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

Responsible Partner: Andrea Moro, iiSBE Italia R&D

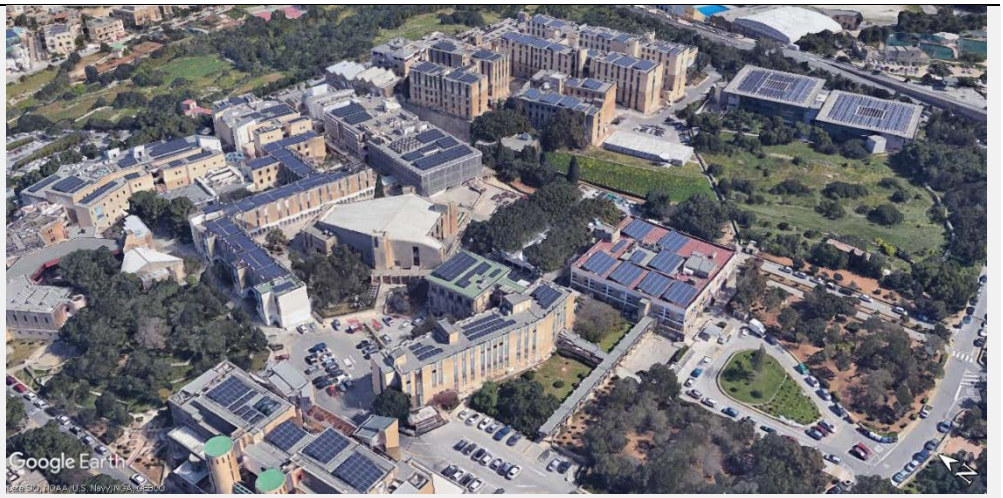
INDEX

URBAN SCALE ASSESSMENT

1. INITIATION

General information on the selected urban area

City	*Msida, University Of Malta, Malta*
Brief description	*The test area is the University of Malta (UM) with 11.78ha of land. The UM is composed of fourteen faculties.*
Size (ha)	*27ha*
Residential population	*14,000*
Average building density (total m2/land surface m2)	*12.8%*
Plan of the urban area	
Significant pictures	


Google Earth


Google Earth

	
Description of the adjacent areas	*The UM is in the centre of Malta. It has the national hospital (Mater Dei) adjacent to it.*
Property ownership	*University of Malta- Government*
Social and economic context	*The University of Malta is the highest educational institution of Malta. It also employs around 2,500 workers.*
Legal /administrative boundary lines	/
Energy supply infrastructure	*Electrical energy supply infrastructure is owned and operated by Enemalta, the only energy company in Malta.*
Relevance of the surrounding infrastructures	*The UM has major infrastructures close to it: The 'Skatepark' junction and the newely renovated 'Kappara' Junction. The area is almost busy all the time and traffic can be found frequently.*
Reference stakeholders in retrofit process	/
Other significant information	/

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**
A1.1	*Concentration of land parcels.*
A1.2	*Urban compactness*
A1.4	*Residential density*
A1.5	*Urban street canyons (H/W aspect ratio)*
A1.6	*Homogeneity of Land*
A1.7	*Conservation of Land*
A2	**Transportation Infrastructure**
A2.2	*Walking distance to public transport for area workers and students.*
A2.3	*Extent and connectivity of pedestrian streets and walkways.*
A2.9	*On-street and indoor parking spaces relative to local population.*

B- ECONOMY	
B1	**Economic Structure and Value**
B1.4	*Impact of land values on adjacent areas.*
B2	**Economic Activity**
B2.3	*Employment rate*
B3	**Cost and Investment**
B3.3	Operating energy costs for public building

C- ENERGY	
C1	**Non- Renewable Energy**
C1.1	*Total final thermal energy consumption for building operations.*
C1.3	*Total final thermal energy consumption for non residential building operations.*
C1.4	*Total final electrical energy consumption for building operations.*
C1.6	*Total final electrical energy consumption for non residential building operations.*
C1.7	*Total primary energy demand for building operations*
C2	***Renewable and Decarbonised Energy***
C2.1	*Share of renewable energy on-site, on total final energy consumptions for buildings operation.*
C2.4	*Share of renewable energy on-site, on total primary energy consumptions for buildings operation.*
C2.7	*Share of electric energy generation from on-site renewable sources on final electric energy./ Share of renewable energy on-site, on final electric energy consumptions.*

D- ATMOSPHERIC EMISSIONS	
D1	**Atmospheric Emissions**
D1.2	*GHG emissions from energy used for all purposes in building operations.*

E- NON - RENEWABLE RESOURCES	
E1	**Potable water, stormwater and greywater**
E1.1	*Availability of a public municipal water supply.*
E1.4	*Re-use of rainwater in non-residential building.*
E1.5	*Re-use of stormwater.*
E1.7	*Consumption of potable water for non-residential building systems.*
E2	**Solid and Liquid Wastes**
E2.1	*Solid waste and recycling collection points.*
E2.2	*Separate collection and disposal of solid waste and recycling.*
E2.3	*Solid waste from construction and demolition projects retained in the area for re-use or recycling.*

F- ENVIRONMENT	
F1	**Environmental Impacts**
F1.1	*Impact of construction activities on natural features*
F1.2	*Impact of construction activities or landscaping on soil stability or erosion.*
F1.3	*Recharge of groundwater through permeable paving or landscaping.*
F1.4	*Changes in biodiversity.*
F1.7	*Impact of local building user population on peak load capacity of public transport system.*
F1.8	*Impact of private vehicles used by the local population on peak load capacity of the local road system.*
F2	**Outdoor Environmental Quality**
F2.10	*Ambient daytime noise conditions.*
F2.11	*Ambient night-time noise conditions.*
F3	**Ecosystems and Landscapes**
F3.1	*Green zones & recreation areas availability*
F3.2	*Green zones & recreation areas accessibility*
F3.3	*Green zones & recreation areas density*
F3.6	*Tree coverage for shade and management of local ambient temperatures.*
F3.7	*Green roofs.*
F3.10	*Ecological diversity in the area*

G- SOCIAL ASPECTS	
G1	**Safety and Accessibility**
G1.1	*Buildings that are accessible for use by physically disabled persons.*
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.*
G1.5	*Objective/subjective safety measures.*
G2	**Traffic and Mobility Services**
G2.1	*Performance of the public transport service..*
G2.4	*Quality of pedestrian and bicycle network.*
G2.5	*Availability of sheltered bicycle parking facilities.*

G3	**Communication Services**
G3.1	*Availability of a broadband communication network*
G3.2	*Access to a broadband communication network.*
G4	**Public and private facilities and services**
G4.1	*Availability and proximity of key food and retail services*
G4.2	*Availability and proximity of key public human services*
G6	**Management and community involvement**
G6.1	*Involvement of residents in community affairs.*
G6.3	*Community involvement in urban planning activities*
G7	**Society, Culture and Heritage**
G7.1	*Compatibility of urban design with local cultural values.*
G7.2	*Compatibility of public open space with local cultural values.*
G7.4	*Use of traditional local materials and techniques*
G7.5	*Maintenance of UNESCO or other protected landscapes*
G8	**Perceptual**
G8.2	*Panoramic and scenic routes or view points.*
G8.3	*Perceived safety of public areas for pedestrians.*
G8.4	*Impact of commercial signage on the visual environment.*
G8.5	*Impact of overhead electric distribution system on the visual environment.*
G8.6	*Perceptual quality of area development.*
G8.7	*Aesthetic quality of new facility exteriors.*

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.…). Policy/ Regulation

A- BUILT URBAN SYSTEMS	
CRITERION	**REASON/MOTIVATION**
A1.1 ***Concentration of land parcels***	*Area in Malta is very limited with regards to the total population. This indicator is therefore vital for the conservation of space.*
A1.2 ***Urban compactness***	*It is important to maximise the use of land used for buildings due to the reason mentioned in A1.1.*
A1.4 ***Residential density***	*It is important to measure the density of buildings in the local area due to the reason mentioned in A1.1.*
A1.5 ***Urban street canyons (H/W aspect ratio)***	*The local Development Control Design Policy 2015 (DC 15) gives various examples of height to road width ratios. The averaged out number is: 2.31.*
A1.6 ***Homogenity of Land***	*Important to assess the voids of the urban fabric.*
A1.7 ***Conservation of Land***	*Undeveloped land considered to be of value for ecological or agricultural purposes. Locally these areas are named 'Outside Development Zone' (ODZ) where development is restricted.*
A2.2 ***Walking distance to public transport for area workers and students.***	*This indicator was chosen since public transport needs to be given a higher priority in order to discourage citizens in using their own private car. Locally, traffic is a number one issue.*
A2.3 ***Extent and connectivity of pedestrian streets and walkways.***	*Since traffic is a number one issue, more walkways and pedestrianized streets would discourage the citizens in using their own private vehicle.*
A2.9 ***On-street and indoor parking spaces relative to local population.***	*Same reason mentioned in A2.2 and A2.3. Since traffic is a number one issue, more parking spaces encourage people to use their own private car. Making it more difficult for people to find a parking space means a better chance that they will use public transport.*

B- ECONOMY	
CRITERION	**REASON/MOTIVATION**
B1.4 ***Impact of land values on adjacent areas***	*A certain level of external and internal capital investment in the local area is needed to ensure that the property market remains healthy and that business enterprises can function.*
B2.3 ***Employment Rate***	*The employment rate of a country shows the economic situation. This indicator is therefore very important.*

B3.3 ***Operating energy costs for public building***	*N.A*

C- ENERGY

CRITERION	REASON/MOTIVATION
C1.1 ***Total final thermal energy consumption for building operations.***	*It is important to know how much of the energy usage is being driven towards thermal energy consumption (both heating and cooling). 4 buildings were considered in this case, ignoring the IT Services building, where industrial cooling systems are installed to keep the datacentre at a safe operating temperature.*
C1.3 ***Total final thermal energy consumption for non residential building operations.***	*Since the University of Malta campus is a non-residential neighbourhood, then the value of this is indicator is the same as C1.1.*
C1.4 ***Total final electrical energy consumption for building operations.***	*It is important to know how much electrical energy is being used in the neighbourhood per m^2 of useful area.*
C1.6 ***Total final electrical energy consumption for non residential building operations.***	*Same as in C1.3, UM is a non-residential neighbourhood and therefore the value of this indicator is the same as that of C1.4.*
C1.7 ***Total primary energy demand for building operations***	*This indicator was chosen specifically as it relates to primary energy, thus including losses in generation and transmission. This is useful as it is a measure in which energy demand for building operations may be reduced.*
C2.1 ***Share of renewable energy on-site, on total final energy consumptions for buildings operation.***	*This indicator was not chosen, as it does not relate to our case study. In Malta thermal energy is not treated separately from electrical energy when generated from renewable energy sources.*
C2.4 ***Share of renewable energy on-site, on total primary energy consumptions for buildings operation.***	*This is an important indicator to see whether the amount of energy used for building operation is coming from on-site renewables or from the grid.*
C2.7 ***Share of electric energy generation from on-site renewable sources on final electric energy./ Share of renewable energy on-site, on final electric energy consumptions.***	*Similar to above, this is an important indicator to find out whether enough energy is being generated on-site.*

D- ATMOSPHERIC EMISSIONS

CRITERION	REASON/MOTIVATION
D1.2 ***GHG emissions from energy used for all purposes in building operations.***	*The main aim of this indicator is to estimate greenhouse gas (GHG) emissions resulting from building operations in the local area. Since in Malta, energy is generated from one source (Enemalta Power Station), then the GHG emissions from energy is equal to that of the power station. This result is proportioned according to the energy used (calculated by Enemalta).*

E- NON - RENEWABLE RESOURCES

CRITERION	REASON/MOTIVATION
E1.1 ***Availability of a public municipal water supply.***	*The availability of a public water supply system, with water purity assured by appropriate purification systems and management, is essential to ensure public health in urban areas. This service is locally provided by Water Services Corporation (WSC).*
E1.4 ***Re-use of rainwater in non-residential building.***	*The rainwater collected in our test site is usually not sufficient to cater for all the irrigation demand and thus the reservoirs have to be refilled by water from private operators. This indicator is crucial to highlight the importance of re-using water when possible.*
E1.5 ***Re-use of stormwater.***	*Important to reduce the potable water consumption.*
E1.7 ***Consumption of potable water for non-residential building systems.***	*Important to reduce the potable water consumption.*
E2.1 ***Solid waste and recycling collection points.***	*Waste collection is currently being revamped in Malta. The organic bag has just recently been introduced and waste is collected everyday with a shedule for: organic waste, recycled waste and inorganic waste.*
E2.2 ***Separate collection and disposal of solid waste and recycling.***	*Waste collection is currently being revamped in Malta. The organic bag has just recently been introduced and waste is collected everyday with a shedule for: organic waste, recycled waste and inorganic waste.*
E2.3 ***Solid waste from construction and demolition projects retained in the area for re-use or recycling.***	*Construction and demolition waste is a problem in Malta especially since currently we have a construction boom. This waste is currently being disposed in quarries.*

F- ENVIRONMENT

CRITERION	REASON/MOTIVATION
F1.1 ***Impact of construction activities on natural features***	*Since locally we have a construction boom this indicator is very important.*
F1.2 ***Impact of construction activities or landscaping on soil stability or erosion.***	*Since locally we have a construction boom this indicator is very important.*
F1.3 ***Recharge of groundwater through permeable paving or landscaping.***	*Important to improve permeability locally which therefore recharges the aquifers and reduces effluents.*
F1.4 ***Changes in biodiversity.***	*To promote the diversity of plants.*
F1.7 ***Impact of local building user population on peak load capacity of public transport system.***	*Important to evaluate the peak load capacity of the local public transport system. This evaluates the efficiency of the public transport system.*
F1.8 ***Impact of private vehicles used by the local population on peak load capacity of the local road system***	*Important to determine the impact of private vehicles used by the local population on the peak load capacity of the local road system.*
F2.10 ***Ambient daytime noise conditions.***	*Important to minimise daytime noise.*
F2.11 ***Ambient night-time noise conditions.***	*Important to minimise nightime noise.*

F3.1 ***Green zones & recreation areas availability***	*Important to measure the existing green zones and recreation areas as added value for quality of life of the citizens.*
F3.2 ***Green zones & recreation areas accessibility***	*Important to reduce the negative effects of urbanization.*
F3.3 ***Green zones & recreation areas density***	*Important to measure the existing green zones and recreation areas as added value for quality of life of the citizens.*
F3.6 ***Tree coverage for shade and management of local ambient temperatures.***	*Important to reduce the ambient temperatures.*
F3.7 ***Green roofs.***	*Important to reduce the ambient temperatures and retaining rainwater which thefore reduced flooding issues.*
F3.10 ***Ecological diversity in the area***	*Important to preserve and enhance the local ecological diversity.*

G- SOCIAL ASPECTS

CRITERION	REASON/MOTIVATION
G1.1 ***Buildings that are accessible for use by physically disabled persons.***	*Important to assess the ability of local residents, workers or visitors with physical disabilities to be able to have physical access to key buildings.*
G1.2 ***Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.***	*Important to assess the ability of local residents, workers or visitors with physical disabilities to be able to make use of public outdoor facilities.*
G1.3 ***Barrier-free accessibility in local outdoor public areas.***	*Important to evaluate the accessibility of various urban resources using spatial data analysis.*
G1.4 ***Ease of access to and use of public transport for physically disabled persons.***	*Important to facilitate the acess to public transport by physically disable persons.*
G1.5 ***Objective/subjective safety measures.***	*Important to provide objective and subjective safety to area users.*
G2.1 ***Performance of the public transport service.***	*Important to determine the performance of the public transportation system.Locally the goverment is providing incentives so that the citizens favour public transport.*
G2.4 ***Quality of pedestrian and bicycle network.***	*Important to promote cycling and walking instead of the use of private car which generates traffic.*
G2.5 ***Availability of sheltered bicycle parking facilities.***	*Important to promote cycling and walking instead of the use of private car which generates traffic.*
G3.1 ***Availability of a broadband communication network***	*Important to evaluate occupant access to braodband communication.*
G3.2 ***Access to a broadband communication network.***	*Important to ensure access to high-speed internet connections.*
G4.1 ***Availability and proximity of key food and retail services***	*Important to assess the ability of the citizens to walk to key food and retail services instead of using the private car.*
G4.2 ***Availability and proximity of key public human services***	*Important to assess the ability of the citizens to key public human services instead of using the private car.*
G6.1 ***Involvement of residents in community affairs.***	*Important to promote involvement of citizens in community affairs.*

