86 million.*
Environmental condition constraints	*-*
Stakeholder based restrictions	*Company Ferrovie Udine Cividale s.r.l. - project for the construction of the "San Gottardo" intermodal passenger center; FIAB Udine / Abicitudine Association - project for bicycle repair; Macross Association - project for new cohousing strategies; design, constitution and management of cultural artistic activities; AcegasApsAmga S.p.A. - project for the realization of "Smart City" technological systems and integration with public facilities lighting; Rugby Udine Union FVG s.r.l. - participation in the Educational Sports Table;*

	ATER Udine - project for urban redevelopment and enhancement of the territorial security of the "Aurora" district for a "new way of living"in public housing; *UISP Udine - management project for the practice of competitive sports, amateur, school, cultural and recreational activities;* *FININT SGR S.p.A. - project for the construction of 80 apartments in the former Osoppo Barracks*
Other relevant constraints	-

c. Potential strategies at urban scale

Synergy zones	
Energetic synergies	-
Water synergies	-
Waste synergies	-
Mobility synergies	-
Other synergies	-

5. DECISION MAKING

a. Description of scenarios

NAME OF SCENARIO	DESCRIPTION
1. ExperimentalCIty	Experimental city beyond the boundaries of living an opportunity for urban regeneration for the eastern area of Udine The East Udinese quadrant can be assumed as a manifesto of Friuli: a crossroads of peoples and details of a minor history, but also characterized by precious architectural evidence that can be transformed into an experimental laboratory for new ways of living and sustainability. Not only. The East Udinese area is a border area: until 1900 border between city and countryside (rurality witnessed by the presence of farmhouses and farmhouses). From the early years of the same century until the end of the Cold War, it was the eastern border of the Iron Curtain: three large barracks were established (Osoppo, Cavarzerani and Spaccamela). Summary of the objectives of the Experimental City project - Improve and qualify urban decorum; - Increase territorial security and capacity for urban resilience; - Reinforce the settlement character of the former Osoppo and Cavarzerani barracks by constructing a "piece of city" that could be a centrality of services and public spaces throughout the eastern area of Udine; - Improve and (re) activate forms of mobility not only focused on private vehicles; - Develop a multiplicity of forms of housing, work and "being together" in the public dimension; - Reduce global emissions, energy consumption, consumption of natural resources, including land consumption; - Improve the quality of life of citizens, especially weak users; - Guaranteeing equal opportunities; - Manage sustainability in a rational and consistent manner.

b. Scenarios raking

i. Performance Scores

Issues	Current state	Scenario 1
TOTAL SCORE	**-0,8**	**0,4**
B – Energy and Resources C.	-0,6	0,4
C – Environmental Loadings	-1,0	0,6
D – Indoor Env. Quality	-1,0	-1,0
G – Cost and Economic Asp.	-1,0	0,2

ii. Key Performance Indicators

SCENARIO 1			
KPI	**Indicator**	**Unit of measure**	**Value**
B1.1 - Primary energy demand	Primary energy demand per internal useful floor area per year	kWh/m^2/yr	97,13
B1.2 - Delivered thermal energy demand	Delivered thermal energy demand per internal useful floor area per year	kWh/m^2/yr	48,07
B1.3 - Delivered electric energy demand	Delivered electric energy demand per internal useful floor area per year	kWh/m^2/yr	19,26
B1.5 - Energy from renewable sources in total final thermal energy consumption	Share of renewable energy in final thermal energy consumptions	%	0
B1.6 - Energy from renewable sources in total electric energy consumption	Share of renewable energy in final electric energy consumption	%	0
B1.11 - Embodied non-renewable primary energy	Embodied primary non-renewable energy per area	MJ/m^2	N.A.
B3.5 - Recycled materials	Weight of recycled materials on total weight of materials.	%	N.A.
B4.5 – Potable water consumption for indoor uses	Water consumption per occupant per year	m$^{3/}$occupant/year	52,23
C1.3 - Global Warming potential	CO_2 equivalent emissions per useful internal floor area per year	kg CO_2 eq./m^2/yr	18,96
C3.1 - Construction and demolition waste	Weight of waste and materials generated per 1 m^2 of useful floor area demolished or constructed	kg/m^2/life cycle stage	N.A.

C3.2 - Solid waste from building operation	Ratio of the number of collectable solid waste categories within a 100 m distance from the building's entrance to the reference solid waste categories	%	0
D1.4 - TVOC concentration in indoor air	TVOC concentration in indoor air	µg/m^3	N.A.
D1.10 – Ventilation rate	Ventilation rate normalized per useful floor area	l/s/m^2	N.A.
D2.2 - Thermal comfort index	Predicted Percentage Dissatisfied (PPD)	%	Not detected
G1.4 - Use stage energy cost	Energy annual cost per usable floor area	€/m^2/yr	8,2
G1.5 - Use stage water cost	Water annual cost per usable floor area	€/m^2/yr	2,17

iii. Financing mechanisms evaluation

Scenario 1	Announcement for the preparation of the extraordinary program of public work for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978.

iv. Synergies at urban level

Scenario 1	Urban redevelopment developed on the basis of a common strategic project in order to coordinate multiple actions carried out by different public and private bodies.

6. RETROFIT CONCEPT

SELECTED SCENARIO	DESCRIPTION
1.	Energy requalification of two buildings.

KEY ELEMENTS OF THE CONCEPT

Retrofits Strategies	Redevelopment of two buildings
Performance improvement	Reduction of greenhouse gas emissions.
	Reduction of energy costs.
Financial mechanism	Announcement for the preparation of the extraordinary program of public work for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978.