G6.3 ***Community involvement in urban planning activities***	*Important to raise the level of community involvement in planning.*
G7.1 ***Compatibility of urban design with local cultural values.***	*Important to evaluate the compatibility or urban design with the local cultural values.*
G7.2 ***Compatibility of public open space with local cultural values.***	*Important to evaluate the compatibility of public open space with local cultural values.*
G7.4 ***Use of traditional local materials and techniques***	*Important to promote the use of local materials and techniques.*
G7.5 ***Maintenance of UNESCO or other protected landscapes***	*Important to preserve and maintain landscape heritage.*
G8.2 ***Panoramic and scenic routes or view points.***	*Important to evaluate interesting natural or urban scenery.*
G8.3 ***Perceived safety of public areas for pedestrians.***	*Important to improve safety of public places and pedestrian routes.*
G8.4 ***Impact of commercial signage on the visual environment.***	*Important to avoid visual environment obstruction through the integration of commercial signage.*
G8.5 ***Impact of overhead electric distribution system on the visual environment.***	*Important to avoid visual environment obstruction caused by an overhead electric distribution system.*
G8.6 ***Perceptual quality of area development.***	*Important to improve the perception of residents about quality of the urban area.*
G8.7 ***Aesthetic quality of new facility exteriors.***	*Important to improve quality of the exteriors of new buildings.*

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	These weights were chosen specifically according to both local priorities, and the sustainable policy at the University of Malta.
B- ECONOMY	1	
C- ENERGY	2	
D- ATMOSPHERIC EMISSIONS	1	
E- NON - RENEWABLE RESOURCES	2	
F- ENVIRONMENT	2	
G- SOCIAL ASPECTS	1	

CATEGORIES WEIGHTS

Note: the categories weight results automatically from the criteria level

CATEGORIES	WEIGHT (%)
A1- Urban Structure and Form	8.6%
A2- Transportation Infrastructure	4.9%
TOTAL	13.5%
B1- Economic Structure and Value	0.9%
B2- Economic activity	0.5%
B3- Cost and Investment	0.5%
TOTAL	1.8%
C1- Non-renewable energy	10.2%
C2- Renewable and Decarbonised energy	6%
C3- Energy recycling and storage	0%
TOTAL	16.2%
D1- Atmospheric emissions	5.8%
TOTAL	5.8%
E1- Potable water, stormwater and greywater	6.5%
E2- Solid and Liquid Wastes	2.5%
E3- Resource consumption, retention and maintenance	2.8%
TOTAL	11.7%
F1- Environmental impacts	9.5%
F2- Outdoor environmental quality	9.7%
F3- Ecosystems and landscapes	9.5%
TOTAL	28.7%
G1- Safety and Accessibility	4.6%
G2- Traffic and Mobility Services	3.2%
G3- Communication services	1.8%
G4- Public and private facilities and services	1.8%

G5- Local Food	0%
G6- Management and community involvement	1.8%
G7- Society, Culture and Heritage	5.5%
G8- Perceptual	3.4%
TOTAL	**22.3%**

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						
Ax-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
A1.1 *Concentration of land parcels.*	*0.92%*	2	2	3	1	N.A
A1.2 Urban compactness	*1.85%*	3	2	4	1	N.A
A1.4 ***Residential density***	*1.85%*	3	2	4	1	N.A
A1.5 ***Urban street canyons (H/W aspect ratio)***	*1.54%*	2	2	5	1	N.A
A1.6 ***Homogeneity of Land***	*1.23%*	2	2	4	0.5	Data is not accurate.
A1.7 ***Conservation of Land***	*1.23%*	2	2	4	1	N.A
A2.2 ***Walking distance to public transport for area workers and students.***	*1.54%*	2	2	5	1.5	Encouraging the use of public transport is high on the local agenda.
A2.3 ***Extent and connectivity of pedestrian streets and walkways.***	*1.54%*	2	2	5	1.5	Encouraging the use of public transport is high on the local agenda.
A2.9 ***On-street and indoor parking spaces relative to local population.***	*1.85%*	3	4	2	1	N.A
TOTAL	13.5%					

B- ECONOMY						
Bx-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
B1.4 ***Impact of land values on adjacent areas.***	*0.92%*	2	3	2	1	N.A
B2.3 ***Employment rate***	0.46%	3	2	1	1	N.A

B3.3 **Operating energy costs for public building**	0.46%	1	2	3	1	N.A
TOTAL		1.8%				

C- ENERGY						
Cx-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
C1.1 ***Total final thermal energy consumption for building operations.***	2.77%	3	2	3	1	N.A
C1.3 ***Total final thermal energy consumption for non residential building operations.***	1.85%	**3**	**2**	**2**	1	N.A
C1.4 ***Total final electrical energy consumption for building operations.***	1.85%	**3**	**2**	**2**	1	N.A
C1.6 ***Total final electrical energy consumption for non residential building operations.***	1.85%	**3**	**2**	**2**	1	N.A
C1.7 ***Total primary energy demand for building operations***	1.85%	**3**	**2**	**2**	1	N.A
C2.1 ***Share of renewable energy on-site, on total final energy consumptions for buildings operation.***	2.77%	**3**	**2**	**3**	1	N.A
C2.4 ***Share of renewable energy on-site, on total primary energy consumptions for buildings operation.***	1.85%	**2**	**2**	**3**	1	N.A
C2.7 ***Share of electric energy generation from on-site renewable sources on final electric energy./ Share of***	1.38%	**1**	**3**	**3**	1	N.A

renewable energy on-site, on final electric energy consumptions.						
TOTAL						

D- ATHMOSPHERIC EMISSIONS						
Dx-…….						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
D1.2 ***GHG emissions from energy used for all purposes in building operations.***	5.77%	**3**	**5**	**5**	1	N.A
TOTAL	5.77%					

E- NON-RENEWABLE RESOURCES						
Ex-…….						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
E1.1 ***Availability of a public municipal water supply.***	2.77%	**3**	**2**	**3**	1	N.A
E1.4 ***Re-use of rainwater in non-residential building.***	0.62%	**1**	**2**	**2**	1	N.A
E1.5 ***Re-use of stormwater.***	*0.62%*	1	2	2	1	N.A
E1.7 ***Consumption of potable water for non-residential building systems.***	*0.62%*	1	2	2	1	N.A
E2.1 ***Solid waste & recycling collection points.***	*1.23%*	2	2	2	1	N.A
E2.2 ***Separate collection and disposal of solid waste and recycling.***	0.62%	1	2	2	1	N.A
E2.3 ***Solid waste from construction and demolition projects retained in the area for re-use or recycling.***	0.62%	1	2	2	1	N.A
TOTAL	11.7%					

F- ENVIRONMENT						
Fx-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
F1.1 ***Impact of construction activities on natural features***	1.85%	2	2	3	1	N.A
F1.2 ***Impact of construction activities or landscaping on soil stability or erosion.***	1.85%	2	2	3	1	N.A
F1.3 ***Recharge of groundwater through permeable paving or landscaping.***	0.92%	1	2	3	1	N.A
F1.4 ***Changes in biodiversity.***	1.85%	2	2	3	1	N.A
F1.7 ***Impact of local building user population on peak load capacity of public transport system.***	0.92%	2	2	3	1	N.A
F1.8 ***Impact of private vehicles used by the local population on peak load capacity of the local road system***	2.08%	3	3	3	1	N.A
F2.10 ***Ambient daytime noise conditions.***	2.77%	3	2	3	1	N.A
F2.11 ***Ambient night-time noise conditions.***	2.77%	3	2	3	1	N.A
F3.1 ***Green zones & recreation areas availability***	1.23%	2	2	2	1	N.A
F3.2 ***Green zones & recreation areas accessibility***	1.23%	2	2	2	1	N.A
F3.3 ***Green zones & recreation areas density***	1.23%	2	2	2	1	N.A
F3.6 ***Tree coverage for shade and management of local ambient temperatures.***	2.77%	3	2	3	1	N.A
F3.7 ***Green roofs.***	1.23%	2	2	2	1	N.A
F3.10 ***Ecological diversity in the area***	1.85%	2	2	3	1	N.A
TOTAL	28.7%					

G- SOCIAL ASPECTS						
Gx-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
G1.1 ***Buildings that are accessible for use by physically disabled persons.***	0.92%	**2**	**2**	**3**	1	N.A
G1.2 ***Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.***	0.92%	**2**	**2**	**3**	1	N.A
G1.3 ***Barrier-free accessibility in local outdoor public areas.***	0.92%	**2**	**2**	**3**	1	N.A

G1.4 ***Ease of access to and use of public transport for physically disabled persons.***	0.92%	2	2	3	1	N.A
G1.5 ***Objective/subjective safety measures.***	0.92%	2	2	3	1	N.A
G2.1 ***Performance of the public transport service.***	1.38%	3	2	3	1	N.A
G2.4 ***Quality of pedestrian and bicycle network.***	0.92%	2	2	3	1	N.A
G2.5 ***Availability of sheltered bicycle parking facilities.***	0.92%	2	2	3	1	N.A
G3.1 ***Availability of a broadband communication network***	0.92%	2	2	3	1	N.A
G3.2 ***Access to a broadband communication network.***	0.92%	2	2	3	1	N.A
G4.1 ***Availability and proximity of key food and retail services***	0.92%	2	2	3	1	N.A
G4.2 ***Availability and proximity of key public human services***	0.92%	2	2	3	1	N.A
G6.1 ***Involvement of residents in community affairs.***	0.62%	2	2	2	1	N.A
G6.3 ***Community involvement in urban planning activities***	1.23%	2	2	4	1	N.A
G7.1 ***Compatibility of urban design with local cultural values.***	0.92%	2	2	3	1	N.A
G7.2 ***Compatibility of public open space with local cultural values.***	0.92%	2	2	3	1	N.A
G7.4 ***Use of traditional local materials and techniques***	0.92%	2	2	3	1	N.A
G7.5 ***Maintenance of UNESCO or other protected landscapes***	1.85%	3	2	4	1	N.A
G8.2 ***Panoramic and scenic routes or view points.***	0.62%	2	2	5	1	N.A
G8.3 ***Perceived safety of public areas for pedestrians.***	0.62%	2	2	2	1	N.A
G8.4 ***Impact of commercial signage on the visual environment.***	0.62%	2	2	2	1	N.A
G8.5 ***Impact of overhead electric distribution system on the visual environment.***	0.62%	2	2	2	1	N.A
G8.6 ***Perceptual quality of area development.***	0.62%	2	2	2	1	N.A
G8.7 ***Aesthetic quality of new facility exteriors.***	0.31%	1	2	2	1	N.A
Total	22.3%					

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
A1.1 *Concentration of land parcels.*	Number of lots in the local area related to the total surface area.	*Building lots/ha*	*0: 4.2* *5: 0*	*N.A*
A1.2 Urban compactness	*Relation between the usable space of the buildings (volume) and the urban space (area).*	Ratio	*0: 1.0* *5: 3.0*	*N.A*
A1.4 ***Residential density***	*The residential density of the local area, as measured in resident persons per hectare.*	*Persons/ hectare*	*0: 50* *5: 200*	*N.A*
A1.5 ***Urban street canyons (H/W aspect ratio)***	The ratio of typical building heights acompared to the distance between building facades on the other side of the street.	*Ratio*	*0: 2.0* *5:4.0*	*N.A*
A1.6 ***Homogeneity of Land***	Percentage of the perimeter of the area directly adjacent to urbanized areas.	%	0:10% 5:36%	*N.A*
A1.7 ***Conservation of Land***	Area of undeveloped land with ecological or agricultural value / area of the neighborhood	%	0:10% 5:28%	*N.A*
A2.2 ***Walking distance to public transport for area workers and students.***	Percent of workers and students who can reach a public trasnport stop within a 500m. distance.	m	0:550 5:150	*N.A*
A2.3 ***Extent and connectivity of pedestrian streets and walkways.***	Aggregate area of pedestrian streets and walkways in the local area relative to the total land area.	%	0:10% 5:15%	*N.A*
A2.9 ***On-street and indoor parking spaces relative to local population.***	The ratio of on-street and indoor car parking spaces relative to the total resident and working population of the local area.	%	0:80% 5:25%	*N.A*

B- ECONOMY				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
B1.4 ***Impact of land values on adjacent areas.***	Average annual change in land values of properties immediately adjacent to the urban area, over a 5-year period.	%	0:3% 5:0%	*N.A*
B2.3 ***Employment rate***	*Percent of working age adults in the local area who are employed or actively looking for work.*	%	*0: 3%* *5: 0%*	*N.A*
B3.3 **Operating energy costs for public building**	*Aggregated annual operating energy cost per aggregated internal useful floor area*	*Euro/m2/year*	*0:100* *5:0*	*N.A*

C- ENERGY				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
C1.1 ***Total final thermal energy consumption for building operations.***	Aggregated annual total final thermal energy consumption per aggregated internal useful floor area	kWh/m2/yr	0: >50 5:0	*N.A*
C1.3 ***Total final thermal energy consumption for non residential building operations.***	*Urban thermal energy consumption of non-residential buildings (kWh/m2).*	kWh/m2/yr	*0: 50* *5: 10*	*N.A*
C1.4 ***Total final electrical energy consumption for building operations.***	*Aggregated annual total final electric energy consumption per aggregated internal useful floor area*	kWh/m2/yr	*0:25* *5:5.0*	*N.A*
C1.6 ***Total final electrical energy consumption for non residential building operations.***	Urban electrical energy consumption of non-residential buildings (kWh/m2).	kWh/m2	0:25 5:10	*N.A*
C1.7 ***Total primary energy demand for building operations***	Aggregated annual total primary energy consumption per aggregated internal useful floor area	kWh/m2/year	0:50 5:15	*N.A*
C2.1 ***Share of renewable energy on-site, on total final energy consumptions for***	Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy	%	0:25% 5:90%	*N.A*

buildings operation.	consumption			
C2.4 ***Share of renewable energy on-site, on total primary energy consumptions for buildings operation.***	Aggregated total annual primary energy consumption from on-site renewable energy sources / aggregated total annual primary energy consumption	%	0:30% 5:80%	*N.A*
C2.7 ***Share of electric energy generation from on-site renewable sources on final electric energy./ Share of renewable energy on-site, on final electric energy consumptions.***	Annual total electric energy consumption from on-site renewable energy sources / annual total final electric energy consumption	%	0:35% 5:75%	*N.A*

D- ATMOSPHERIC EMISSIONS				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
D1.2 ***GHG emissions from energy used for all purposes in building operations.***	CO2 equivalent emissions per useful internal floor area per year	kgCO2/m2	0:80 5:30	*N.A*

E- NON-RENEWABLE RESOURCES				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
E1.1 ***Availability of a public municipal water supply.***	Availability of a public municipal water supply to all permanent buildings in the area.	%	0:90% 5:100%	*N.A*
E1.4 ***Re-use of rainwater in non-residential building.***	*Share of rainwater collected from roofs of non residential buildings.*	%	*0: 20%* *5: 70%*	*N.A*
E1.5 ***Re-use of stormwater.***	*Percent of annual stormwater that is re-used.*	%	*0:20%* *5:50%*	*N.A*
E1.7 ***Consumption of potable water for non-residential building systems.***	Annual water consumption per occupant	m3/occupant/year	0:15 5:5.0	*N.A*
E2.1 ***Solid waste & recycling collection points.***	Proximity of the resident population to the solid waste and recycling collection point.	%	0:75% 5:95%	*N.A*
E2.2 ***Separate collection and***	Separated collection and disposal of solid	%	0:10% 5:80%	*N.A*

disposal of solid waste and recycling.	waste and recycling.			
E2.3 ***Solid waste from construction and demolition projects retained in the area for re-use or recycling.***	Volume of materials that will be re-used or recycled from the local area on the total solid waste from construction and demolition of building projects	%	0:10% 5:80%	*N.A*