BUILDING SCALE ASSESSMENT – BUILDING 2

1. INITIATION

General information on the selected building	
Secondary school I° E. Bellavitis (0301290050)	
Address	*Via XXV Aprile 3 – 33100 UDINE (UD)*
Building use	*E. Bellavititis secondary school*
Owner	*Municipality of Udine*
Year of construction	*1980*
Building method	*Iron bearing structure and walls made by prefabricated concrete elements*
Number of levels above earth	*2*
Number of levels underground	*1 (thermal power plant)*
Heating system	*Autonomous plant powered by gas, air conditioning system in the hall and in the gym*
Cooling system	*Absent*
DHW system	*Autonomous plant powered by gas and integration with solar thermal system*
Ventilation system	*Only in the Great Hall and in the gym*
Lighting system	*LED lamps*
Average U value	*0,804*
Number of occupants	*108*
Hours of occupation per year	*1680*

2. PREPARATION

a. SBTool structure

In this section it is described the structure of your CESBA MED SBTool.
Please, enter here the list of the criteria selected from the CESBA MED SBT Generic Framework.

A - SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE	
A1	**Site Regeneration and Development**
A1.8	*Use of native plant types*
A1.10	*Provision and quality of children's play area(s)*
A1.12	*Provision and quality of bicycle pathways and parking*
A2	**Urban Design**
A2.1	*Maximizing efficiency of land use through development density*
A3	**Project Infrastructure and Services**
A3.12	*Provision of on-site communal transportation system(s)*

B - ENERGY AND RESOURCES CONSUMPTION	
B1	**Total Life Cycle Non-Renewable Energy**
B1.1	*Primary energy demand*
B1.2	*Delivered thermal energy demand*
B1.3	*Delivered electric energy demand*
B1.5	*Energy from renewable sources in total thermal energy consumption*
B1.6	*Energy from renewable sources in total electric energy consumption*
B1.11	*Embodied non-renewable primary energy*
B2	**Embodied Energy**
B3	**Use of Materials**
B3.1	*Degree of re-use of suitable existing structure(s) where available*
B3.5	*Recycled materials*
B3.7	*Easy of disassembly, re-use or recycling*
B4	**Use of potable water, stormwater and greywater**
B4.3	*Use of water for irrigation purposes*
B4.5	*Potable water consumption for indoor uses*

C - ENVIRONMENTAL LOADINGS	
C1	**Greenhouse Gas Emissions**
C1.3	*Global Warming potential*
C3	**Solid and Liquid Wastes**
C3.1	*Construction and demolition waste.*
C3.2	*Solid waste from building operation.*
C4	**Impacts on Project Site**
C4.1	*Recharge of groundwater through permeable paving or landscaping.*
C5	**Other Local and Regional Impacts**
C5.7	*Contribution to Heat Island Effect from roofing, landscaping and paved areas.*

D - INDOOR ENVIRONMENTAL QUALITY	
D1	**Indoor Air Quality and Ventilation**
D1.4	*TVOC concentration in indoor air*
D1.10	*Ventilation rate*
D2	**Air Temperature and Relative Humidity**
D2.2	*Thermal comfort index*
D3	**Daylighting and Illumination**
D3.1	*Appropriate daylighting in primary occupancies areas*
D4	**Noise and Acoustics**
D4.1	*Noise attenuation through the exterior envelope*

E - SERVICE QUALITY	
E5	**Optimization and Maintenance of Operating Performance**
E5.5	*On-going monitoring and verification of performance-*

F - SOCIAL, CULTURAL AND PERCEPTUAL ASPECTS	
F1	**Social AspectsSocial Aspects**
F1.1	*Universal access on site and within the building*
F2	**Culture and Heritage**
F2.4	*Use of traditional local materials and techniques*

G - COST AND ECONOMIC ASPECTS	
G1	**Cost and Economics**
G1.4	*Use stage energy cost*
G1.5	*Use stage water cost*

b. SBTool criteria selection rationale

In this section PPs must motivate the selection of the criteria that have been included in the regional CESBA MED SBTool. Why the criterion has been included? The reason could depend on regional policies or targets.

A – SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE	
CRITERION	**REASON/MOTIVATION**
A1.8 – *Use of native plant types*	*Reduce water consumption using native plants*
A1.10 – *Provision and quality of children's play area(s)*	*Evaluate the quality of children's playing areas*
A1.12 – *Provision and quality of bicycle pathways and parking*	*Incentive use of bicycle*
A2.1 – *Maximizing efficiency of land use through development density*	*Reduce land consumption*
A3.12 – *Provision of on-site communal transportation system(s)*	*Evaluate the public transport service*

B – ENERGY AND RESOURCES CONSUMPTION	
CRITERION	**REASON/MOTIVATION**
B1.1 – *Primary energy demand*	*Criterion is mandatory*
B1.2 – *Delivered thermal energy demand*	*Criterion is mandatory*
B1.3 – *Delivered electric energy demand*	*Criterion is mandatory*
B1.5 – *Energy from renewable sources in total thermal energy consumption*	*Criterion is mandatory*
B1.6 – *Energy from renewable sources in total electric energy consumption*	*Criterion is mandatory*
B1.11 – *Embodied non-renewable primary energy*	*Not applicable*
B3.1 – *Degree of re-use of suitable existing structure(s) where available*	*Encourage the reuse of existing volumes*
B3.5 – *Recycled materials*	*Not applicable*
B3.7 – *Easy of disassembly, re-use or recycling*	*Evaluate the degree of ease of reuse*
B4.3 – *Use of water for irrigation purposes*	*Evaluate the consumption of irrigation water*
B4.5 – *Potable water consumption for indoor uses*	*Criterion is mandatory*

C – ENVIRONMENTAL LOADINGS	
CRITERION	**REASON/MOTIVATION**
C1.3 – *Global Warming potential*	*Criterion is mandatory*
C3.1 – *Construction and demolition waste.*	*Not applicable*
C3.2 – *Solid waste from building operation.*	*Criterion is mandatory*
C3.3 - *Liquid effluents from building operations that are sent off the site.*	*To minimize the volume of waste water*
C4.1 - *Recharge of groundwater through permeable paving or landscaping.*	*To assess the extent to which natural groundwater in the site is recharged.*
C5.7 - *Contribution to Heat Island Effect from roofing, landscaping and paved areas.*	*Reduce the heat island effect*

D – INDOOR ENVIRONMENTAL QUALITY	
CRITERION	**REASON/MOTIVATION**
D1.4 – *TVOC concentration in indoor air*	*Criterion is mandatory*
D1.10 – *Ventilation rate*	*Criterion is mandatory*
D2.2 – *Thermal comfort index*	*Criterion is mandatory*
D3.1 - *Appropriate daylighting in primary occupancies areas*	*To ensure an adequate level of daylighting in all primary occupied spaces.*
D4.1 - *Noise attenuation through the exterior envelope*	*Evaluate the quality with respect to noise sources*

E – SERVICE QUALITY	
CRITERION	**REASON/MOTIVATION**
E3.1 - *Effectiveness of facility management control system*	*Evaluate the level of building control*
E5.5 - *On-going monitoring and verification of performance*	*Incentive monitoring of buildings*

F – SOCIAL, CULTURAL AND PERCEPTUAL ASPECTS	
CRITERION	**REASON/MOTIVATION**
F1.1 - *Universal access on site and within the building*	*To assess the relative ease of access and use of facilities for persons with mobility or perceptual disabilities.*
F2.4 - *Use of traditional local materials and techniques*	*To assess the extent to which traditional local materials and construction techniques will used in the execution of the project.*

G – COST AND ECONOMIC ASPECTS	
CRITERION	**REASON/MOTIVATION**
G1.4 – *Use stage energy cost*	*Criterion is mandatory*
G1.5 – *Use stage water cost*	*Criterion is mandatory*

c. SBTool weights rationale

In this section PPs must motivate the value of weights assigned to the different issues, categories and criteria. Why the weight of a particular issue or criterion is higher (or lower)? Weights should reflect the regional political priorities.

ISSUE	WEIGHT (1 to 3)	MOTIVATION
A – SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE	**1**	Rigidity of the system
B – ENERGY AND RESOURCES CONSUMPTION	**3**	Political priority; PAC - PAES - EMAS
C – ENVIRONMENTAL LOADINGS	**3**	Political priority; PAC - PAES - EMAS
D – INDOOR ENVIRONMENTAL QUALITY	**2**	Reduced power of intervention - Reduced intervention domain
E – SERVICE QUALITY	**3**	Political priority; PAC - PAES - EMAS
F – SOCIAL CULTURAL AND PERCEPTUAL ASPECTS	**2**	Reduced power of intervention - Reduced intervention domain
G – COST AND ECONOMIC ASPECTS	**2**	Reduced power of intervention - Reduced intervention domain

CATEGORIES	WEIGHT (%)
B1 – In use energy consumptions	87
B3 – Use of materials	0
B4 – Use of water, stormwater and greywater	13
TOTAL	100
C1 – Greenhouse gas emissions	56
C3 – Solid and liquid waste	44
TOTAL	100
D1 – Indoor air quality and ventilation	0
D2 – Thermal comfort	100
TOTAL	100
G1 – Cost and economics	100
TOTAL	100

CRITERIA WEIGHTS

SBTool file A – WeightA-G

B - ENERGY AND RESOURCES CONSUMPTION

B1 – In use energy consumptions

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
B1.1	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.2	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.3	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.5	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.6	*9,0*	*5*	*4*	*2*		*Criterion is mandatory*
B1.11	*11,3*	*5*	*5*	*2*	*0*	*Not applicable*

B3 – Use of materials

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
B3.5	*5,4*	*4*	*3*	*3*	*0*	*Not applicable*

B4 – Use of water, stormwater and greywater

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
B4.5	*8,1*	*4*	*3*	*3*		*Criterion is mandatory*

C - ENVIRONMENTAL LOADINGS

C1 - Greenhouse gas emissions

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
C1.3	*13,5*	*5*	*4*	*3*		*Criterion is mandatory*

C3 - Solid and liquid waste

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
C3.1	*5,4*	*4*	*3*	*2*	*0*	*Not applicable*
C3.2	*5,4*	*4*	*3*	*2*		*Criterion is mandatory*

D - INDOOR ENVIRONMENTAL QUALITY

D1 - Indoor air quality and ventilation

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
D1.4	*1,4*	*1*	*3*	*3*	*0*	*Not applicable*
D1.10	*1,4*	*1*	*3*	*3*	*0*	*Not applicable*

D2 – Thermal comfort

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
D2.2	*1,4*	*1*	*3*	*3*		*Criterion is mandatory*

G - COST AND ECONOMIC ASPECTS

G1 - Cost and economics

CRITERION	Weight (%)	B	C	D	L.F.	L.F. REASON/MOTIVATION
G1.4	*0.9*	*2*	*3*	*1*		*Criterion is mandatory*
G1.5	*0.9*	*2*	*3*	*1*		*Criterion is mandatory*
TOTAL	**100**					

d. SBTool benchmarks rationale

In this section PPs must motivate 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. Please keep in mind that score 3 represents a best practice performance. Score 5 is an excellent performance.

A - SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
A1.8	*The extent of vegetated landscaped area that is planted with native plants.*	*%*	*0: 45*	*UNI PdR 13 ITACA*
			5: 70	*UNI PdR 13 ITACA*
A1.10	*The existence and type of facilities for children's play and the quality of service provided*	*-*	*0: 0*	*UNI PdR 13 ITACA*
			5: 5	*UNI PdR 13 ITACA*
A1.12	*Amount of sheltered and unsheltered bicycle parking, location of bicycle parking facilities relative to building entrances*	*-*	*0: 0*	*UNI PdR 13 ITACA*
			5: 5	*UNI PdR 13 ITACA*
A2.1	*Development density of the project, expressed as the ratio of gross floor area above grade of the Design relative to the maximum permitted gross floor area on the site.*	*%*	*0: 35*	*Current level*
			5: 100	*Maximum exploitation*
A3.12	*Existence and type of an on-site public or communal transportation system*	*-*	*0: 0*	*-*
			5: 5	*-*