F- ENVIRONMENT				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
F1.1 ***Impact of construction activities on natural features***	Preservation of land during and pre construction phase.	Score	0: Building and infrastructure construction projects have had some negative impacts on pre-existing land forms and vegetation over the previous 3-year period. 5: Building and infrastructure construction projects have had no perceptible negative impacts on pre-existing land forms and vegetation over the previous 3-year period.	*N.A*
F1.2 ***Impact of construction activities or landscaping on soil stability or erosion.***	*Impact degree of construction activities on soil stability.*	Score	*0: Building and infrastructure construction projects have had some negative impacts on landscaping and soil stability over the previous 3-year period.* *5: Building and infrastructure construction projects have had no perceptible negative impacts on landscaping and soil stability over the previous 3-year period.*	*N.A*
F1.3 ***Recharge of groundwater through permeable paving or landscaping.***	*Area of permeable surfaces on total neighborhood area*	*%*	*0:20%* *5:100%*	*N.A*
F1.4 ***Changes in biodiversity.***	Diversity of plant structures.	Score	0: Changes in plant or animal biodiversity in the local area over the last 3 year period appear to be somewhat impaired. 5: Changes in plant or animal biodiversity in the local area over the last 3 year period are positive.	*N.A*
F1.7 ***Impact of local building user population on peak load capacity of public transport system.***	Diversity of plant structures.	Local Factor	0:0.5 5:1.0	*N.A*
F1.8 ***Impact of private vehicles used by the local population on peak load capacity of the local road system***	Impact degree of private vehicles on the population.	Score	0: It is estimated that the use of private vehicles by the local population reaches the peak load capacity of the local road system, with some negative impacts on traffic speeds, air quality, pedestrian and	*N.A*

			bicycling environments, and the function of adjacent buildings. *N.A* 5: It is estimated that the use of private vehicles by the local population is considerably less than the peak load capacity of the local road system, and there are no significant impacts on traffic speeds, air quality, pedestrian and bicycling environments, and the function of adjacent buildings.	
F2.10 ***Ambient daytime noise conditions.***	Percentage of building area over noise limit.	%	0:30% 5:0%	*N.A*
F2.11 ***Ambient night-time noise conditions.***	Proportion of population exposed to non recommended levels of night noise.	%	0:20% 5:5%	*N.A*
F3.1 ***Green zones & recreation areas availability***	Availability of green zones & recreation areas	m2/resident population	0:3.0 5:10.0	*N.A*
F3.2 ***Green zones & recreation areas accessibility***	Accessibility of green spaces within the area.	Average distance,m	0:1000 5:250	*N.A*
F3.3 ***Green zones & recreation areas density***	Density of green spaces within the area.	%	0:20% 5:50%	*N.A*
F3.6 ***Tree coverage for shade and management of local ambient temperatures.***	Reduction of ambient temperatures through evapo-transpiration.	% of area	0:20% 5:80%	*N.A*
F3.7 ***Green roofs.***	Aggregate area of building roofs covered with vegetated material.	%	0:10% 5:60%	*N.A*
F3.10 ***Ecological diversity in the area***	Diversity of surface and aquatic biota in the local area.	Score	0: The level of ecological diversity in the local area is similar to the larger urban area. 5: The level of ecological diversity in the local area is considerably higherl than the larger urban area.	*N.A*

G- SOCIAL ASPECTS				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	RATIONALE
G1.1 ***Buildings that are accessible for use by physically disabled persons.***	Percent of key public, commercial and residential buildings that are accessible for use by physically disabled persons.	%	0:50% 5:90%	*N.A*

G1.2 ***Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.***	*Percent of sidewalks and other pedestrian ways that are accessible for use by physically disabled persons.*	%	*0: 50%* *5: 100%*	*N.A*
G1.3 ***Barrier-free accessibility in local outdoor public areas.***	*Adequacy of barrier-free accessible public outdoor areas compared to the total public area.*	*%*	*0:50%* *5:100%*	*N.A*
G1.4 ***Ease of access to and use of public transport for physically disabled persons.***	Features of public transport to facilitate access physically disabled persons, such as kneeling buses and wide entries..	%	0:60% 5:100%	*N.A*
G1.5 ***Objective/subjective safety measures.***	Adequacy of signage and traffic calming measures.	Score	0: A panel of residents and workers in the local area has determined that the objective and subjective measures taken to protect the safety of pedestrians, cyclists and drivers are consistent with measures taken in the urban region. 5: A panel of residents and workers in the local area has determined that the objective and subjective measures taken to protect the safety of pedestrians, cyclists and drivers are much more effective than measures taken in the urban region.	*N.A*
G2.1 ***Performance of the public transport service.***	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop	%	0:30% 5:100%	*N.A*
G2.4 ***Quality of pedestrian and bicycle network.***	Total walkway meters of dedicated pedestrian paths and meters of bicycle path per 100 inhabitants	m/100 inhabitants	0:5 5:40	*N.A*
G2.5 ***Availability of sheltered bicycle parking facilities.***	Sheltered bicycle parking spaces.	%	0:20% 5:60%	*N.A*
G3.1 ***Availability of a broadband communication network***	Local area with available broadband communication network .	%	0:80% 5:95%	*N.A*
G3.2 ***Access to a broadband communication***	Percentage of population with access to broadband	%	0:80% 5:95%	*N.A*

network.	communication.			
G4.1 ***Availability and proximity of key food and retail services***	Percent of residential buildings located within a distance of 300 m. of basic food and household goods.	%	0:30% 5:80%	*N.A*
G4.2 ***Availability and proximity of key public human services***	Percentage of inhabitants that are within 800 meters walking distance of at least 3 key services.	%	0:50% 5:100%	*N.A*
G6.1 ***Involvement of residents in community affairs.***	Percetage of resident population above 16 years having an involvement in community affairs.	%	0:5% 5:20%	*N.A*
G6.3 ***Community involvement in urban planning activities***	Level of involvement of users in urban planning	Score	0: Degrees of tokenism: Information / Consultation / Placation (in the Arnstein ladder). 5: Degrees of citizen power: Partnership, delegated power and citizen power (in the Arnstein ladder), at every stages.	*N.A*
G7.1 ***Compatibility of urban design with local cultural values.***	Compatibility with local area traditional values of street layouts and the character of urban spaces.	Score	0: Street layouts and the character of urban spaces in the local area are not compatible with traditional cultural values in the region. 5: Street layouts and the character of urban spaces in the local area are fully compatible with traditional cultural values in the region.	*N.A*
G7.2 ***Compatibility of public open space with local cultural values.***	Compatibility with local area traditional values of local public open spaces, including major uses, dimensions and adjacent uses.	Score	0: The character of public open space in the local area are not compatible with traditional cultural values in the region. 5: The character of public open spaces in the local area are fully compatible with traditional cultural values in the region.	*N.A*
G7.4 ***Use of traditional local materials and techniques***	Compatibility with local area traditional values of construction techniques and types of materials.	Score	0: The panel formed to assess the compatibility of construction techniques and types of materials now being used with traditional values in the local area considers that the level of compatibility is low. 5: The panel formed to assess the compatibility of construction techniques and types of materials now being used with traditional values in the local area considers that that the level of compatibility is high.	*N.A*
G7.5 ***Maintenance of UNESCO or other protected landscapes***	Preventive maintenance and protection of UNESCO or other protected landscapes	Score	0:Preventive maintenance and protection measures for UNESCO or other protected landscapes appear to be barely adequate.	*N.A*

			5: Preventive maintenance and protection measures for UNESCO or other protected landscapes appear to be excellent.	
G8.2 ***Panoramic and scenic routes or view points.***	Prescence and quality of scenic routes and places.	Score	There are a few scenic routes and places in the locality that provide views of interetsting natural or urban vistas.	*N.A*
G8.3 ***Perceived safety of public areas for pedestrians.***	Perceived safety of public places and pedestrian routes, as determined by a sample of pedestrians.	Score	0:The perceived safety of public places and pedestrian routes, as determined by a sample of residents, is adequate, except at night. 5: The perceived safety of public places and pedestrian routes, as determined by a sample of residents, is very high during daytime and nightime conditions.	*N.A*
G8.4 ***Impact of commercial signage on the visual environment.***	Visual impact of exterior commercial signage.	Score	0: The aggregate visual impact of exterior commercial signage, based on the degree of integration with building exteriors, diversity in signage dimensions and illumination; as determined by a sample of the local area population, is at the same level as the region. 5:The aggregate visual impact of exterior commercial signage, based on the degree of integration with building exteriors, diversity in signage dimensions and illumination; as determined by a sample of the local area population, is very positive.	*N.A*
G8.5 ***Impact of overhead electric distribution system on the visual environment.***	Visual impact of above-grade electrical distribution systems.	Score	0: The aggregate visual impact of above-grade electrical distribution systems, based on degree of visual clutter; as determined by a sample of the local area population, somewhat negative. 5: The aggregate visual impact of above-grade electrical distribution systems, based on degree of visual clutter; as determined by a sample of the local area population, is positive.	*N.A*
G8.6 ***Perceptual quality of area development.***	Perceived quality of the urban area and natural development.	Score	0:The perceived quality of area urban and natural development, as determined by a sample of residents, is negative. 5: The perceived quality of area urban and natural development, as determined by a sample of residents, is positive.	*N.A*
G8.7 ***Aesthetic quality of new facility***	Perceived quality of the exteriors of new	Score	0: The perceived quality of the exteriors of new buildings in the	*N.A*

exteriors.	buildings.		local area, as determined by a sample of residents, is mediocre. 5: The perceived quality of the exteriors of new buildings in the local area, as determined by a sample of residents, is excellent.	

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**	
A1.1 *Concentration of land parcels.*	*Number of lots in the local area related to the total surface area.*	*Information source*	University Of Malta
		Assessment method	This indicator requires two types of data: The number of building lots and the total land area of the urban area. A ratio is then attained between these two values.
		Standard	*N.A*
A1.2 Urban compactness	*Relation between the usable space of the buildings (volume) and the urban space (area).*	*Information source*	University Of Malta
		Assessment method	This indicator requires two types of data: The gross volume of buildings and the total developed area. A ratio is then attained between these two values.
		Standard	*N.A*
A1.4 ***Residential density***	*The residential density of the local area, as measured in resident persons per hectare.*	*Information source*	University Of Malta
		Assessment method	*N.A*
		Standard	*N.A*
A1.5 ***Urban street canyons (H/W aspect ratio)***	The ratio of typical building heights acompared to the distance between building facades on the other side of the street.	*Information source*	University Of Malta
		Assessment method	The main aim of this indicator is to assess the negative psychological effects that result from urban streets with a very small ratio of width to height. This requires a

			ratio between a typical building height and the distance between building facades.
		Standard	Design Policy Guidance Document (DC15)
A1.6 ***Homogeneity of Land***	Percentage of the perimeter of the area directly adjacent to urbanized areas.	*Information source*	University Of Malta
		Assessment method	The main aim of this indicator is to find the percentage ratio between the length of the urban fabric parameter adjacent to urbanised areas and the overall perimeter of the area taken.
		Standard	*N.A*
A1.7 ***Conservation of Land***	Area of undeveloped land with ecological or agricultural value / area of the neighborhood	*Information source*	University Of Malta
		Assessment method	1. Determine the surface area of the neighbourhood (including area developed for buildings). 2. Determine the aggregated surface area of land that is considered by authorities to be of ecological and agricultural value. 3. Calculate the ratio between the aggregate surface area of land that is considered by authorities to be of ecological/agricultural value and the surface area of the neighbourhood.
		Standard	*N.A*
A2.2 ***Walking distance to public transport for area workers and students.***	Percent of workers and students who can reach a public trasnport stop within a 500m. distance.	*Information source*	University Of Malta
		Assessment method	1. Identifying of the public transport stops within the test area. 2. Identifying of major education, industrial or office buildings. 3. Calculation of the walking distance for a sample of typical routes.

		Standard	*Transport National Strategy 2020*
A2.3 ***Extent and connectivity of pedestrian streets and walkways.***	Aggregate area of pedestrian streets and walkways in the local area relative to the total land area.	*Information source*	University Of Malta
		Assessment method	The main aim is to find out the percentage area of pedestrian walkways, including also those dedicated to bicycles (if any).
		Standard	*N.A*
A2.9 ***On-street and indoor parking spaces relative to local population.***	The ratio of on-street and indoor car parking spaces relative to the total resident and working population of the local area.	*Information source*	University Of Malta
		Assessment method	1. Determine the number of on-street parking spaces. 2. Determine the number of indoor parking spaces. 3. Determine the ratio of total parking spaces to the total residential and working population in the local area.
		Standard	

B- ECONOMY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
B1.4 ***Impact of land values on adjacent areas.***	Average annual change in land values of properties immediately adjacent to the urban area, over a 5-year period.	*Information source*	University Of Malta
		Assessment method	The main aim of this indicator is to assess the increase of the cost of the land with regards to the increase of cost of living. This is assessed over a 5 year period. The data for this indicator can vary due to the fact that property increase could be subjective and could vary from one property to the other.

		Standard	*N.A*
B2.3 ***Employment rate***	*Percent of working age adults in the local area who are employed or actively looking for work.*	*Information source*	https://tradingeconomics.com/malta/employment-rate
		Assessment method	The main aim of this indicator is to calculate the number of people in the labour force compared to the number of working age people and express result as a percentage. This indicator is needed to assess the labour market status, the economy development and the citizens' quality of life.
		Standard	*N.A*
B3.3 **Operating energy costs for public building**	*Aggregated annual operating energy cost per aggregated internal useful floor area*	*Information source*	
		Assessment method	
		Standard	

C- ENERGY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
C1.1 ***Total final thermal energy consumption for building operations.***	*Aggregated annual total final thermal energy consumption per aggregated internal useful floor area*	*Information source*	VRF systems monitor.
		Assessment method	• Annual Total final thermal energy consumption, in kWh/year, for each building in the area which has to be estimated by taking an average over a 3-year period • Calculation of the aggregated annual total final thermal energy consumption for all buildings. • Dividing the aggregated thermal energy consumption by the total useful area of all buildings.

		Standard	*Data Collection for 3 years.*
C1.3 ***Total final thermal energy consumption for non residential building operations.***	*Urban thermal energy consumption of non-residential buildings (kWh/m2).*	*Information source*	*Same as C1.1 as all buildings on campus are non-residential.*
		Assessment method	
		Standard	
C1.4 ***Total final electrical energy consumption for building operations.***	*Aggregated annual total final electric energy consumption per aggregated internal useful floor area*	*Information source*	*Monitored data from electricity meters.*
		Assessment method	*1. Data collection of the monitored annual total final electric energy consumption for building operations in kWh, for each building in the local area. This was taken for a 3 year period.* *2. Calculation of the aggregated annual total final electric energy consumption for all buildings.* *3. The aggregated annual total final energy was divided by the area to obtain the result.*
		Standard	*Data collection.*
C1.6 ***Total final electrical energy consumption for non residential building operations.***	Urban electrical energy consumption of non-residential buildings (kWh/m2).	*Information source*	*Same as C1.4 as all buildings on campus are non-residential.*
		Assessment method	
		Standard	
C1.7 ***Total primary energy demand for building operations***	Aggregated annual total primary energy consumption per aggregated internal useful floor area	*Information source*	*Monitored data.*
		Assessment method	1. *The annual final energy consumption was calculated in kWh/year, and summed* 2. *The aggregated annual final energy consumption was converted into primary energy consumption* 3. *The aggregated annual total primary energy consumption was divided by the aggregated internal useful area (kWh/m^2/year).*

		Standard	*Data Collection.*
C2.1 ***Share of renewable energy on-site, on total final energy consumptions for buildings operation.***	Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy consumption	*Information source*	*This indicator was not done as we do not treat thermal energy as separate from electrical energy when generated from renewable energy sources.*
		Assessment method	
		Standard	
C2.4 ***Share of renewable energy on-site, on total primary energy consumptions for buildings operation.***	Aggregated total annual primary energy consumption from on-site renewable energy sources / aggregated total annual primary energy consumption	*Information source*	*Metered Data from grid meter and renewables meter.*
		Assessment method	*The annual total primary energy consumption without renewables, was divided by the aggregated annual total primary energy consumption.*
		Standard	*N/A*
C2.7 ***Share of electric energy generation from on-site renewable sources on final electric energy./ Share of renewable energy on-site, on final electric energy consumptions.***	Annual total electric energy consumption from on-site renewable energy sources / annual total final electric energy consumption	*Information source*	*Metred Data.*
		Assessment method	*1. Collection of data of monitored annual total final electric energy consumption for building operations, in kWh, for each building, taking the average over a 3-year period.* *2. The annual total final electric energy consumption for building operations from on-site renewable energy sources is calculated.* *3. The aggregated annual total final electrical energy consumption from on-site renewable sources was divided by the aggregated annual total final electrical energy consumption.*
		Standard	*N/A*

D- ATMOSPHERIC EMISSIONS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
D1.2 ***GHG emissions from energy used for all purposes in building operations.***	CO2 equivalent emissions per useful internal floor area per year	*Information source*	*Enemalta*
		Assessment method	In Malta, energy is generated from one source (Enemalta Power Station), then the GHG emissions from energy is equal to that of the power station. This result is proportioned according to the energy used (calculated by Enemalta).
		Standard	*N/A*

E- NON-RENEWABLE RESOURCES			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
E1.1 ***Availability of a public municipal water supply.***	Availability of a public municipal water supply to all permanent buildings in the area.	*Information source*	*University Of Malta*
		Assessment method	1. Identify sections of the local area that are served by a municipal public water supply. 2. Identify residential and non-residential end users. 3. Ensure that each end user is equipped with one or more water meters. 4. Collect data on usage and assess whether water is consumed in an efficient way. 5. Place caps on consumption for various uses, and/or impose user charges to provide incentives for conservation.
		Standard	*N.A*
E1.4 ***Re-use of rainwater in non-***	*Share of rainwater collected from roofs of*	*Information source*	*University Of Malta & Team 2 Architects*

residential building.	*non residential buildings.*	*Assessment method*	The main aim of this indicator is to assess the collection of rainwater from roofs in non-residential buildings. Rainwater collection can be used as greywater to use for toilet or irrigation purposes. This reduces the demand for potable water.
		Standard	*N.A*
E1.5 ***Re-use of stormwater.***	*Percent of annual stormwater that is re-used.*	*Information source*	*University Of Malta*
		Assessment method	The main aim is to calculate the percentage of annual stormwater that is re-used in the local area
		Standard	*N.A*
E1.7 ***Consumption of potable water for non-residential building systems.***	Annual water consumption per occupant	*Information source*	*University Of Malta*
		Assessment method	This indicator calculated the amount of potable water used taking in consideration the total area of University (L/m2*yr.) The following is the method on how the result is obtained: 1. For each building the total water consumption was calculated. 2. The aggregated annual total water consumption from all non-residential buildings was calculated.
		Standard	*N.A*
E2.1 ***Solid waste & recycling collection points.***	Proximity of the resident population to the solid waste and recycling collection point.	*Information source*	*University Of Malta*
		Assessment method	Percentage of population located 50m from the waste collection points (%)
		Standard	*N.A*
E2.2 ***Separate collection and***	Separated collection and disposal of solid	*Information source*	*University Of Malta*

disposal of solid waste and recycling.	waste and recycling.	*Assessment method*	The value needed for this indicator is the percentage of recycled waste. This was determined by finding the average weight of the black bag waste (tonnes) and the average weight of the grey bag waste (tonnes). The grey bag contains waste to be recycled like plastic and paper whilst the black bag contains solid waste which would not be recycled.
		Standard	*N.A*
E2.3 ***Solid waste from construction and demolition projects retained in the area for re-use or recycling.***	Volume of materials that will be re-used or recycled from the local area on the total solid waste from construction and demolition of building projects	*Information source*	*University Of Malta*
		Assessment method	Construction activities for new buildings and for demolition have traditionally resulted in large amounts of waste materials that have to be taken to solid waste sites. Much of this material is bulky and remains, but not useable, for long periods of time. Experience has shown that significant improvements can be made in reducing waste, either by recycling them or by re-using some of these materials in new projects. For re-use applications, testing or on-site certification by structural engineers may be required.
		Standard	*N.A*

F- ENVIRONMENT			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
F1.1 ***Impact of construction activities on natural features***	Preservation of land during and pre construction phase.	*Information source*	*NSO (National Statistic Office)*
		Assessment method	This indicator assesses the degree to which construction activities over the last 5-years have had

			negative effects on natural features of the local area (minor, moderate or major). Building and infrastructure construction projects have had considerable negative impacts on pre-existing land forms and vegetation over the previous 3-year period.
		Standard	*N.A*
F1.2 ***Impact of construction activities or landscaping on soil stability or erosion.***	*Impact degree of construction activities on soil stability.*	*Information source*	*NSO (National Statistic Office)*
		Assessment method	This indicator assesses the degree to which construction activities over the last 5-years have had negative effects on landscaping and soil stability (minor, moderate or major). Building and infrastructure construction projects have had some negative impacts on landscaping and soil stability over the previous 3-year period.
		Standard	*N.A*
F1.3 ***Recharge of groundwater through permeable paving or landscaping.***	*Area of permeable surfaces on total neighborhood area*	*Information source*	*University Of Malta*
		Assessment method	To find the total percentage of water which is recharged back to the ground. This is done by assessing the different types of ground material found on the UM Campus and using a permeability coefficient factor, according to the material.
		Standard	*N.A*
F1.4 ***Changes in biodiversity.***	Diversity of plant structures.	*Information source*	*NSO (National Statistic Office)*
		Assessment method	This indicator aims to promote the diversity of plants and animal

			biodiversity.
		Standard	*N.A*
F1.7 ***Impact of local building user population on peak load capacity of public transport system.***	Diversity of plant structures.	*Information source*	https://goo.gl/P55vcP
		Assessment method	This indicator assesses how much the public transport is being used. The higher the load capacity, the more busses are being utilised. This was worked out using two methods: one method using the Peak passenger load per hour, whilst the other method using the passenger load per day.
		Standard	https://goo.gl/P55vcP
F1.8 ***Impact of private vehicles used by the local population on peak load capacity of the local road system***	Impact degree of private vehicles on the population.	*Information source*	https://www.publictransport.com.mt/
		Assessment method	To determine the impact of private vehicles used by the local population on the peak load capacity of the local road system. It is estimated that the use of private vehicles by the local population exceeds the peak load capacity of the local road system, with strongly negative impacts on traffic speeds, air quality, pedestrian and bicycling environments, and the function of adjacent buildings. The score given is therefore **-1.**
		Standard	https://www.publictransport.com.mt/
F2.10 ***Ambient daytime noise conditions.***	Percentage of building area over noise limit.	*Information source*	ERA, Noise Action Plan , 2013
		Assessment method	The proposed onset levels, for assessment of noise mitigation measures due to exposure to road

			traffic noise is: L_{den} = 65 dB
		Standard	ERA, Noise Action Plan , 2013
F2.11 ***Ambient night-time noise conditions.***	Proportion of population exposed to non recommended levels of night noise.	*Information source*	ERA, Noise Action Plan , 2013
		Assessment method	The proposed onset levels, for assessment of noise mitigation measures due to exposure to road traffic noise L_{night} = 55 dB
		Standard	ERA, Noise Action Plan , 2013
F3.1 ***Green zones & recreation areas availability***	Availability of green zones & recreation areas	*Information source*	*University Of Malta*
		Assessment method	This indicator assess how much green space there is allocated per worker/student. The units used are m^2/inhabitant.
		Standard	*N.A*
F3.2 ***Green zones & recreation areas accessibility***	Accessibility of green spaces within the area.	*Information source*	*University Of Malta*
		Assessment method	This indicator assesses the average distance to green zones and recreation area for a sample of key residential buildings. The green zones/ recreational areas at UM are close to the buildings and are scattered all throughout the area. Due to this, the score given for this indicator is the highest value (5).
		Standard	*N.A*
F3.3 ***Green zones & recreation areas density***	Density of green spaces within the area.	*Information source*	*University Of Malta*
		Assessment method	This indicator assesses the area of green spaces relative to the total land area. UM has a high number of green areas, however the benchmark seems to be too high since a percentage of 13.84% would yield a score of only 0.
		Standard	*N.A*

F3.6 ***Tree coverage for shade and management of local ambient temperatures.***	Reduction of ambient temperatures through evapo-transpiration.	*Information source*	*University Of Malta*
		Assessment method	Deciduous trees can be very effective in shielding people and lower parts of buildings from excessive solar heat gain. The area of deciduous trees relative to the total area is calculated. This indicator seems to be a repeat of indicator F3.2, since all the green areas at UM have deciduous trees.
		Standard	*N.A*
F3.7 ***Green roofs.***	Aggregate area of building roofs covered with vegetated material.	*Information source*	*University Of Malta*
		Assessment method	There is one green roof at UM, at the Faculty of the Built Environment. Having said that, the benchmarks need to be altered, since 1 green roof is better than none. It is therefore unjustifiable to give a score of -1.
		Standard	*N.A*
F3.10 ***Ecological diversity in the area***	Diversity of surface and aquatic biota in the local area.	*Information source*	*University Of Malta*
		Assessment method	The level of ecological diversity in the local area is similar to the larger urban area at UM.
		Standard	*N.A*

G- SOCIAL ASPECTS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
G1.1 ***Buildings that are accessible for use by physically disabled persons.***	Percent of key public, commercial and residential buildings that are accessible for use by physically disabled persons.	*Information source*	*University Of Malta*
		Assessment method	Almost all the buildings at university can be accessible by people with physical disabilities.

		Standard	*N.A*
G1.2 ***Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.***	*Percent of sidewalks and other pedestrian ways that are accessible for use by physically disabled persons.*	*Information source*	*University Of Malta*
		Assessment method	Key pedestrian paths were first and foremost identified. In total 13 routes were recognized, where 7 of them can be accessed by people with physical disabilities.
		Standard	*N.A*
G1.3 ***Barrier-free accessibility in local outdoor public areas.***	*Adequacy of barrier-free accessible public outdoor areas compared to the total public area.*	*Information source*	*University Of Malta*
		Assessment method	Major outdoor public areas were first and foremost identified. In total, there are 8 outdoor public spaces, where 5 of them can be easily accessed by people with physical disabilities.
		Standard	*N.A*
G1.4 ***Ease of access to and use of public transport for physically disabled persons.***	Features of public transport to facilitate access physically disabled persons, such as kneeling buses and wide entries..	*Information source*	*University Of Malta*
		Assessment method	There are 5 bus stops in the vicinity of UM. Two of them are situated at the SW to the University whilst the other 3 are situated SE next to Skatepark. All of these bus stops can be accessed by physically disabled students or workers.
		Standard	*N.A*
G1.5 ***Objective/subjective safety measures.***	Adequacy of signage and traffic calming measures.	*Information source*	*University Of Malta*
		Assessment method	By conducting interviews with students and workers it determined that the objective and subjective measures taken to protect the safety of pedestrians,

			cyclists and drivers are **more effective** than measures taken in the urban region. This would yield a score of **3**.
		Standard	*N.A*
G2.1 ***Performance of the public transport service.***	Percentage of inhabitants that are within 400 meters walking distance of at least one public transportation service stop	*Information source*	*University Of Malta*
		Assessment method	This indicator assesses the performance of the public transport service, but it asks for the percentage of the inhabitants in the area within 400 metres of walking distance to a bus stop. This doesn't make sense. The indicator should be asking about the efficiency/ inefficiency of the service of the public transport system.
		Standard	*N.A*
G2.4 ***Quality of pedestrian and bicycle network.***	Total walkway meters of dedicated pedestrian paths and meters of bicycle path per 100 inhabitants	*Information source*	*University Of Malta*
		Assessment method	
		Standard	*N.A*
G2.5 ***Availability of sheltered bicycle parking facilities.***	Sheltered bicycle parking spaces.	*Information source*	*University Of Malta*
		Assessment method	This indicator calculates the number of sheltered bicycle parking spaces relative to the total resident population of the locality. There are 8 spaces all throughout the university were bicycle parking facilities can be found. Apart from these, there are also bicycle sharing facilities.
		Standard	*N.A*
G3.1 ***Availability of a broadband communication network***	Local area with available broadband communication network .	*Information source*	*University Of Malta*
		Assessment method	Availability of a broadband

			communication service.
		Standard	*N.A*
G3.2 ***Access to a broadband communication network.***	Percentage of population with access to broadband communication.	*Information source*	*University Of Malta*
		Assessment method	Access to a broadband communication network seem to be quiet repetitive.
		Standard	*N.A*
G4.1 ***Availability and proximity of key food and retail services***	Percent of residential buildings located within a distance of 300 m. of basic food and household goods.	*Information source*	*University Of Malta*
		Assessment method	1. Estimate typical walking distances from centres of residential occupancy to key food and retail services. 2. Estimate the residential population living within 500 m. of shopping facilities and calculate the percent relative to the total residential population in the local area.
		Standard	*N.A*
G4.2 ***Availability and proximity of key public human services***	Percentage of inhabitants that are within 800 meters walking distance of at least 3 key services.	*Information source*	*University Of Malta*
		Assessment method	1. Identify locations of key services in the local area. 2. Calculate the percentage of the inhabitants that are within 800 meters walking distance from at least 3 key services. 3. Calculate the percent of residential population located within 600 m. of the 3 key human services.
		Standard	*N.A*
G6.1 ***Involvement of residents in***	Percetage of resident population above 16	*Information source*	*University Of Malta*

community affairs.	years having an involvement in community affairs.	*Assessment method*	Calculate the percentage of resident population above 16 years in age having an on-going involvement in community or school associations.
		Standard	*N.A*
G6.3 ***Community involvement in urban planning activities***	Level of involvement of users in urban planning	*Information source*	*University Of Malta*
		Assessment method	Using the Sherry Arnstein ladder on citizen participation, rate the level of users' involvement on planning. The height rungs and 3 degrees of the ladder are provided on the picture.
		Standard	*N.A*
G7.1 ***Compatibility of urban design with local cultural values.***	Compatibility with local area traditional values of street layouts and the character of urban spaces.	*Information source*	*University Of Malta*
		Assessment method	Evaluate the compatibility of street layouts and the character of urban spaces in the local area with traditional cultural values in the region.
		Standard	*N.A*
G7.2 ***Compatibility of public open space with local cultural values.***	Compatibility with local area traditional values of local public open spaces, including major uses, dimensions and adjacent uses.	*Information source*	*University Of Malta*
		Assessment method	Evaluate the compatibility with local area traditional values of local public open spaces, including major uses, dimensions and adjacent uses.
		Standard	*N.A*
G7.4 ***Use of traditional local materials and techniques***	Compatibility with local area traditional values of construction techniques and types of materials.	*Information source*	*University Of Malta*
		Assessment method	Evaluate the compatibility with local area traditional values of construction techniques and types of materials.
		Standard	*N.A*
G7.5 ***Maintenance of UNESCO or other protected landscapes***	Preventive maintenance and protection of UNESCO or other protected landscapes	*Information source*	*University Of Malta*
		Assessment	Evaluate the preventive

		method	maintenance and protection of UNESCO or other protected landscapes.
		Standard	*N.A*
G8.2 ***Panoramic and scenic routes or view points.***	Prescence and quality of scenic routes and places.	*Information source*	*University Of Malta*
		Assessment method	Calculate the presence and quality of scenic routes and places that provide views of interesting natural or urban vistas.
		Standard	*N.A*
G8.3 ***Perceived safety of public areas for pedestrians.***	Perceived safety of public places and pedestrian routes, as determined by a sample of pedestrians.	*Information source*	*University Of Malta*
		Assessment method	Evaluate the perceived safety of public places and pedestrian routes, as determined by a sample of pedestrians.
		Standard	*N.A*
G8.4 ***Impact of commercial signage on the visual environment.***	Visual impact of exterior commercial signage.	*Information source*	*University Of Malta*
		Assessment method	Aggregate visual impact of exterior commercial signage, based on degree of integration with building exteriors, diversity in signage dimensions and illumination; as determined by a sample of the local area population.
		Standard	*N.A*
G8.5 ***Impact of overhead electric distribution system on the visual environment.***	Visual impact of above-grade electrical distribution systems.	*Information source*	*University Of Malta*
		Assessment method	Aggregate visual impact of above-grade electrical distribution systems, based on degree of visual clutter; as determined by a sample of the local area population.
		Standard	*N.A*
G8.6 ***Perceptual quality of area development.***	Perceived quality of the urban area and natural development.	*Information source*	*University Of Malta*
		Assessment method	Evaluate the perceived quality of area urban and natural development, as determined by a

			sample of residents.
		Standard	*N.A*
G8.7 ***Aesthetic quality of new facility exteriors.***	Perceived quality of the exteriors of new buildings.	*Information source*	*University Of Malta*
		Assessment method	Evaluate the perceived quality of the exteriors of new buildings in the local area, as determined by a sample of residents.
		Standard	*N.A*

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	
A1.1 Concentration of land parcels.	3.6
A1.2 Urban compactness	5
A1.4 Residential density	5
A1.5 Urban street canyons (H/W aspect ratio)	0.8
A1.7 Conservation of Land	5
A2 – Transportation Infrastructure	
A2.2 Walking distance to public transport for area workers and students.	-0.6
A2.3 Extent and connectivity of pedestrian streets and walkways.	1.9
A2.9 On-street and indoor parking spaces relative to local population.	5
B – ECONOMY	
B1 - Economic Structure and Value	
B1.4 Impact of land values on adjacent areas.	0.1
B2 - Economic Activity	
B2.3 Employment rate	1.5
B3 - Cost & Investment	
B3.3 Operating energy costs for public building	
C – ENERGY	
C1 – Non-Renewable Energy	
C1.1 Total final thermal energy consumption for building operations.	3.4
C1.3 Total final thermal energy consumption for non residential building operations.	4.2
C1.4 Total final electrical energy consumption for building operations.	-1
C1.6 Total final electrical energy consumption for non residential building operations.	-1
C1.7 Total primary energy demand for building operations	-1
C2- Renewable and Decarbonized Energy	
C2.1 Share of renewable energy on-site, on total final energy consumptions for buildings operation.	
C2.4 Share of renewable energy on-site, on total primary energy consumptions for buildings operation.	5
C2.7 Share of electric energy generation from on-site renewable sources on final electric energy./ Share of renewable energy on-site, on final electric energy consumptions.	-1
D- ATMOSPHERIC EMISSIONS	
D1- Atmospheric Emissions	
D1.2 GHG emissions from energy used for all purposes in building operations.	0.4
E – NON RENEWABLE SOURCES	
E1 – Potable water, stormwater and greywater	
E1.1 Availability of a public municipal water supply.	5