B - ENERGY AND RESOURCES CONSUMPTION				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
B1.1	*Primary energy demand*	*kWh/m2/y*	*0: 140*	*-*
			5: 23	*Energy regulation*
B1.2	*Delivered thermal energy demand*	*kWh/m2/y*	*0: 80*	*-*
			5: 10	*Energy regulation*
B1.3	*Delivered electric energy demand*	*kWh/m2/y*	*0: 23*	*Insert your comment here*
			5: 5	*Insert your comment here*
B1.5	*Energy from renewable sources in total thermal energy consumption*	*%*	*0: 25*	*-*
			5: 50	*D.Leg. 28/11*
B1.6	*Energy from renewable sources in total electric energy consumption*	*%*	*0: 35*	*-*
			5: 75	*-*

B1.11	*Embodied non-renewable primary energy*	*kWh/m2/y*	*0: -*	*Non applicable*
			5: -	*Non applicable*
B3.1	*Degree of re-use of suitable existing structure(s) where available*	*%*	*0: 0*	*UNI PdR 13 ITACA*
			5: 100	*UNI PdR 13 ITACA*
B3.5	*Recycled materials*	*%*	*0: 15*	*UNI PdR 13 ITACA*
			5: 50	*UNI PdR 13 ITACA*
B3.7	*Easy of disassembly, re-use or recycling*	*-*	*0: 0*	*Scenario*
			5: 5	*Scenario*
B4.3	*Use of water for irrigation purposes*	*m3 / m2 year*	*0: 0,20*	*UNI PdR 13 ITACA*
			5: 0,05	*-*
B4.5	*Water consumption for indoor uses*	*m3 occupant/ year*	*0: 10,50*	*UNI PdR 13 ITACA*
			5: 5,25	*-*

C - ENVIRONMENTAL LOADINGS

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
C1.3	*Global Warming potential*	*kg CO2 eq./m2/yr*	*0: 28*	*-*
			5: 5	*Energy regulation*
C3.1	*Construction and demolition waste.*	*kg/m^2/life cycle stage*	*0: -*	*Non applicable*
			5: -	*Non applicable*
C3.2	*Solid waste from building operation.*	*%*	*0: 14*	*At least one*
			5: 100	*All the services*
C3.3	*Liquid effluents from building operations that are sent off the site.*	*m3 / pp*yr*	*0: 0,13*	*UNI PdR 13 ITACA*
			5: 0	*UNI PdR 13 ITACA*
C4.1	*Recharge of groundwater through permeable paving or landscaping.*	*%*	*0: 40*	*UNI PdR 13 ITACA*
			5: 60	*UNI PdR 13 ITACA*
C5.7	*Contribution to Heat Island Effect from roofing, landscaping and paved areas.*	*%*	*0: 0*	*UNI PdR 13 ITACA*
			5: 100	*UNI PdR 13 ITACA*

D - INDOOR ENVIRONMENTAL QUALITY

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
D1.4	*TVOC concentration in indoor air*	*µg per cube meter*	*0: 2000*	*UNI PdR 13 ITACA*
			5: 1000	*<1500 limit CAM = 3*

D1.10	*Ventilation rate*	*l/s/m²*	*0: 0,2*	*UNI EN 15251 Table B.2 Cat III*
			5: 0,5	*UNI EN 15251 Table B.2 Cat I*
D2.2	*Thermal comfort index*	*%*	*0: 10*	*UNI EN ISO 7730 Class B*
			5: 6	*UNI EN ISO 7730 Class A*
D3.1	*Appropriate daylighting in primary occupancies areas*	*%*	*0: 100*	*Reference law*
			5: 125	*UNI PdR 13 ITACA*
D4.1	*Noise attenuation through the exterior envelope*	*STC-Rw*	*0: 37*	*Standard window*
			5: 45	*Best window*

E - SERVICE QUALITY

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
E3.1	*Effectiveness of facility management control system*	-	*0: 0*	*Scenario*
			5: 5	*Scenario*
E5.5	*On-going monitoring and verification of performance*	-	*0: 0*	*Scenario*
			5: 5	*Scenario*

F - SOCIAL CULTURAL AND PERCEPTUAL ASPECTS

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
F1.1	*Universal access on site and within the building*	-	*0: 0*	*Scenario*
			5: 5	*Scenario*
F2.4	*Use of traditional local materials and techniques*	*%*	*0: 30*	*UNI PdR 13 ITACA*
			5: 80	*UNI PdR 13 ITACA*

G - COST AND ECONOMIC ASPECTS

CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
G1.4	*Use stage energy cost*	*€/m2/yr*	*0: 10,70*	-
			5: 1,75	*Energy regulation*
G1.5	*Use stage water cost*	*€/m2/yr*	*0: 1,55*	-
			5: 0,70	*Energy regulation*

e. SBTool Criteria Specifications

In this section PPs must indicate for each selected criterion:

- *Information source: The source of the data/information that will be used to characterize the value of the indicator. Example: monitored data, measured data, statistic data, models and simulation, studies, data banks, etc.*
- *Assessment method: Short and concise description of the assessment method used to verify the value of indicators. Example: calculation steps, data analysis process, monitoring procedure, content of a study, use of statistic data, etc.*
- *Standards: technical documents taken as reference for the assessment method.*

A - SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
A1.8	*The extent of vegetated landscaped area that is planted with native plants*	*Information source*	*Assessment by landscape architect*
		Assessment method	*The percent of landscaped area (excuding paved areas) planted with native species*
		Standard	*UNI PdR 13 ITACA*
A1.10	*The existence and type of facilities for children's play and the quality of service provided*	*Information source*	*Assessment by landscape architect*
		Assessment method	*Evaluation scenario*
		Standard	*UNI PdR 13 ITACA*
A1.12	*Amount of sheltered and unsheltered bicycle parking, location of bicycle parking facilities relative to building entrances*	*Information source*	*Rilievo*
		Assessment method	*Evaluation scenario*
		Standard	*UNI PdR 13 ITACA*
A2.1	*Development density of the project, expressed as the ratio of gross floor area above grade of the Design relative to the maximum permitted gross floor area on the site.*	*Information source*	*PRGC*
		Assessment method	*The ratio of gross floor area above grade of the Design relative to the maximum permitted gross floor area on the site*
		Standard	*Current situation*