E1.4 Re-use of rainwater in non-residential building.	4
E1.5 Re-use of stormwater.	-1
E1.7 Consumption of potable water for non-residential building systems.	3.5
E2 Solid & Liquid Waste	
E2.1 Solid waste & recycling collection points.	5
E2.2 Separate collection and disposal of solid waste and recycling.	0.2
E2.3 Solid waste from construction and demolition projects retained in the area for re-use or recycling.	0.1
F – ENVIRONMENT	
F1 – Environmental Impacts	
F1.1 Impact of construction activities on natural features	0
F1.2 Impact of construction activities or landscaping on soil stability or erosion.	0
F1.3 Recharge of groundwater through permeable paving or landscaping.	0.3
F1.4 Changes in biodiversity.	3
F1.7 Impact of local building user population on peak load capacity of public transport system.	0.1
F1.8 Impact of private vehicles used by the local population on peak load capacity of the local road system.	0
F2- Outdoor Environment	
F2.10 Ambient daytime noise conditions.	2.5
F2.11 Ambient night-time noise conditions.	-1
F3- Ecosystem and Landscape	
F3.1 Green zones & recreation areas availability	-0.8
F3.2 Green zones & recreation areas accessibility	5
F3.3 Green zones & recreation areas density	-1
F3.6 Tree coverage for shade and management of local ambient temperatures.	2.5
F3.7 Green roofs.	3
F3.10 Ecological diversity in the area	0
G – SOCIAL ASPECTS	
G1 – Safety and Accessibility	
G1.1 Buildings that are accessible for use by physically disabled persons.	5
G1.2 Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.	0.4
G1.3 Barrier-free accessibility in local outdoor public areas.	1.3
G1.4 Ease of access to and use of public transport for physically disabled persons.	5
G1.5 Objective/subjective safety measures.	3
G2- Traffic and Mobility Services	
G2.1 Performance of the public transport service.	2.1
G2.4 Quality of pedestrian and bicycle network.	-0.4
G2.5 Availability of sheltered bicycle parking facilities.	-1
G3- Communication Service	
G3.1 Availability of a broadband communication network.	5
G3.2 Access to a broadband communication network.	5
G4- Public and Private Facilities and services	
G4.1 Availability and proximity of key food and retail services.	5
G4.2 Availability and proximity of key public human services.	5

G6- Management and community involvement	
G6.1 Involvement of residents in community affairs.	5
G6.3 Community involvement in urban planning activities.	3
G7- Society, Culture and Heritage	
G7.1 Compatibility of urban design with local cultural values.	3
G7.2 Compatibility of public open space with local cultural values.	3
G7.4 Use of traditional local materials and techniques.	3
G7.5 Maintenance of UNESCO or other protected landscapes.	5
G8- Perceptual	
G8.2 Panoramic and scenic routes or view points.	5
G8.3 Perceived safety of public areas for pedestrians.	5
G8.4 Impact of commercial signage on the visual environment.	0
G8.5 Impact of overhead electric distribution system on the visual environment.	3
G8.6 Perceptual quality of area development.	3
G8.7 Aesthetic quality of new facility exteriors.	3

b. Key Performance Indicators value

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	%	28%
B.3.3 Running costs energy for public buildings	Aggregated annual operating energy cost per aggregated indoor useful floor area	Euro/m^2/year	18
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	16.1
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	103.2
C.1.7 Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area	kWh/m2/year	233.8
C.2.1 Share of thermal energy generation from on-site renewable sources on final thermal energy	Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy consumption	%	65%
C.2.7 Share of electric energy generation from on-site renewable sources on final electric energy	Share of renewable electric energy in final electric energy consumptions	%	16%
D.1.2 Total GHG Emissions from primary energy used in building operations	CO2 equivalent emissions per useful internal floor area per year	kg CO_2 eq./m2/yr	77
E.1.6 Consumption of potable water for residential population	Annual potable water consumption per occupant	m^3 per occupant*yr	166
E.1.7 Consumption of potable water for non-residential building systems	Annual water consumption per occupant	m^3 /m^2	8
F.1.3 Recharge of groundwater through permeable paving or landscaping	Area of permeable surfaces on total neighborhood area	%	25%
F.2.3 Ambient air quality with respect to particulates <10 mu (PM10) over a one year period	Number of days exceeding the daily limits in a year	days/year	11.5
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	%	60%
G.2.4 Quality of pedestrian and bicycle network	Total walkway meters of dedicated pedestrian paths and meters of bicycle path or “shared space” per 100 inhabitants.	m/100 inhabitants	2.3
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.	%	100%
G.6.3 Community involvement in urban planning activities	Level of involvement of users in urban planning	Level (score)	3

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
- Encourages Cross-country cooperation. - Helping sustainability by identifying weaknesses in the urban/building areas. - Holistic approach by taking into consideration not only environmental aspects but also social and economic aspects of an urban area. - …… - …… - …… - ……	- Complexity of tool. File links can be difficult to understand. - Is there really a need for two files? Makes the process more complex…. - …… - …… - …… - …… - …… - …… - ……
OPPORTUNITIES	**THREATS**
- Gathering and aggregating local benchmarks - Unified framework for the MED area and can be adaptable. - Discussions with other project partners regarding the design and planning of local areas. - The tool takes into account a number of buildings together (urban area) and not one single building. - …… - …… - …… - ……	- The tool lacks user friendliness. - If something is changed you risk loss of data and work. - Some KPIs are not relevant to Malta. The tool is not flexible enough for this change. - …… - …… - …… - …… - …… - ……

4. STRATEGIC DEFINITION

a. Performance targets

http://ec.europa.eu/environment/eir/pdf/report_mt_en.pdf

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

Environmental targets	*(1000 caracters)*
Social targets	*(1000 caracters)*
Economy targets	*(1000 caracters)*

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

A – Built Urban Systems			
Ax – Category name			
A1.1 Concentration of land parcels.		Actual value	1.11
(Indicator)	Building lots/ha	Target value	4.42
A1.2 Urban compactness		Actual value	1.73
	M3/m2	Target value	7
A1.4 Residential density		Actual value	518.52
	Pp/ha	Target value	350
A1.5 Urban street canyons (H/W aspect ratio)		Actual value	2.31
	n: building heights/ distance between building facades	Target value	1.69
A1.7 Conservation of Land		Actual value	27.94%
Total Area/ Surface area of ecological and agricultural land	%	Target value	28.50%
A2.2 Walking distance to public transport for area workers and students.		Actual value	600
	m	Target value	300
A2.3 Extent and connectivity of pedestrian streets and walkways.		Actual value	11.91
	%	Target value	10%
A2.9 On-street and indoor parking spaces relative to local population.		Actual value	11.64%
		Target value	30%
B – Economy			
Bx – Category name			
B1.4 Impact of land values on adjacent areas.		Actual value	2.91%
	%	Target value	2.91%
B2.3 Employment rate		Actual value	68.7%
	%	Target value	68.7%
B3.3 Operating energy costs for public building		Actual value	
		Target value	
C – Energy			
C1.1 Total final thermal energy consumption for building operations.		Actual value	16.10
	kWh/m2	Target value	20

C1.3 Total final thermal energy consumption for non residential building operations.		Actual value	16.10
	kWh/m2	Target value	40
C1.4 Total final electrical energy consumption for building operations.		Actual value	103.20
	kWh/m2	Target value	76
C1.6 Total final electrical energy consumption for non residential building operations.		Actual value	103.20
	kWh/m2	Target value	70
C1.7 Total primary energy demand for building operations		Actual value	233.80
	kWh/m2/yr	Target value	
C2.1 Share of renewable energy on-site, on total final energy consumptions for buildings operation.		Actual value	
	%	Target value	
C2.4 Share of renewable energy on-site, on total primary energy consumptions for buildings operation.		Actual value	93.10%
	%	Target value	80%
C2.7 Share of electric energy generation from on-site renewable sources on final electric energy./ Share of renewable energy on-site, on final electric energy consumptions.		Actual value	16.40%
	%	Target value	70%
D – Atmospheric Emissions			
D1.2 GHG emissions from energy used for all purposes in building operations.		Actual value	76.5
	kg/m2	Target value	22
E – Non-Renewable Resources			
E1.1 *Availability of a public municipal water supply.*		Actual value	100%
	%	Target value	39%
E1.4 *Re-use of rainwater in non-residential building.*		Actual value	60%
	%	Target value	60%
E1.5 *Re-use of stormwater.*		Actual value	33%
	%	Target value	0%
E1.7 *Consumption of potable water for non-residential building systems.*		Actual value	154.1
	L/m2	Target value	7.93
E2.1 *Solid waste & recycling collection points.*		Actual value	95%
	%	Target value	85%
E2.2 *Separate collection and disposal of solid waste and recycling.*		Actual value	13.06%
	%	Target value	85%
E2.3 *Solid waste from construction and demolition projects retained in the area for re-use or recycling.*		Actual value	11%
	%	Target value	65%
F – Environment			
Fx – Category name			
F1.1 Impact of construction activities on natural features		Actual value	0
	Score	Target value	4

F1.2 Impact of construction activities or landscaping on soil stability or erosion.		Actual value	0
	Score	Target value	4
F1.3 Recharge of groundwater through permeable paving or landscaping.		Actual value	25.38%
	%	Target value	50%
F1.4 Changes in biodiversity.		Actual value	3
	Score	Target value	4
F1.7 Impact of local building user population on peak load capacity of public transport system.		Actual value	0.51
	Ratio	Target value	0.7
F1.8 Impact of private vehicles used by the local population on peak load capacity of the local road system.		Actual value	0
	Score	Target value	4
F2.10 Ambient daytime noise conditions.		Actual value	20%
	%	Target value	25%
F2.11 Ambient night-time noise conditions.		Actual value	25%
	%	Target value	15%
F3.1 Green zones & recreation areas availability		Actual value	1.924
	m2/inhab	Target value	25
F3.2 Green zones & recreation areas accessibility		Actual value	250
	m	Target value	800
F3.3 Green zones & recreation areas density		Actual value	13.84%
	%	Target value	30%
F3.6 Tree coverage for shade and management of local ambient temperatures.		Actual value	13.84%
	%	Target value	50%
F3.7 Green roofs.		Actual value	1.29%
	%	Target value	40%
F3.10 Ecological diversity in the area		Actual value	0
	Score	Target value	4
G – Social			
Gx – Category name			
G1.1 Buildings that are accessible for use by physically disabled persons.		Actual value	90%
		Target value	78%
G1.2 Sidewalks and other pedestrian paths that are accessible for use by physically disabled persons.		Actual value	53.85%
		Target value	95%
G1.3 Barrier-free accessibility in local outdoor public areas.		Actual value	62.5%
		Target value	80%
G1.4 Ease of access to and use of public transport for physically disabled persons.		Actual value	100%
		Target value	80%
G1.5 Objective/subjective safety measures.		Actual value	3
		Target value	4
G2.1 Performance of the public transport service.		Actual value	60%
		Target value	70%
G2.4 Quality of pedestrian and bicycle network.		Actual value	2.30
		Target value	7
G2.5 Availability of sheltered bicycle parking facilities.		Actual value	0.53%
		Target value	80%

G3.1 Availability of a broadband communication network.		Actual value	100%
		Target value	90%
G3.2 Access to a broadband communication network.		Actual value	95%
		Target value	10%
G4.1 Availability and proximity of key food and retail services.		Actual value	80%
		Target value	80%
G4.2 Availability and proximity of key public human services.		Actual value	100%
		Target value	60%
G6.1 Involvement of residents in community affairs.		Actual value	39%
		Target value	10%
G6.3 Community involvement in urban planning activities.		Actual value	3
	Score	Target value	3
G7.1 Compatibility of urban design with local cultural values.		Actual value	3
	Score	Target value	3
G7.2 Compatibility of public open space with local cultural values.		Actual value	3
	Score	Target value	3
G7.4 Use of traditional local materials and techniques.		Actual value	3
	Score	Target value	3
G7.5 Maintenance of UNESCO or other protected landscapes.		Actual value	5
	Score	Target value	3
G8.2 Panoramic and scenic routes or view points.		Actual value	5
	Score	Target value	4
G8.3 Perceived safety of public areas for pedestrians.		Actual value	5
	Score	Target value	4
G8.4 Impact of commercial signage on the visual environment.		Actual value	0
	Score	Target value	4
G8.5 Impact of overhead electric distribution system on the visual environment.		Actual value	3
	Score	Target value	4
G8.6 Perceptual quality of area development.		Actual value	3
	Score	Target value	4
G8.7 Aesthetic quality of new facility exteriors.		Actual value	3
	Score	Target value	4

b. Constraints and restrictions

CONSTRAINTS / RESTRICTIONS	
Legal constraints	*N.A (e.g. Building Codes, Cultural Heritage Protection)*
Technical constraints	*Availability of data (energy, water etc) Energy consumption breakdown was not available for all buildings, only for buildings with modern VRF systems. Thermal energy from renewable sources was not available as they are not treated separately.*
Financial constraints	*Some information related to costs was confidential.*
Environmental condition constraints	*N.A (e.g. Climatic conditions, morphology of the district)*
Stakeholder based restrictions	*Some data could not be gathered due to restrictions from entities and authorities. Ownership. Confidentiality of data and commercial sensitivity. Energy cost data exists however it is considered to be confidential*
Other relevant constraints	*N.A*

5. DECISION MAKING

a. Description of scenarios

NAME OF SCENARIO	DESCRIPTION
1. Waste Oriented. Recycle, reuse and reduce waste campaign and implementation	A recycle, reuse and reduce waste campaign to be implemented all around campus. Certain measures to be executed like: recycling bins all around campus including all the offices, educating students and workers about reusing products instead of buying new, giving out free reusable water bottles and coffee cups to students (by finding willing sponsors to benefactor the products). Currently recycling bins can be found around campus in the public spaces and canteen area, however no recycling takes place inside the Faculty buildings.
2. Energy Oriented	The UM campus cannot be improved regarding renewable energy since all the roof space is currently already occupied by solar panels. However there is space for improvement for insulating the building envelope. Insulation boards can be installed on all external walls, internal walls and the roof. This would help to not waste energy for cooling during summer and heating during winter.
3. Water Oriented	Measures to conserve water can be easily implemented. Collection of greywater. The greywater treatment plant is to be situated at the institute of sustainable development which is being proposed as part of the extension of the university campus. The greywater will be collected from the proposed residential facilities, medical school, sustainable building complex, engineering workshops and from the existing chemistry building and biomedical science building. The treated greywater will be supplied to the existing laboratories in the Chemistry Building, Biomedical Sciences Building, and to the proposed laboratories in the Medical School and Engineering Workshop. Moreover, it will also be supplied to the proposed residential area and the sustainable living complex. Due to the fact that the University of Malta Campus may be considered as a large scale application of greywater reuses, it is being proposed to discharge the greywater sources into a common collection point, from which it is then pumped into the treatment unit. Such water then undergoes several treatment procedures in the following sequence: Aerobic Screening, Chlorination.

a. Scenarios raking

i. Performance Scores

1) Waste: Recycling all over campus (work with a percentage 20% increase for the better)

2) Minor issues regarding energy- Cannot be improved regarding renewable energy (no more space for solar panels), in terms of insulation etc can be improved
3) Conservation of water

Issues	Current state	Scenario 1	Scenario 2	Scenario..
TOTAL SCORE				
A – Built Urban Systems				
B – Economy				
C – Energy				
D – Atmospheric				
E – Non-renewable sources				
F - Environment				
G – Social aspects				

ii. Key Performance Indicators

SCENARIO A			
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	%	
B.3.3 Running costs energy for public buildings	Aggregated annual operating energy cost per aggregated indoor useful floor area	Euro/m^2/year	
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	
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	
C.1.7 Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area	kWh/m2/year	
C.2.1 Share of thermal energy generation from on-site renewable sources on final thermal energy	Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy consumption	%	
C.2.7 Share of electric energy generation from on-site renewable sources on final electric energy	Share of renewable electric energy in final electric energy consumptions	%	
D.1.2 Total GHG Emissions from primary energy used in building operations	CO2 equivalent emissions per useful internal floor area per year	kg CO_2 eq./m2/yr	
E.1.6 Consumption of potable water for residential population	Annual potable water consumption per occupant	m^3 per occupant*yr	
E.1.7 Consumption of potable water for non-residential building systems	Annual water consumption per occupant	m^3 /m^2	
F.1.3 Recharge of groundwater through	Area of permeable surfaces on	%	

permeable paving or landscaping	total neighborhood area		
F.2.3 Ambient air quality with respect to particulates <10 mu (PM10) over a one year period	Number of days exceeding the daily limits in a year	days/year	
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	%	
G.2.4 Quality of pedestrian and bicycle network	Total walkway meters of dedicated pedestrian paths and meters of bicycle path or “shared space” per 100 inhabitants.	m/100 inhabitants	
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.	%	
G.6.3 Community involvement in urban planning activities	Level of involvement of users in urban planning	Level (score)	

SCENARIO B			
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	%	
B.3.3 Running costs energy for public buildings	Aggregated annual operating energy cost per aggregated indoor useful floor area	Euro/m^2/year	
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	
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	
C.1.7 Total primary energy demand for building operations	Aggregated annual total primary energy consumption per aggregated indoor useful floor area	kWh/m2/year	
C.2.1 Share of thermal energy generation from on-site renewable sources on final thermal energy	Annual total thermal energy consumption from on-site renewable energy sources / annual total final thermal energy consumption	%	
C.2.7 Share of electric energy generation from on-site renewable sources on final electric energy	Share of renewable electric energy in final electric energy consumptions	%	
D.1.2 Total GHG Emissions from primary energy used in building operations	CO2 equivalent emissions per useful internal floor area per year	kg CO_2 eq./m2/yr	
E.1.6 Consumption of potable water for residential population	Annual potable water consumption per occupant	m^3 per occupant*yr	
E.1.7 Consumption of potable water for non-residential building systems	Annual water consumption per occupant	m^3 /m^2	
F.1.3 Recharge of groundwater through permeable paving or landscaping	Area of permeable surfaces on total neighborhood area	%	
F.2.3 Ambient air quality with respect to particulates <10 mu (PM10) over a one year period	Number of days exceeding the daily limits in a year	days/year	
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	%	
G.2.4 Quality of pedestrian and bicycle network	Total walkway meters of dedicated pedestrian paths and meters of bicycle path or “shared space” per 100 inhabitants.	m/100 inhabitants	
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.	%	
G.6.3 Community involvement in urban planning activities	Level of involvement of users in urban planning	Level (score)	

iii. Financing mechanisms evaluation

Scenario A	(1000 caracters)
Scenario B	(1000 caracters)
Scenario ….	(1000 caracters)

EU funds, local funds, schemes of government, co-financed (?)

6. RETROFIT CONCEPT

SELECTED SCENARIO	DESCRIPTION
A. (Waste)	Recycling, C&D Waste and alternative methods of excavation
B (Energy)	Neon Lights to LEDs, Passive infrared sensors all around campus, Flood Lights more energy efficient, Power factor correction units.
C (Water)	
D (Transport)	

KEY ELEMENTS OF THE CONCEPT

Retrofits Strategies	Dual Flushing
	Waste water from lab
	More educational campaigns
Performance improvement	Environment
	Society
	Economy
Financial mechanism	Aspect 1
	Aspect 2
	Aspect 3

BUILDING SCALE ASSESSMENT – BUILDING 1

1. INITIATION

General information on the selected building	
Building (Name)	
Address	*ICT Building, University Of Malta, Msida*
Building use	*Offices & Lecture Halls*
Owner	*University Of Malta*
Year of construction	*2007*
Building method	*Concrete Structure with glass*
Number of levels above earth	*3*
Number of levels underground	*1*
Heating system	*VRFs (Enter text)*
Cooling system	*VRFs (Enter text)*
DHW system	*N.A*
Ventilation system	*Electrical blowers with ducting and filters*
Lighting system	*Energy Saving Bulbs and LEDs*
Average U value	*(Number) Glass u-value? Concrete structure?*
Number of occupants	*160*
Hours of occupation per year	*2088*

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**
A1.7	*Use of vegetation to provide ambient outdoor cooling*
A1.8	*Use of native plant types*
A1.9	*Provision of public open space(s)*
A1.12	*Provision and quality of bicycle pathways and parking*
A1.13	*Provision and quality of walkways for pedestrian use*
A2	Urban Design
A2.1	*Maximizing efficiency of land use through development density*
A2.3	*Impact of orientation on the passive solar potential of building(s)*
B – ENERGY AND RESOURCES CONSUMPTION	
B1	**Total life cycle non-renewable energy**
B1.1	*Primary energy demand*
B1.2	*Delivered energy demand*
B1.3	*Delivered electric demand*
B1.4	*Energy from renewable sources in total primary energy consumption*
B1.6	*Energy from renewable sources in total electric energy consumption*
B4	***Use of potable water, stormwater and greywater***
B4.2	*Water consumption for indoor uses*

C- ENVIRONMENTAL LOADINGS	
C1	**Greenhouse Gas Emissions**
C1.3	*Global Warming Potential*
C3.2	*Solid waste from building operations*
C5.1	*Impact on access to daylight or solar energy potential of adjacent property*
C5.8	*Degree of atmospheric light pollution caused by project exterior lighting systems*

D- INDOOR ENVIRONMENTAL QUALITY	
D1	**Indoor Air Quality and Ventilation**
D1.4	*TVOC concentration in indoor air*
D1.5	*CO2 concentration in indoor air*
D2.2	*Thermal Comfort Index*

E- SERVICE QUALITY	
E1	**Safety and Security**
E1.2	*Risk to occupants and facilities from fire*
E1.3	*Risk to occupants and facilities from flooding*
E1.7	*Personal security for building users during normal operations*

E2	Functionality and Efficiency
E2.2	*Functionality of layout(s) for required functions*
E2.4	*Provision of exterior access and unloading facilities for freight or delivery*
E2.5	*Efficiency of vertical or horizontal transportation systems in building*
E2.6	*Spatial efficiency*
E2.7	*Volumetric efficiency*
E3	**Controllability**
E3.3	*Degree of local control of lighting systems*
E3.4	*Degree of personal control of techinical systems by occupants*

F- SOCIAL, CULTURAL AND PERCEPTUAL ASPECTS	
F2	**Culture and Heritage**
F2.2	*Provision of public open space compatible with local cultural values*
F2.3	*Impact of the design on existing streetscapes*
F2.4	*Use of traditional local materials and techniques*

G- COST AND ECONOMIC ASPECTS	
G1	**Cost and Economics**
G1.1	*Construction cost*
G1.4	*Use stage energy cost*
G1.6	*Investment Risk*

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**
A1.7 *Use of vegetation to provide ambient outdoor cooling*	*Since Malta is densly populated, vegetation needs to be protected more and introduced more in new projects.*
A1.8 *Use of native plant types*	*Using native plant types would reduce the need for irrigation which will safeguard water as a resource.*
A1.9 *Provision of public open space(s)*	*Since Malta is densly populated, public open spaces are something which need to be safeguarded. To provide public space for gathering, relaxation and recreation of the population within the project and neighbourhood.*
A1.12 *Provision and quality of bicycle pathways and parking*	*Important to promote cycling and walking instead of the use of private car which generates traffic.*
A1.13 *Provision and quality of walkways for pedestrian use*	*Since traffic is a number one issue, more walkways and pedestrianized streets would discourage the citizens in using their own private vehicle.*

A2.1 *Maximizing efficiency of land use through development density*	*Area in Malta is very limited with regards to the total population. This indicator is therefore vital for the conservation of space.*
A2.3 *Impact of orientation on the passive solar potential of building(s)*	*Solar Energy is the best clean energy resource for Malta, since Malta has lots of sunny days. It is the most common type of renewable energy used by the Maltese. Grants are currently being given to the citizens to encourage the installation of solar panels.*

B – ENERGY AND RESOURCES CONSUMPTION	
CRITERION	**REASON/MOTIVATION**
B1.1 *Primary energy demand*	*Important to know the primary energy requirements per year to be able to reduce them.*
B1.2 *Delivered thermal energy demand*	*The amount of energy that is being used for thermal energy is an important factor.*
B1.3 *Delivered electric demand*	*Same as in B1.2, this is a very important indicator to be able to reduce electrical energy consumption.*
B1.4 *Energy from renewable sources in total primary energy consumption*	*Renewable energy, specifically solar energy is given a high priority by the government. Grants are currently being given to the citizens to encourage the installation of solar panels.*
B1.6 *Energy from renewable sources in total electric energy consumption*	*Renewable energy, specifically solar energy is given a high priority by the government. Grants are currently being given to the citizens to encourage the installation of solar panels.*
B4 *Use of potable water, stormwater and greywater*	*Important to reduce the potable water consumption. This indicator is crucial to highlight the importance of re-using water when possible.*
B4.2 *Water consumption for indoor uses*	*Preservation of water is vital.*

C- ENVIRONMENTAL LOADINGS	
CRITERION	**REASON/MOTIVATION**
C1.3 *Global Warming Potential*	*Reduction of CO2 emissions is one the government's priorities to meet the relevant targets.*
C3.2 *Solid waste from building operations*	*Waste collection is currently being revamped in Malta. The organic bag has just recently been introduced and waste is collected everyday with a shedule for: organic waste, recycled waste and inorganic waste.*
C5.1 *Impact on access to daylight or solar energy potential of adjacent property*	*To ensure that the height, bulk or location on the site of the Design does not significantly degrade the access to direct daylight of an existing or future building on adjacent properties.*
C5.8 *Degree of atmospheric light pollution caused by*	*To minimize the spillage of light into the*

project exterior lighting systems	*atmosphere from ground-level sources.*

D- INDOOR ENVIRONMENTAL QUALITY	
CRITERION	**REASON/MOTIVATION**
D1.4 *TVOC concentration in indoor air*	*Important to assess the Total Volatile Organic Compounds concentration in the building for the health of occupants.*
D1.5 *CO2 concentration in indoor air*	*Important to assess the amount of CO2 in air to check whether enough air is being circulated.*
D2.2 *Thermal Comfort Index*	*This was done via a short questionnaire and it is important to know whether the occupants feel comfortable with the thermal setting of the environment.*

E- SERVICE QUALITY	
CRITERION	**REASON/MOTIVATION**
E1.2 *Risk to occupants and facilities from fire*	*Important to assess the risk exposure of occupants and users of the building from fire and smoke.*
E1.3 *Risk to occupants and facilities from flooding*	*Important to assess the risk to lives and property of potential flooding incidents.*
E1.7 *Personal security for building users during normal operations*	*Important to assess the extent to which building users are relatively secure in accessing and using the building.*
E2.2 *Functionality of layout(s) for required functions*	*Important to assess the appropriateness of interior layouts to functional requirements of tenancies or occupants.*
E2.4 *Provision of exterior access and unloading facilities for freight or delivery*	*Important to do an assessment of access and unloading facilities for delivery and removal of goods and waste material.*
E2.5 *Efficiency of vertical or horizontal transportation systems in building*	*To assess the service quality and functional efficiency of vertical and horizontal transportation systems within a building.*
E2.6 *Spatial efficiency*	*Important to assess the efficiency of space utilization within buildings.*
E2.7 *Volumetric efficiency*	*Important to encourage the efficient utilization of space within buildings.*
E3.3 *Degree of local control of lighting systems*	*Important to ensure that lighting control system zones in non-residential occupancies are sufficiently small to ensure a satisfactory level of occupant control over lighting conditions.*
E3.4 *Degree of personal control of techinical systems by occupants*	*Important to ensure a maximum degree of of personal control over heating, ventilation and illumination systems.*

F- SOCIAL, CULTURAL AND PERCEPTUAL ASPECTS

CRITERION	REASON/MOTIVATION
F2.2 *Provision of public open space compatible with local cultural values*	*Important to ensure that public open space compatible with local cultural values is provided in large projects.*
F2.3 *Impact of the design on existing streetscapes*	*Important to assess the degree to which the architectural design of the building exterior is harmonious relative to adjacent buildings.*
F2.4 *Use of traditional local materials and techniques*	*Important 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**
G1.1 *Construction cost*	*Important to assess the difference between the capital cost of the Design with that of a reference building designed according to standards of Acceptable Practice.*
G1.4 *Use stage energy cost*	*Important to optimize the operating cost of buildings to reflect the potential for long term performance.*
G1.6 *Investment Risk*	*Important to assess the extent to which the construction of the project has affected nearby property values and the investment risk.*

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	N.A
B – ENERGY AND RESOURCES CONSUMPTION	1	N.A
C- ENVIRONMENTAL LOADINGS	1	N.A
D- INDOOR ENVIRONMENTAL QUALITY	1	N.A
E- SERVICE QUALITY	1	N.A
F- SOCIAL CULTURAL AND PERCEPTUAL ASPECTS	1	N.A
G- COST AND ECONOMIC ASPECTS	1	N.A

CATEGORIES	WEIGHT (%)
A1- Site regeneration and Development	4.4
A2- Urban design	2.2
A3- Project Infrastructure and Services	0
TOTAL	7
B1- In use energy consumptions	29
B2- Embodied energy	0
B3- Use of materials	0
B4 – Use of water, stormwater and greywater	2.6
TOTAL	31.6
C1- Greenhouse gas emissions	11.6
C2- Other atmospheric emissions	0
C3- Solid and liquid waste	0
C4- Impact on project site	0
C5- Other local and regional impacts	10
TOTAL	23.6
D1- Indoor air quality and ventilation	1.3
D2- Thermal comfort	0.7
D3– Visual comfort	0

D4– Acoustic comfort	0
TOTAL	2
E1- Safety and Security	13.4
E2- Functionality and efficiency	2.4
E3- Controllability	0.7
E4– Flexibility and adaptability	2.2
E5- Optimization and maintenance of operating performance	1.9
TOTAL	20.7
F1- Social aspects	3.5
F2- Culture and heritage	6.4
F3- Perceptual	2.2
TOTAL	12
G1- Cost and economics	3.1
TOTAL	3.1

CRITERIA WEIGHTS

SBTool file A – WeightA-G

A- SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE						
Ax-…….						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
A1.7 *Use of vegetation to provide ambient outdoor cooling*	**0.87**	**3**	**2**	**2**	**3**	N.A
A1.8 *Use of native plant types*	**1.31**	**3**	**2**	**3**	**3**	N.A
A1.9 *Provision of public open space(s)*	**0.44**	**3**	**1**	**2**	**3**	N.A
A1.12 *Provision and quality of bicycle pathways and parking*	**0.87**	**3**	**2**	**2**	**3**	N.A
A1.13 *Provision and quality of walkways for pedestrian use*	**0.87**	**3**	**2**	**2**	**3**	N.A
A2.3 *Impact of orientation on the passive solar potential of building(s)*	**2.19**	**5**	**3**	**4**	**3**	N.A

B- ENERGY AND RESOURCES CONSUMPTION						
Bx-…….						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
B1.1 *Primary energy demand*	**0**	**5**	**2**	**4**	**3**	N.A
B1.2 *Delivered energy demand*	**7.29**	**5**	**2**	**4**	**3**	N.A
B1.3 *Delivered electric demand*	**7.29**	**5**	**2**	**4**	**3**	N.A

B1.4 *Energy from renewable sources in total primary energy consumption*	**7.29**	**5**	**2**	**4**	**3**	N.A
B1.6 *Energy from renewable sources in total electric energy consumption*	**7.29**	**5**	**2**	**4**	**3**	N.A
B4.2 *Water consumption for indoor uses*	**2.62**	**3**	**2**	**3**	**3**	N.A

C- ENVIRONMENTAL LOADINGS						
Cx-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
C1.3 *Global Warming Potential*	**13.66**	**5**	**3**	**5**	**3**	N.A
C3.2 *Solid waste from building operations*	**0**	**3**	**2**	**3**	**3**	N.A
C5.1 *Impact on access to daylight or solar energy potential of adjacent property*	**6.56**	**5**	**3**	**4**	**3**	N.A
C5.8 *Degree of atmospheric light pollution caused by project exterior lighting systems*	**3.50**	**3**	**2**	**4**	**3**	N.A

D- INDOOR ENVIRONMENTAL QUALITY						
Dx-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
D1.4 *TVOC concentration in indoor air*	**0.66**	**3**	**3**	**2**	**3**	N.A
D1.5 *CO2 concentration in indoor air*	**0.66**	**3**	**3**	**2**	**3**	N.A
D2.2 *Thermal Comfort Index*	**0.66**	**3**	**3**	**2**	**3**	N.A