A3.12	*Existence and type of an on-site public or communal transportation system.*	*Information source*	*Hours of public service*
		Assessment method	*Evaluation scenario*
		Standard	-

B - ENERGY AND RESOURCES CONSUMPTION			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
B1.1	*Primary energy demand per internal useful floor area per year*	*Information source*	*Consumption bills*
		Assessment method	*Calculated using the measured values*
		Standard	*Energy regulation*
B1.2	*Delivered thermal energy demand per internal useful floor area per year*	*Information source*	*Energy bills*
		Assessment method	*Calculated using the measured values*
		Standard	*Energy regulation*
B1.3	*Delivered electric energy demand per internal useful floor area per year*	*Information source*	*Energy bills*
		Assessment method	*Calculated using the measured values*
B1.5	*Share of renewable energy in final thermal energy consumptions*	*Standard*	*Reference of the law*
		Information source	*Monitoring of produced energy*
		Assessment method	*Calculated using the measured values*
B1.6	*Share of renewable energy in final electric energy consumption*	*Standard*	*Reference of the law*
		Information source	*Monitoring of produced energy*
		Assessment method	*Calculated using the measured values*
B1.11	*Embodied non-renewable primary energy*	*Standard*	-
		Information source	*Non applicable*
		Assessment method	-
B3.1	*Degree of re-use of suitable existing structure(s) where available*	*Standard*	-
		Information source	*Executive projects*
		Assessment method	*The percentage (by area) of existing sound structures that is planned to be re-used as part of the project*
		Standard	*UNI PdR 13 ITACA*

B3.5	*Wight of recycled materials on total weight of materials.*	*Information source*	*Non applicable*
		Assessment method	*-*
		Standard	*UNI PdR 13 ITACA*
B3.7	*Easy of disassembly, re-use or recycling*	*Information source*	*Executive projects*
		Assessment method	*Scenario*
		Standard	*Scenario*
B4.3	*Use of water for irrigation purposes*	*Information source*	*Consumption bills*
		Assessment method	*Volume of water on gross surface*
		Standard	*UNI PdR 13 ITACA*
B4.5	*Potable water consumption per occupant per year*	*Information source*	*Consumption bills*
		Assessment method	*Calculated using the measured values*
		Standard	*UNI PdR 13 ITACA*

C – ENVIRONMENTAL LOADINGS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
C1.3	*CO2 equivalent emissions per internal useful floor area per year*	*Information source*	*Energy bills*
		Assessment method	*Calculated using the estimate based on the measures*
		Standard	*Energy regulation*
C3.1	*Weight of waste and materials generated per 1 m2 of useful floor area demolished or constructed*	*Information source*	*Non applicable*
		Assessment method	*-*
		Standard	*-*
C3.2	*Ratio of the number of collectable solid waste categories within a 100 m distance from the building's entrance to the reference solid waste categories*	*Information source*	*Relief and georeferencing containers*
		Assessment method	*Calculated using the measured values*
		Standard	*-*

C3.3	*Liquid effluents from building operations that are sent off the site.*	*Information source*	*Bills*
		Assessment method	*The predicted volume of liquid waste per year to be sent off the site for treatment*
		Standard	*UNI PdR 13 ITACA*
C4.1	*Recharge of groundwater through permeable paving or landscaping.*	*Information source*	*Design documents and on-site surveys*
		Assessment method	*The predicted percentage of precipitation that is able to recharge groundwater through permeable paving or landscaping.*
		Standard	*UNI PdR 13 ITACA adapted*
C5.7	*Contribution to Heat Island Effect from roofing, landscaping and paved areas.*	*Information source*	*Design documents and on-site surveys*
		Assessment method	*Percentuale di superficie ad elevato incide di riflessione*
		Standard	*UNI PdR 13 ITACA*

D – INDOOR ENVIRONMENTAL QUALITY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
D1.4	*TVOC concentration in indoor air*	*Information source*	Not applicable
		Assessment method	-
		Standard	*UNI PdR 13 ITACA*
D1.10	*Ventilation rate normalized per useful floor area*	*Information source*	*Not applicable*
		Assessment method	
		Standard	*UNI EN 15251*
D2.2	*Predicted Percentage Dissatisfied (PPD)*	*Information source*	-
		Assessment method	-
		Standard	*UNI EN ISO 7730 Class B*

D3.1	Daylighting and Illumination	*Information source*	Design documents
		Assessment method	*Rapporto fra DF e DF lim*
		Standard	*UNI PdR 13 ITACA*
D4.1	Noise attenuation through the exterior envelope	*Information source*	Design documents
		Assessment method	*Ratio between DF and DF lim*
		Standard	*Standard window*

E – SERVICE QUALITY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
E3.1	*Effectiveness of facility management control system*	*Information source*	*Design documents*
		Assessment method	*Scenario*
		Standard	*Scenario*
E5.5	*On-going monitoring and verification of performance*	*Information source*	*Contract documentation.*
		Assessment method	*Scenario*
		Standard	*Scenario*

F – SOCIAL CULTURAL AND PERCEPTUAL ASPECTS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
F1.1	*Universal access on site and within the building*	*Information source*	*Design documents*
		Assessment method	*Scenario*
		Standard	*Scenario*
F2.4	*Use of traditional local materials and techniques*	*Information source*	*Design documents*
		Assessment method	*The estimated percentage of traditional local materials*
		Standard	*UNI PdR 13 ITACA*

G – COST AND ECONOMIC ASPECTS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
G1.4	*Energy annual cost per usable floor area*	*Information source*	*Consumption bills*
		Assessment method	*Energy annual cost per usable floor area*
		Standard	*Energy regulation*
G1.5	*Water annual cost per usable floor area*	*Information source*	*Consumption bills*
		Assessment method	*Water annual cost per usable floor area*
		Standard	*Energy regulation*

3. DIAGNOSIS

a. Performance scores

Evaluation of the actual performance and relative level of sustainability of the Building.
PPs have to indicate the scores reached.