E- SERVICE QUALITY						
Ex-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
E1.2 *Risk to occupants and facilities from fire*	**2.54%**	**3**	**3**	**3**	**3**	N.A

E1.3 *Risk to occupants and facilities from flooding*	**3.39**	**4**	**3**	**3**	**3**	N.A
E1.7 *Personal security for building users during normal operations*	**2.12**	**5**	**3**	**3**	**3**	N.A
E2.2 *Functionality of layout(s) for required functions*	**0.28**	**3**	**2**	**1**	**3**	N.A
E2.4 *Provision of exterior access and unloading facilities for freight or delivery*	**0.14**	**3**	**1**	**1**	**3**	N.A
E2.5 *Efficiency of vertical or horizontal transportation systems in building*	**1.69**	**3**	**3**	**4**	**3**	N.A
E2.6 *Spatial efficiency*	**0.28**	**3**	**2**	**1**	**3**	N.A
E2.7 *Volumetric efficiency*	**0.28**	**3**	**2**	**1**	**3**	N.A
E3.3 *Degree of local control of lighting systems*	**0.19**	**2**	**2**	**1**	**3**	N.A
E3.4 *Degree of personal control of techinical systems by occupants*	**0.38**	**2**	**2**	**2**	**3**	N.A

F- SOCIAL CULTURAL AND PERCEPTUAL ASPECTS						
Fx-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
F2.2 *Provision of public open space compatible with local cultural values*	**1.13**	**3**	**2**	**2**	**3**	N.A
F2.3 *Impact of the design on existing streetscapes*	**1.13**	**3**	**2**	**2**	**3**	N.A
F2.4 *Use of traditional local materials and techniques*	**1.13**	**3**	**2**	**2**	**3**	N.A

G- COST AND ECONOMIC ASPECTS						
Gx-……						
CRITERION	**Weight (%)**	**B**	**C**	**D**	**L.F.**	**L.F. REASON/MOTIVATION**
G1.1 *Construction cost*	**0.85**	**3**	**3**	**1**	**3**	N.A
G1.4 *Use stage energy cost*	**0.85**	**3**	**3**	**1**	**3**	N.A
G1.6 *Investment Risk*	**0.38**	**3**	**3**	**1**	**3**	N.A

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
A1.7 *Use of vegetation to provide ambient outdoor cooling*	Ratio of total vegetated surface area (on ground and on roofs, and including trees), divided by total site area. The result is known as or Leaf Area Index.	*Ratio*	*0: 0.4*	*N.A*
			5: 1.0	*N.A*
A1.8 *Use of native plant types*	The percentage of landscaped area (excluding paved areas) planted with native species.	*%*	*0:40%*	*N.A*
			5:100%	*N.A*
A1.9 *Provision of public open space(s)*	To provide public space for gathering, relaxation and recreation of the population within the project and neighbourhood. (Score)	Score	*0*	*N.A*
			5	*N.A*
A1.12 *Provision and quality of bicycle pathways and parking*	Underground Sheltered bicycle path- 12 spaces + showers	Score	*0*	*N.A*
			5	*N.A*
A1.13 *Provision and quality of walkways for pedestrian use*	To assess the extent and quality of walkways for occupants and users. Pedestrian walkways shaded by trees, bridges connecting to building, parking spaces leading directly to the building	Score	*0*	*N.A*
			5	*N.A*
A2.3 *Impact of orientation on the passive solar potential of building(s)*	Deviation, in degrees (º) of main building axis from East-West (to ensure a maximum possible insolation).	Score	*0*	*N.A*
			5	*N.A*

B- ENERGY AND RESOURCES CONSUMPTION				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
B1.1 *Primary energy demand*		%	*0: value*	*N.A*
			5: value	*N.A*
B1.2 *Delivered energy demand*			*0:*	*N.A*
			5:	*N.A*
B1.3 *Delivered electric demand*			*0:*	*N.A*
			5:	*N.A*
B1.4 *Energy from renewable sources in total primary energy consumption*			*0:*	*N.A*
			5:	*N.A*
B1.6 *Energy from renewable sources in total electric energy consumption*			*0:*	*N.A*
			5:	*N.A*
B4.2 *Water consumption for indoor uses*			*0:*	*N.A*
			5:	*N.A*

C- ENVIRONMENTAL LOADINGS				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
C1.3 *Global Warming Potential*	*CO_2 equivalent emissions per internal useful floor area per year*	%	*0: value*	*N.A*
			5: value	*N.A*
C3.2 *Solid waste from building operations*	*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:*	*N.A*
			5:	*N.A*
C5.1 *Impact on access to daylight or solar energy potential of adjacent property*	*Percentage of nearest face of an existing building, or a future building designed on an adjacent site in accordance with existing regulations that will be shaded by the subject building.*	%	*0:*	*N.A*
			5:	*N.A*
C5.8 *Degree of atmospheric light pollution caused by project exterior lighting systems*	*Percentage of total exterior light output that lies outside a vertical 120 degree cone, as indicated by drawings and specifications.*	%	*0:*	*N.A*
			5:	*N.A*

D- INDOOR ENVIRONMENTAL QUALITY				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
D1.4 *TVOC concentration in indoor air*	*TVOC concentration in indoor air*	*%*	*0: value*	*N.A*
			5: value	*N.A*
D1.5 *CO2 concentration in indoor air*	*Designs for HVAC systems that conform to ASHRAE, CIBSE or other acceptable protocol during design phase; actual monitoring results during operations phase.*		*0:*	*N.A*
			5:	*N.A*
D2.2 *Thermal Comfort Index*			*0:*	*N.A*
			5:	*N.A*

E- SERVICE QUALITY				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
E1.2 *Risk to occupants and facilities from fire*	*Risk level for occupants in the most vulnerable part of the building.*	*Score*	*0*	*N.A*
			5	*N.A*
E1.3 *Risk to occupants and facilities from flooding*	*Probability of injury or death or major property damage in case of 100-year flood event or other foreseeable flood risk.*	*Score*	*0*	*N.A*
			5	*N.A*
E1.7 *Personal security for building users during normal operations*	*Measures that are likely to assure adequate levels of actual and perceived personal security, according to design documentation.*	*Score*	*0*	*N.A*
			5	*N.A*
E2.2 *Functionality of layout(s) for required functions*	*Goodness of fit of provided layouts (shape, ease of access) with functional requirements.*	*Score*	*0*	*N.A*
			5	*N.A*
E2.4 *Provision of exterior access and unloading facilities for freight or delivery*	*Adequacy of the facility unloading and temporary storage capacity and measures to prevent excessive noise and visual pollution from disturbing occupants.*	*Score*	*0*	*N.A*
			5	*N.A*
E2.5 *Efficiency of*	*Availability of lifts for*	*Score*	*0:*	*N.A*

vertical or horizontal transportation systems in building	*occupant use, taking into account down-time for service and moving needs, and the time required to travel from the ground floor to the top floor (or vice versa) during peak periods; provision, capacity and speed of horizontal passenger conveying systems.*		*5:*	*N.A*
E2.6 *Spatial efficiency*	*The ratio of directly functional net areas to total net area in each occupancy. Total Net Areas exclude only structure and building envelope areas; Net Functional Areas (NFA) exclude interior garages, vertical circulation and building mechanical rooms.*	*%*	*0:60%*	*N.A*
			5:90%	*N.A*
E2.7 *Volumetric efficiency*	*The ratio of directly functional net areas to total net area in each occupancy. Total Net Areas exclude only structure and building envelope areas; Net Functional Areas (NFA) exclude interior garages, vertical circulation and building mechanical rooms.*	*%*	*0:60%*	*N.A*
			5:90%	*N.A*
E3.3 *Degree of local control of lighting systems*	*The area of typical lighting control zones in perimeter areas in m2, as shown in design documentation.*	*Score*	*0*	*N.A*
			5	*N.A*
E3.4 *Degree of personal control of techinical systems by occupants*	*The degree of control over key indoor environment systems that can be exercised by occupants, according to design documentation.*	*Score*	*0*	*N.A*
			5	*N.A*

F- SOCIAL CULTURAL AND PERCEPTUAL ASPECTS				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
F2.2 *Provision of public open space compatible with local cultural values*	*Expert assessment of the degree to which public open space provided in the project is consistent with local cultural values.*	*%*	*0: value*	*N.A*
			5: value	*N.A*
F2.3 *Impact of the design on existing streetscapes*	*Expert assessment of the harmony of the Design with adjacent existing buildings, in features such as height, bulk, set-back from the street, window size and height, colour or type of materials.*	*Score*	*0*	*N.A*
			5	*N.A*
F2.4 *Use of traditional local materials and techniques*	*Architect's estimate of the percent of the non-structural elements of the building will be constructed using traditional local materials and construction techniques.*	*%*	*0:*	*N.A*
			5:	*N.A*

G- COST AND ECONOMIC ASPECTS				
CRITERION	INDICATOR	UNIT OF MEASURE	BENCHMARK	DERIVATIONS
G1.1 *Construction cost*	*Predicted construction cost per unit area, according to design documentation.*	*%*	*0: value*	*N.A*
			5: value	*N.A*
G1.4 *Use stage energy cost*	*Energy annual cost per usable floor area*	*E/m^2*	*0:*	*N.A*
			5:	*N.A*
G1.6 *Investment Risk* **Etc.**	*Percent change in market value of properties within 200 m of the project boundaries, 12 months after the start of construction.*	*Score*	*0*	*N.A*
			5	*N.A*

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**	
A1.7 *Use of vegetation to provide ambient outdoor cooling*	Ratio of total vegetated surface area (on ground and on roofs, and including trees), divided by total site area. The result is known as or Leaf Area Index.	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
A1.8 *Use of native plant types*	The percentage of landscaped area (excluding paved areas) planted with native species.	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
A1.9 *Provision of public open space(s)*	To provide public space for gathering, relaxation and recreation of the population within the project and neighbourhood. (Score)	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
A1.12 *Provision and quality of bicycle pathways and parking*	Underground Sheltered bicycle path- 12 spaces + showers	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*

A1.13 *Provision and quality of walkways for pedestrian use*	To assess the extent and quality of walkways for occupants and users. Pedestrian walkways shaded by trees, bridges connecting to building, parking spaces leading directly to the building	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
A2.3 *Impact of orientation on the passive solar potential of building(s)*	Deviation, in degrees (º) of main building axis from East-West (to ensure a maximum possible insolation).	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*

B- ENERGY AND RESOURCES CONSUMPTION			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
B1.1 *Primary energy demand*		*Information source*	*Measured data from meters.*
		Assessment method	*Insert text here*
		Standard	*Insert text here*
B1.2 *Delivered thermal energy demand*		*Information source*	*Measured data from VRF meters.*
		Assessment method	
		Standard	
B1.3 *Delivered electric demand*		*Information source*	*Measured data from meters.*
		Assessment method	
		Standard	

B1.4 *Energy from renewable sources in total primary energy consumption*		*Information source*	
		Assessment method	
		Standard	
B1.6 *Energy from renewable sources in total electric energy consumption*		*Information source*	
		Assessment method	
		Standard	
B4.2 *Water consumption for indoor uses*		*Information source*	
		Assessment method	
		Standard	

C- ENVIRONMENTAL LOADINGS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
C1.3 *Global Warming Potential*	*CO_2 equivalent emissions per internal useful floor area per year*	*Information source*	*Enemalta*
		Assessment method	*Insert text here*
		Standard	*Insert text here*
C3.2 *Solid waste from building operations*	*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*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
C5.1 *Impact on access to daylight or solar energy potential of*	*Percentage of nearest face of an existing*	*Information source*	*Plans of building*

adjacent property	*building, or a future building designed on an adjacent site in accordance with existing regulations that will be shaded by the subject building.*	*Assessment method*	*Desk Analysis*
		Standard	*N.A*
C5.8 *Degree of atmospheric light pollution caused by project exterior lighting systems*	*Percentage of total exterior light output that lies outside a vertical 120 degree cone, as indicated by drawings and specifications. CO_2 equivalent emissions per internal useful floor area per year*	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*

D- INDOOR ENVIRONMENTAL QUALITY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
D1.4 *TVOC concentration in indoor air*	*TVOC concentration in indoor air*	*Information source*	*Measured Data*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
D1.5 *CO_2 concentration in indoor air*	*Designs for HVAC systems that conform to ASHRAE, CIBSE or other acceptable protocol during design phase; actual monitoring results during operations phase.*	*Information source*	*Measured Data*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
D2.2 *Thermal Comfort Index*		*Information source*	*Questionnaire*
		Assessment method	*Short Questionnaire was distributed among occupants of the building.*
		Standard	*N.A*

E- SERVICE QUALITY			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
E1.2 *Risk to occupants and facilities from fire*	*Risk level for occupants in the most vulnerable part of the building.*	*Information source*	*Fire Assessment Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
E1.3 *Risk to occupants and facilities from flooding*	*Probability of injury or death or major property damage in case of 100-year flood event or other foreseeable flood risk.*	*Information source*	*Water Assessment Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
E1.7 *Personal security for building users during normal operations*	*Measures that are likely to assure adequate levels of actual and perceived personal security, according to design documentation.*	*Information source*	*Health and safety plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
E2.2 *Functionality of layout(s) for required functions*	*Goodness of fit of provided layouts (shape, ease of access) with functional requirements.*	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
E2.4 *Provision of exterior access and unloading facilities for freight or delivery*	*Adequacy of the facility unloading and temporary storage capacity and measures to prevent excessive noise and visual pollution from disturbing occupants.*	*Information source*	*Plans of building*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
E2.5 *Efficiency of vertical or horizontal transportation systems*	*Availability of lifts for occupant use, taking*	*Information source*	*Lift data*

in building	*into account down-time for service and moving needs, and the time required to travel from the ground floor to the top floor (or vice versa) during peak periods; provision, capacity and speed of horizontal passenger conveying systems.*	*Assessment method*	*Desk Analysis*
		Standard	*N.A*
E2.6 *Spatial efficiency*	*The ratio of directly functional net areas to total net area in each occupancy.*	*Information source*	*Building Plans*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
E2.7 *Volumetric efficiency*	*Total Net Areas exclude only structure and building envelope areas; Net Functional Areas (NFA) exclude interior garages, vertical circulation and building mechanical rooms. The ratio of directly functional net areas to total net area in each occupancy.*	*Information source*	*Building Plans*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
E3.3 *Degree of local control of lighting systems*	*The area of typical lighting control zones in perimeter areas in m2, as shown in design documentation.*	*Information source*	*Building Plans*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
E3.4 *Degree of personal control of techinical systems by occupants*	*The degree of control over key indoor environment systems that can be exercised by occupants, according to design documentation.*	*Information source*	*Building Plans*
		Assessment method	*Desk Analysis*
		Standard	*N.A*

F- SOCIAL CULTURAL AND PERCEPTUAL ASPECTS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
F2.2 *Provision of public open space compatible with local cultural values*	*Expert assessment of the degree to which public open space provided in the project is consistent with local cultural values.*	*Information source*	*Building Plans*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
F2.3 *Impact of the design on existing streetscapes*	*Expert assessment of the harmony of the Design with adjacent existing buildings, in features such as height, bulk, set-back from the street, window size and height, colour or type of materials.*	*Information source*	*Building Plans*
		Assessment method	*Desk Analysis*
		Standard	*N.A*
F2.4 *Use of traditional local materials and techniques*	*Architect's estimate of the percent of the non-structural elements of the building will be constructed using traditional local materials and construction techniques.*	*Information source*	*Building Plans*
		Assessment method	*Desk Analysis*
		Standard	*N.A*

G- COST AND ECONOMIC ASPECTS			
CRITERION	**INDICATOR**	**SPECIFICATIONS**	
G1.1 *Construction cost*	*Predicted construction cost per unit area, according to design documentation.*	*Information source*	*Design documentation*
		Assessment method	*Desk analysis*
		Standard	*N.A*
G1.4 *Use stage energy cost*	*Energy annual cost per usable floor area*	*Information source*	*Design documentation*
		Assessment method	*Desk analysis*
		Standard	*N.A*

G1.6 *Investment Risk*	*Percent change in market value of properties within 200 m of the project boundaries, 12 months after the start of construction.*	*Information source*	*Property market studies*
		Assessment method	*Desk analysis*
		Standard	*N.A*

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
A - SITE REGENERATION AND DEVELOPMENT, URBAN DESIGN AND INFRASTRUCTURE	
A1.7 Use of vegetation to provide ambient outdoor cooling	1.1
A1.8 Use of native plant types	1.1
A1.9 Provision of public open space(s)	4
A1.12 Provision and quality of bicycle pathways and parking	4
A1.13 Provision and quality of walkways for pedestrian use	5
A2.3 Impact of orientation on the passive solar potential of building(s)	4
B – ENERGY AND RESOURCES CONSUMPTION	
B1.1 Primary energy demand	4
B1.2 Delivered energy demand	5
B1.3 Delivered electric demand	5
B1.4 Energy from renewable sources in total primary energy consumption	
B1.6 Energy from renewable sources in total electric energy consumption	-1
B4.2 Water consumption for indoor uses	5
C- ENVIRONMENTAL LOADINGS	
C1.3 Global Warming Potential	-0.3
C5.1 Impact on access to daylight or solar energy potential of adjacent property	5
C5.8 Degree of atmospheric light pollution caused by project exterior lighting systems	4
D- INDOOR ENVIRONMENTAL QUALITY	
D1.4 TVOC concentration in indoor air	3
D1.5 CO_2 concentration in indoor air	5
E- SERVICE QUALITY	
E1.2 Risk to occupants and facilities from fire	
E1.3 Risk to occupants and facilities from flooding	
E1.7 Personal security for building users during normal operations	
E2.2 Functionality of layout(s) for required functions	
E2.4 Provision of exterior access and unloading facilities for freight or delivery	
E2.5 Efficiency of vertical or horizontal transportation systems in building	
E2.6 Spatial efficiency	
E2.7 Volumetric efficiency	
E3.3 Degree of local control of lighting systems	
E3.4 Degree of personal control of techinical systems by occupants	
F- SOCIAL CULTURAL AND PERCEPTUAL ASPECTS	
F2.2 Provision of public open space compatible with local cultural values	
F2.3 Impact of the design on existing streetscapes	
F2.4 Use of traditional local materials and techniques	
G- COST AND ECONOMIC ASPECTS	
G1.1 Construction cost	

G1.4 Use stage energy cost	
G1.6 Investment Risk	

b. Key Performance Indicators value

KPI	Indicator	Unit of measure	Value
B.1.1 Primary energy demand	Primary energy demand per internal useful floor area per year	kWh/m2/yr	133.91
B.1.2 Delivered thermal energy demand	Delivered thermal energy demand per internal useful floor area per year	kWh/m2/yr	14.68
B.1.3 Delivered electric energy demand	Delivered electric energy demand per internal useful floor area per year	kWh/m2/yr	63.54
B.1.5 Energy from renewable sources in total final thermal energy consumption	Share of renewable energy in final thermal energy consumptions	%	/
B.1.6 Energy from renewable sources in total final electric energy consumption	Share of renewable energy in final electric energy consumption	%	25.20%
B.1.11 Embodied non-renewable primary energy	Embodied primary non-renewable energy	MJ/m^2	/
B.3.5 Recycled materials	Weight of recycled materials on total weight of materials	%	/
B.4.5 Potable water consumption for indoor uses	Potable water consumption per occupant per year	m^3/occupant/year	/
C.1.3 Global Warming potential	CO_2 equivalent emissions per internal useful floor area per year	kg CO_2 eq./m^2/yr	41.2
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	/
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	%	/
D.1.4 TVOC concentration in indoor air	TVOC concentration in indoor air	µg/ m^3	1474.4ppm
D.1.10 Ventilation rate	Ventilation rate normalized per useful floor area	l/s/m2	/
D.2.2 Thermal comfort index	Predicted Percentage Dissatisfied (PPD)	%	/

G.1.4 Use stage energy cost	Energy annual cost per usable floor area	€/m2/yr	/
G.1.5 Use stage water cost	Water annual cost per usable floor area	€/m2/yr	/

c. Actual performance analysis

WEAKNESSES ASPECTS	- Complexity of tool. File links can be difficult to understand. - Is there really a need for two files? Makes the process more complex. - B1.2 delivered energy demand indicator units need to be re-arranged in the tool.
STRENGHT ASPECTS	- Encourages Cross-country cooperation. - Helping sustainability by identifying weaknesses in the urban/building areas. - Holistic approach by taking into consideration not only environmental aspects but also social and economic aspects of an urban area.
POTENTIAL FOR PERFORMANCE IMPROVEMENT	- Gathering and aggregating local benchmarks - Unified framework for the MED area and can be adaptable. - Discussions with other project partners regarding the design and planning of local areas. - The tool takes into account a number of buildings together (urban area) and not one single building.

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			
Ax – Category name			
A1.7 Use of vegetation to provide ambient outdoor cooling		Actual value	0.53
Ratio of total vegetated surface area (on ground and on roofs, and including trees), divided by total site area. The result is known as or Leaf Area Index.	Leaf Area Index (LAI)	Target value	1.0
A1.8 Use of native plant types		Actual value	53%
The extent of vegetated landscaped area that is planted with native plants.	%	Target value	76%
A1.9 Provision of public open space(s)		Actual value	4
The provision of land within the site suitable as public open space because of its location, area or other characteristics.	Score	Target value	4
A1.12 Provision and quality of bicycle pathways and parking		Actual value	4
Type and extent of bicycle paths in the project, connectivity with off-site bicycle paths, amount of sheltered and unsheltered bicycle parking, location of bicycle parking facilities relative to building entrances.	Score	Target value	4
A1.13 Provision and quality of walkways for pedestrian use		Actual value	4
Type and extent of walkways in the project, extent of walkways sheltered from rain, snow or excess sunshine.	Score	Target value	4
A2.3 Impact of orientation on the passive solar potential of building(s)		Actual value	4
Deviation, in degrees (º) of main building axis from East-West (to ensure a maximum possible insolation)..	Score	Target value	4
B – ENERGY AND RESOURCES CONSUMPTION			
B1.1 Primary energy demand		Actual value	133.91
Primary energy demand per internal useful floor area per year	kWh/sq mt	Target value	
B1.2 Delivered energy demand		Actual value	14.68
Delivered thermal energy demand per internal useful floor area per	kWh/sq mt	Target value	

year			
B1.3 Delivered electric demand		Actual value	63.54
Delivered electric energy demand per internal useful floor area per year	kWh/sq mt	Target value	
B1.4 Energy from renewable sources in total primary energy consumption		Actual value	12.40%
The predicted or actual proportion of the total primary energy consumption of the building that is met by renewable energy during the operating phase, expressed as a percent of the annual total.	%	Target value	
B1.6 Energy from renewable sources in total electric energy consumption		Actual value	25.20%
Share of renewable energy in final electric energy consumption	%	Target value	
B4.2 Water consumption for indoor uses		Actual value	540
Estimates made during the design phase focus on use of water-efficient sanitary fixtures equipment, to predict the gross water volume needed; and also plans for the use of stored rainwater or recycled (grey) water, to estimate what the net water consumption may be.	m^3/year	Target value	
C- ENVIRONMENTAL LOADINGS			
C1.3 Global Warming Potential		Actual value	41.20
CO2 equivalent emissions per internal useful floor area per year	kgCO2/sq mt.	Target value	30
C5.1 Impact on access to daylight or solar energy potential of adjacent property		Actual value	0%
Percentage of nearest face of an existing building, or a future building designed on an adjacent site in accordance with existing regulations that will be shaded by the subject building.	%	Target value	14%
C5.8 Degree of atmospheric light pollution caused by project exterior lighting systems		Actual value	5%
Percentage of total exterior light output that lies outside a vertical 120 degree cone, as indicated by drawings and specifications.	%	Target value	10%
D- INDOOR ENVIRONMENTAL QUALITY			
D1.4 TVOC concentration in indoor air		Actual value	1474.4ppm
	ppm	Target value	
D1.5 CO_2 concentration in indoor air		Actual value	447.8ppm
	ppm	Target value	
E- SERVICE QUALITY			
E1.2 Risk to occupants and facilities from fire		Actual value	3.5
	Score	Target value	3

E1.3 Risk to occupants and facilities from flooding		Actual value	4
	Score	Target value	3
E1.7 Personal security for building users during normal operations		Actual value	5
	Score	Target value	3
E2.2 Functionality of layout(s) for required functions		Actual value	4
	Score	Target value	3
E2.4 Provision of exterior access and unloading facilities for freight or delivery		Actual value	5
	Score	Target value	3
E2.5 Efficiency of vertical or horizontal transportation systems in building		Actual value	4
	Score	Target value	3
E2.6 Spatial efficiency		Actual value	61.82%
	%	Target value	60%
E2.7 Volumetric efficiency		Actual value	56.57%
	%	Target value	70%
E3.3 Degree of local control of lighting systems		Actual value	4
	Score	Target value	3
E3.4 Degree of personal control of techinical systems by occupants		Actual value	2.5
	Score	Target value	2
F- SOCIAL CULTURAL AND PERCEPTUAL ASPECTS			
F2.2 Provision of public open space compatible with local cultural values		Actual value	2
	Score	Target value	2
F2.3 Impact of the design on existing streetscapes		Actual value	0
	Score	Target value	2
F2.4 Use of traditional local materials and techniques		Actual value	10%
	%	Target value	50%
G- COST AND ECONOMIC ASPECTS			
G1.1 Construction cost		Actual value	
	Score	Target value	
G1.4 Use stage energy cost		Actual value	
	Score	Target value	
G1.6 Investment Risk		Actual value	4
	Score	Target value	

b. Constraints and restrictions

CONSTRAINTS / RESTRICTIONS	
Legal constraints	*N.A (e.g. Building Codes, Cultural Heritage Protection)*
Technical constraints	*Availability of data (energy, water etc). Energy consumption breakdown was not available. Thermal energy from renewable sources was not available.*
Financial constraints	*Some investment costs and ROI information is not available due to commercial sensitivity.*

Environmental condition constraints	*N.A (e.g. Climatic conditions, morphology of the district)*
Stakeholder based restrictions	*Some data could not be gathered due to restrictions from entities and authorities. Ownership. Confidentiality of data and commercial sensitivity. Energy cost data exists however it is considered to be confidential.*
Other relevant constraints	*N.A*

c. Potential strategies at building scale

Synergy zones	
Energetic synergies	*N.A (e.g. Energy surplus delivering)*
Water synergies	*Potential rainwater collection and re-use of water for irrigation. Potential re-use of backwater- Installation of a filtering system and re-using the water for flushing etc.*
Waste synergies	*(e.g. Central waste collection)*
Mobility synergies	*Potential introduction of carpooling amongst co-workers. (e.g. Shared mobility)*
Other synergies	*N.A*

5. DECISION MAKING

a. Description of scenarios

NAME OF SCENARIO	DESCRIPTION
1. Waste Oriented. Recycle, reuse and reduce waste campaign and implementation	A recycle, reuse and reduce waste campaign to be implemented. Certain measures to be executed like: recycling bins all around the building, including all the offices, educating students and workers about reusing products instead of buying new, giving out free reusable water bottles and coffee cups to students (by finding willing sponsors to benefactor the products). Currently recycling bins can be found around campus in the public spaces and canteen area, however no recycling takes place inside the Faculty buildings.
2. Energy Oriented	The UM campus cannot be improved regarding renewable energy since all the roof space is currently already occupied by solar panels. However there is space for improvement for insulating the building envelope. Insulation boards can be installed on all external walls, internal walls and the roof. This would help to not waste energy for cooling during summer and heating during winter.
3. Water Oriented	Measures to conserve water can be easily implemented. Collection of greywater. The greywater treatment plant is to be situated at the institute of sustainable development which is being proposed as part of the extension of the university campus. The greywater will be collected from the ICT building and treated. The treated greywater will be supplied to the existing laboratories in the Chemistry Building, Biomedical Sciences Building, and to the proposed laboratories in the Medical School and Engineering Workshop. Moreover, it will also be supplied to the proposed residential area and the sustainable living complex. Due to the fact that the University of Malta Campus may be considered as a large scale application of greywater reuses, it is being proposed to discharge the greywater sources into a common collection point, from which it is then pumped into the treatment unit. Such water then undergoes several treatment procedures in the following sequence: Aerobic Screening, Chlorination.

b. Scenarios raking

i. Performance Scores

Issues	Current state	Scenario 1 (Waste Oriented)	Scenario 2 (Energy Oriented)	Scenario 3 (Water Oriented)
TOTAL SCORE				
A – Site regeneration	2.8	2.8	2.8	2.8
B – Energy and Resources C.	2.2	4	4	4
C – Environmental Loadings	3.6	3.6	3.6	4
D – Indoor Env. Quality	3.5	3.5	4	4
E – Service Quality	2.9	2.9	2.9	2.9
F – Social Aspects	1.2	2	1.2	1.2
G – Cost and Economic Asp.	3.8	3.8	4	4

ii. Key Performance Indicators

SCENARIO A- Waste Oriented			
KPI	**Indicator**	**Unit of measure**	**Value**
B.1.1 Primary energy demand	Primary energy demand per internal useful floor area per year	kWh/m2/yr	133.91
B.1.2 Delivered thermal energy demand	Delivered thermal energy demand per internal useful floor area per year	kWh/m2/yr	14.68
B.1.3 Delivered electric energy demand	Delivered electric energy demand per internal useful floor area per year	kWh/m2/yr	63.54
B.1.5 Energy from renewable sources in total final thermal energy consumption	Share of renewable energy in final thermal energy consumptions	%	/
B.1.6 Energy from renewable sources in total final electric energy consumption	Share of renewable energy in final electric energy consumption	%	25.20%
B.1.11 Embodied non-renewable primary energy	Embodied primary non-renewable energy	MJ/m^2	/
B.3.5 Recycled materials	Weight of recycled materials on total weight of materials	%	40

B.4.5 Potable water consumption for indoor uses	Potable water consumption per occupant per year	m^3/occupant/year	/
C.1.3 Global Warming potential	CO_2 equivalent emissions per internal useful floor area per year	kg CO_2 eq./m^2/yr	41.2
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	/
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	%	/
D.1.4 TVOC concentration in indoor air	TVOC concentration in indoor air	µg/ m^3	1474.4ppm
D.1.10 Ventilation rate	Ventilation rate normalized per useful floor area	l/s/m2	/
D.2.2 Thermal comfort index	Predicted Percentage Dissatisfied (PPD)	%	/
G.1.4 Use stage energy cost	Energy annual cost per usable floor area	€/m2/yr	/
G.1.5 Use stage water cost	Water annual cost per usable floor area	€/m2/yr	/

SCENARIO B: Energy Oriented			
KPI	**Indicator**	**Unit of measure**	**Value**
B.1.1 Primary energy demand	Primary energy demand per internal useful floor area per year	kWh/m2/yr	100
B.1.2 Delivered thermal energy demand	Delivered thermal energy demand per internal useful floor area per year	kWh/m2/yr	12
B.1.3 Delivered electric energy demand	Delivered electric energy demand per internal useful floor area per year	kWh/m2/yr	60
B.1.5 Energy from renewable sources in total final thermal energy consumption	Share of renewable energy in final thermal energy consumptions	%	/

B.1.6 Energy from renewable sources in total final electric energy consumption	Share of renewable energy in final electric energy consumption	%	40%
B.1.11 Embodied non-renewable primary energy	Embodied primary non-renewable energy	MJ/m^2	/
B.3.5 Recycled materials	Weight of recycled materials on total weight of materials	%	40
B.4.5 Potable water consumption for indoor uses	Potable water consumption per occupant per year	m^3/occupant/year	/
C.1.3 Global Warming potential	CO_2 equivalent emissions per internal useful floor area per year	kg CO_2 eq./m^2/yr	41.2
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	/
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	%	/
D.1.4 TVOC concentration in indoor air	TVOC concentration in indoor air	µg/ m^3	1474.4ppm
D.1.10 Ventilation rate	Ventilation rate normalized per useful floor area	l/s/m2	/
D.2.2 Thermal comfort index	Predicted Percentage Dissatisfied (PPD)	%	/
G.1.4 Use stage energy cost	Energy annual cost per usable floor area	€/m2/yr	/
G.1.5 Use stage water cost	Water annual cost per usable floor area	€/m2/yr	/

iii. Financing mechanisms evaluation

Scenario A: Waste	Finding willing sponsors to benefactor re-usable coffee cups, water bottles etc. Recycle bins can be financed through the University funds.
Scenario B: Energy	Financed through the University funds and also EU funds.
Scenario C: Water	Financed through the University funds and also EU funds.

iv. Synergies at building level

Scenario A: Waste	(1000 caracters)
Scenario B: Energy	(1000 caracters)
Scenario C: Water	(1000 caracters)

6. RETROFIT CONCEPT

SELECTED SCENARIO	DESCRIPTION
A. (i.e. Heat pump and solar panels)	Description

KEY ELEMENTS OF THE CONCEPT

Retrofits Strategies	Aspect 1
	Aspect 2
	Aspect 3
Performance improvement	Environment
	Society
	Economy
Financial mechanism	Aspect 1
	Aspect 2
	Aspect 3