	SCORE
B – ENERGY AND RESOURCES CONSUMPTION	
B1 – In use energy consumptions	
B1.1 – Primary energy demand	0,8
B1.2 – Delivered thermal energy demand	-1,0
B1.3 - Delivered electric energy demand	3,9
B1.5 – Energy from renewable sources in total thermal energy consumption	-1,0
B1.6 – Energy from renewable sources in total electric energy consumption	-1,0
B1.11 – Embodied non-renewable primary energy	N.A.
B3 – Use of materials	
B3.5 – Recycled materials	N.A.
B4 – Use of water, stormwater and greywater	
B4.5 – Potable water consumption for indoor uses	-1,0
C- ENVIRONMENTAL LOADINGS	
C1 – Greenhouse gas emissions	
C1.3 – Global Warming potential	0,2
C3 – Solid and liquid waste	
C3.1 – Construction and demolition waste.	N.A.
C3.2 – Solid waste from building operation.	-1,0
D- INDOOR ENVIRONMENTAL QU	
D1 – Indoor air quality and ventilation	
D1.4 – TVOC concentration in indoor air	N.A.
D1.10 – Ventilation rate	N.A.
D2 – Thermal comfort	
D2.2 – Thermal comfort index	-1,0
G- COST AND ECONOMIC ASPECTS	
G1 – Cost and economics	
G1.4 – Use stage energy cost	1,9
G1.5 – Use stage water cost	0,4

d. Key Performance Indicators value

KPI	Indicator	Unit of measure	Value
B1.1 – Primary energy demand	Primary energy demand per internal useful floor area per year	kWh/m^2/yr	122,36
B1.2 – Delivered thermal energy demand	Delivered thermal energy demand per internal useful floor area per year	kWh/m^2/yr	95.74
B1.3 – Delivered electric energy demand (in use stage)	Delivered electric energy demand per internal useful floor area per year	kWh/m^2/yr	9,02
B1.5 – Energy from renewable sources in total final thermal energy consumption	Share of renewable energy in final thermal energy consumptions	%	0,43
B1.6 – Energy from renewable sources in total electric energy consumption	Share of renewable energy in final electric energy consumption	%	0
B1.11 – Embodied non-renewable primary energy	Embodied primary non-renewable energy per area	MJ/m^2	Non Applicable
B.3.5 – Recycled materials	Weight of recycled materials on total weight of materials.	%	Non Applicable
B.4.5 – Potable water consumption for indoor uses	Potable water consumption per occupant per year	m^{37} occupant/year	52,39
C.1.3 – Greenhouse Gas Emissions (in use stage)	CO_2 equivalent emissions per useful internal floor area per year	kg CO_2 eq./m2/yr	26,94
C.3.1 – Construction and demolition waste	Weight of waste and materials generated per 1 m^2 of useful floor area demolished or constructed	kg/m^2/life cycle stage	Non Applicable
C.3.2 – Solid waste from building operation	Ratio of the number of collectable solid waste categories within a 100 m distance from the building's entrance to the reference solid waste categories	%	0,00
D1.4 – TVOC concentration in indoor air	TVOC concentration in indoor air	µg per cube meter	Non Applicable
D1.10 – Ventilation rate	Ventilation rate normalized per useful floor area	l/s/m^2	Non Applicable
D2.2 – Thermal comfort index	Predicted Percentage Dissatisfied (PPD)	%	Not detected
G.1.4 Use stage energy cost	Energy annual cost per usable floor area	€/m2/yr	7,35
G.1.5 Use stage water cost	Water annual cost per usable floor area	€/m2/yr	1,48

b. Actual performance analysis

WEAKNESSES ASPECTS	*The analyzed building is part of a larger school complex with the presence also of spaces used by extracurricular sports associations.* *The presence of a large area on the ground and a partially insulated metal roof, do not allow the implementation of energy redevelopment interventions with reduced economic investments.*
STRENGHT ASPECTS	*The school's thermal system is connected to the only thermoelectric plant in the entire school complex.* *Some spaces are underused and could not be heated.*
POTENTIAL FOR PERFORMANCE IMPROVEMENT	*It is possible to install a photovoltaic system able to cover both electricity consumption of the school and consumptions generated by sports facilities.*

4. STRATEGIC DEFINITION

a. Performance targets

Each partner must establish a target value for each criterion in the SBTool.

The target values have to reflect the global Environmental, Social and Economic targets established at urban level.

A - SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE			
A1 - Site Regeneration and Development			
A1.8 - Use of native plant types		Actual value	94,61
A The extent of vegetated landscaped area that is planted with native plants	%	Target value	60
A1.10 - Use of native plant types		Actual value	-1
The existence and type of facilities for children's play and the quality of service provided	-	Target value	3
A1.12 - Provision and quality of bicycle pathways and parking		Actual value	-1
Amount of sheltered and unsheltered bicycle parking, location of bicycle parking facilities relative to building entrances	-	Target value	3
A2 - Urban Design			
A2.1 - Maximizing efficiency of land use through development density		Actual value	53,24
Development density of the project, expressed as the ratio of gross floor area above grade of the Design relative to the maximum permitted gross floor area on the site.	%	Target value	100
A3 - Project Infrastructure and Services			
A3.12 - Maximizing efficiency of land use through development density		Actual value	0
Existence and type of an on-site public or communal transportation system	-	Target value	3

B - ENERGY AND RESOURCES CONSUMPTION			
B1 - In use energy consumptions			
B1.1 - Primary energy demand		Actual value	122,36
Primary energy demand per internal useful floor area per year	kWh/m2/yr	Target value	73
B1.2 - Delivered thermal energy demand		Actual value	95.74
Delivered thermal energy demand per internal useful floor area per year	kWh/m2/yr	Target value	57
B1.3 - Delivered electric energy demand		Actual value	9,02
Annual delivered electric demand per useful internal floor area	kWh/m2/yr	Target value	5
B1.5 - Energy from renewable sources in total final thermal energy consumption		Actual value	0,43
Share of renewable energy in final thermal energy consumptions	%	Target value	40

B1.6 - Energy from renewable sources in total electric energy consumption		Actual value	0,00
Share of renewable energy in final electric energy consumption	%	Target value	59
B1.11 - Embodied non-renewable primary energy		Actual value	Non Applicable
Embodied primary non-renewable energy	MJ/m^2	Target value	
B2 - Embodied energy			
B3 - Use of materials			
B3.1 - Degree of re-use of suitable existing structure(s) where available		Actual value	100
The percentage (by area) of existing sound structures that is planned to be re-used as part of the project :	%	Target value	50
B3.5 - Recycled materials		Actual value	Non Applicable
Weight of recycled materials on total weight of materials.	%	Target value	36
B3.7 - Easy of disassembly, re-use or recycling		Actual value	- 0
Review of contract documentation by an outside deconstruction specialis	-	Target value	3
B4 - Use of water, stormwater and greywater			
B4.3 - Use of water for irrigation purposes		Actual value	0,22
The predicted gross annual potable water volume to be used for irrigation purposes in m3 / m2 per year of landscaped area (before accounting for re-use of greywater and rainwater).	m3/m2/year	Target value	0,11
B4.5 - Water consumption for indoor uses		Actual value	52,39
Water consumption per occupant per year	m^3/occupant/year	Target value	7,35

C - ENVIRONMENTAL LOADINGS			
C1 - Greenhouse gas emissions			
C1.3 - Greenhouse Gas Emissions (in use stage)		Actual value	26,94
CO_2 equivalent emissions per useful internal floor area per year	kg CO_2 eq./m^2/yr	Target value	22
C3 - Solid and liquid waste			
C3.1 - Construction and demolition waste.		Actual value	Non Applicable
Weight of waste and materials generated per 1 m2 of useful floor area demolished or constructed	kg/m2/life cycle stage	Target value	-
C3.2 - Solid waste from building operation.		Actual value	0,00
Ratio of the number of collectable solid waste categories within a 100 m distance from the building's entrance to the reference solid waste categories	%	Target value	71%
C3.3 - Liquid effluents from building operations that are sent off the site		Actual value	1,31
Ratio between the number of collectable solid waste types in a 50 meters distance from the building's entrance and the reference solid waste categories.	m^3 / pp*yr m^3 / m^2*yr	Target value	5

C4 - Impacts on Project Site			
C4.1 - Recharge of groundwater through permeable paving or landscaping.		Actual value	52,96
The predicted percentage of precipitation that is able to recharge groundwater through permeable paving or landscaping	%	Target value	50
C5 - Other Local and Regional Impacts			
C5.7 - Contribution to Heat Island Effect from roofing, landscaping and paved areas.		Actual value	64,31
Rapporto tra la superficie parametrizzata con i coefficienti di riflessioni e la superficie totale	%	Target value	60

D - INDOOR ENVIRONMENTAL QUALITY			
D1 - Indoor air quality and ventilation			
D1.4 - TVOC concentration in indoor air		Actual value	Non Applicable
TVOC concentration in indoor air	µg/m^3	Target value	1500
D1.10 – Ventilation rate		Actual value	Non Applicable
Ventilation rate normalized per useful floor area	l/s/m^2	Target value	0,3 Cat.II
D2 - Air Temperature and Relative Humidity			
D2.2 - Thermal comfort index		Actual value	Not detected
Predicted Percentage Dissatisfied (PPD)	%	Target value	7
D3 - Daylighting and Illumination			
D3.1 - Appropriate daylighting in primary occupancies areas		Actual value	Not detected
The predicted Daylight Factor in a typical occupancy area located on the ground floor of the building, as indicated by drawings and specifications	%	Target value	115
D4 - Noise and Acoustics			
D4.1 - Noise attenuation through the exterior envelope		Actual value	<37
The predicted noise attenuation performance of the exterior wall most exposed to potential sources of noise, as indicated by design characteristics.	STC	Target value	42

E - SERVICE QUALITY			
E3 - Controllability			
E3.1 – Effectiveness of facility management control system		Actual value	-1
The presence of a computerized building management control system whose capability is consistent with the complexity of building systems.	-	Target value	3
E5 - Optimization and Maintenance of Operating Performance			
E5.5 – On-going monitoring and verification of performance		Actual value	-1
The provision of energy sub-metering systems and water consumption monitoring systems, according to design documentation.	-	Target value	3

F - SOCIAL CULTURAL AND PERCEPTUAL ASPECTS			
F1 - Social Aspects			
F1.1 - Universal access on site and within the building		Actual value	-1
The scope and quality of design measures planned to facilitate access and use of building facilities by persons with disabilities.	-	Target value	3
F2 - Culture and Heritage			
F2.4 - Use of traditional local materials and techniques		Actual value	40
Percent of the non-structural elements of the building will be constructed using traditional local materials and construction techniques.	%	Target value	60

G - COST AND ECONOMIC ASPECTS			
G1 - Cost and economics			
G1.4 - Use stage energy cost		Actual value	7,35
Energy annual cost per usable floor area	€/m2/yr	Target value	3
G1.5 - Use stage water cost		Actual value	1,48
Water annual cost per usable floor area	€/m2/yr	Target value	1,50

b. Constraints and restrictions

CONSTRAINTS / RESTRICTIONS	
Legal constraints	*P.R.G.C. current and Building Regulations. Communication of the 19/08/2016 of the Archaeological, fine Arts and Landscape Supervision Office of Friuli Venezia Giulia. Memorandum of understanding with Udine Prefecture*
Technical constraints	*-*
Financial constraints	*Announcement for the preparation of the extraordinary program of intervention for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978. "Experimental City" provides 18 public works to be realized autonomously for a total of € 17,550,000 and an action for € 750,000 proposed together with AcegaApsAmga, through an operating agreement, aimed to increase the safety (public lighting with very low consumption and remote control, vehicle license plate control, video surveillance, safety of pedestrian crossings with new systems, etc.). The total cost of the project is estimated at € 29.86 million.*
Environmental condition constraints	*-*
Stakeholder based restrictions	*Company Ferrovie Udine Cividale s.r.l. - project for the construction of the "San Gottardo" intermodal passenger center;*

	FIAB Udine / Abicitudine Association - project for bicycle repair; *Macross Association - project for new cohousing strategies; design, constitution and management of cultural artistic activities;* *AcegasApsAmga S.p.A. - project for the realization of "Smart City" technological systems and integration with public facilities lighting;* *Rugby Udine Union FVG s.r.l. - participation in the Educational Sports Table;* *ATER Udine - project for urban redevelopment and enhancement of the territorial security of the "Aurora" district for a "new way of living"in public housing;* *UISP Udine - management project for the practice of competitive sports, amateur, school, cultural and recreational activities;* *FININT SGR S.p.A. - project for the construction of 80 apartments in the former Osoppo Barracks*
Other relevant constraints	-

c. Potential strategies at urban scale

Synergy zones	
Energetic synergies	-
Water synergies	-
Waste synergies	-
Mobility synergies	-
Other synergies	-

5. DECISION MAKING

a. Description of scenarios

NAME OF SCENARIO	DESCRIPTION
1. ExperimentalCIty	Experimental city beyond the boundaries of living an opportunity for urban regeneration for the eastern area of Udine The East Udinese quadrant can be assumed as a manifesto of Friuli: a crossroads of peoples and details of a minor history, but also characterized by precious architectural evidence that can be transformed into an experimental laboratory for new ways of living and sustainability. Not only. The East Udinese area is a border area: until 1900 border between city and countryside (rurality witnessed by the presence of farmhouses and farmhouses). From the early years of the same century until the end of the Cold War, it was the eastern border of the Iron Curtain: three large barracks were established (Osoppo, Cavarzerani and Spaccamela). Summary of the objectives of the Experimental City project - Improve and qualify urban decorum; - Increase territorial security and capacity for urban resilience; - Reinforce the settlement character of the former Osoppo and Cavarzerani barracks by constructing a "piece of city" that could be a centrality of services and public spaces throughout the eastern area of Udine; - Improve and (re) activate forms of mobility not only focused on private vehicles; - Develop a multiplicity of forms of housing, work and "being together" in the public dimension; - Reduce global emissions, energy consumption, consumption of natural resources, including land consumption; - Improve the quality of life of citizens, especially weak users; - Guaranteeing equal opportunities; - Manage sustainability in a rational and consistent manner.

b. Scenarios raking

i. Performance Scores

Issues	Current state	Scenario 1
TOTAL SCORE	**0,0**	**0,6**
B – Energy and Resources C.	0,2	0,7
C – Environmental Loadings	-0,3	0,4
D – Indoor Env. Quality	-1,0	-1,0
G – Cost and Economic Asp.	1,1	1,6

ii. Key Performance Indicators

SCENARIO 1			
KPI	**Indicator**	**Unit of measure**	**Value**
B1.1 – Primary energy demand	Primary energy demand per internal useful floor area per year	kWh/m^2/yr	91,16
B1.2 – Delivered thermal energy demand	Delivered thermal energy demand per internal useful floor area per year	kWh/m^2/yr	66,03
B1.3 – Delivered electric energy demand (in use stage)	Delivered electric energy demand per internal useful floor area per year	kWh/m^2/yr	9,02
B1.5 – Energy from renewable sources in total final thermal energy consumption	Share of renewable energy in final thermal energy consumptions	%	0,62
B1.6 – Energy from renewable sources in total electric energy consumption	Share of renewable energy in final electric energy consumption	%	0
B1.11 – Embodied non-renewable primary energy	Embodied primary non-renewable energy per area	MJ/m^2	Non Applicable
B.3.5 – Recycled materials	Weight of recycled materials on total weight of materials.	%	Non Applicable
B.4.5 – Potable water consumption for indoor uses	Potable water consumption per occupant per year	m^3/occupant/year	52,39
C.1.3 – Greenhouse Gas Emissions (in use stage)	CO2 equivalent emissions per useful internal floor area per year	kg CO2 eq./m^2/yr	20,70

C.3.1 – Construction and demolition waste	Weight of waste and materials generated per 1 m2 of useful floor area demolished or constructed	kg/m2/life cycle stage	Non Applicable
C.3.2 – Solid waste from building operation	Ratio of the number of collectable solid waste categories within a 100 m distance from the building's entrance to the reference solid waste categories	%	0,00
D1.4 – TVOC concentration in indoor air	TVOC concentration in indoor air	µg per cube meter	Non Applicable
D1.10 – Ventilation rate	Ventilation rate normalized per useful floor area	l/s/m2	Non Applicable
D2.2 – Thermal comfort index	Predicted Percentage Dissatisfied (PPD)	%	Not detected
G.1.4 Use stage energy cost	Energy annual cost per usable floor area	€/m2/yr	5,59
G.1.5 Use stage water cost	Water annual cost per usable floor area	€/m2/yr	1,48

iii. Financing mechanisms evaluation

Scenario 1	Announcement for the preparation of the extraordinary program of public work for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978.

iv. Synergies at urban level

Scenario 1	Urban redevelopment developed on the basis of a common strategic project in order to coordinate multiple actions carried out by different public and private bodies.

6. RETROFIT CONCEPT

SELECTED SCENARIO	DESCRIPTION
1.	Energy requalification of two buildings.

KEY ELEMENTS OF THE CONCEPT

Retrofits Strategies	Redevelopment of two buildings
Performance improvement	Reduction of greenhouse gas emissions.
	Reduction of energy costs.
Financial mechanism	Announcement for the preparation of the extraordinary program of public work for urban redevelopment and security of the suburbs of metropolitan cities and municipalities of the provincial capital, approved by D.P.C.M. 25 May 2016 implementing the Law of 28 December 2015, n. 208, Article 1, paragraphs 974, 975, 976, 977 and 978.